

Supply and use tables - input-output analysis

Statistics Explained

A statistical and analytical tool for producing reliable national accounts and for impact analysis at European Union and national level

This article describes supply, use and input-output tables as they are constructed and used in the [European Union \(EU\)](#). Measuring production in an economy is essential in order to calculate [gross domestic product \(GDP\)](#). Vast amounts of information are needed to capture this process where input of labour, capital, goods and services results in produced outputs of goods and services. Statisticians and economists use a statistical and analytical framework called supply, use and input-output tables to organise this information.

Since 2011 consolidated European supply, use and input-output tables are available allowing macro-analysis.

Consolidated EU and euro area supply-use system and input-output tables

In May 2011 [Eurostat](#) has published for the first time ever a consolidated annual supply-use system and derived input-output tables for the European Union and the [euro area](#). These tables show at a glance the production and use of products distinguishing 59 industry branches and 59 product groups.

[Table 1](#) (downloadable Excel file) illustrates the data contained in the supply and use tables, aggregated to six product groups and six sectors.

Under the [European system of national and regional accounts \(ESA95\)](#), EU Member States transmit to Eurostat supply and use tables annually and input-output tables 5-yearly. For each Member State, the supply use tables (SUTs) at basic prices were estimated with the available supply use tables (at purchaser's prices) and (in part confidential) auxiliary valuation data. Due to confidentiality reasons, the supply-use tables at basic prices are published only at the level of [EU-27](#) and euro area.

The consolidated European tables result from the aggregation of national tables and a rebalancing treatment of the [intra-EU](#) (or intra-euro-area) [import](#) use total with the intra-EU (intra-euro-area) [export](#) supply totals.

The European tables published up to 2011 were using the [NACE](#) rev 1.1 classification. The [national accounts](#) domain as a whole has implemented the [NACE](#) rev 2. classification from the [reference year](#) 2008 onwards. Then end 2011, three years after the end of the reference year 2008 (regulatory transmission deadline), Member states started to transmit data in [NACE](#) rev 2. The requirement is to provide data from the year 2008 onwards. No backdata are mandatory. In October 2012, the first data in [NACE](#) Rev 2. classification has been published.

Statistical benefits

Supply and use tables serve primarily statistical purposes and provide an integrated framework for checking consistency and [completeness](#) of national accounts data.

In order to make GDP calculations more reliable, statisticians use three different methods: the production, the [income](#) and the [expenditure](#) approach; these three methods may generate different results. In order to eliminate

those differences and to find the most accurate result, statisticians often use supply-and-use tables as a balancing framework that reconciles the three methods of GDP estimation.

The supply and use tables provide the main macroeconomic aggregates such as GDP, components of [value added](#) and output by industry, import, final consumption, [gross capital formation](#) and export.

The supply table describes the supply of goods and services, which are either produced in the domestic industry or imported. The use table shows where and how goods and services are used in the economy. They can be used either in [intermediate consumption](#) — meaning in the production of something else — or in final use, which in turn is divided into consumption, gross capital formation and export. Furthermore the use table shows the income generated in the production process.

Concrete example: supply and use of cars

To make this concrete, imagine an economy with three industry sectors: agriculture, manufacturing and services, while for simplicity we follow only one product in our example: cars. These cars are either produced domestically or imported. That is a short description of the supply side.

The use table shows how the cars are used in the economy. Firstly there is intermediate consumption, which means that the cars are used in the production of another product. For example, when a car is transformed and sold as a camping car, then it has been used by the manufacturing industry.

Secondly there are different sorts of final use. When a car is sold to a consumer, then it has been used for final consumption. But when a car is sold to a catering firm or a farmer for professional use, it has been used as an investment (capital formation). Finally the car can be exported to another country. The sum of all these different uses should equal the total supply for each product. Since supply and use are recorded in monetary terms it is required that both are valued in the same way, either in basic prices or at purchasers' prices.

Figure 1 shows the supply and the use of the car industry within EU-27 in 2008.

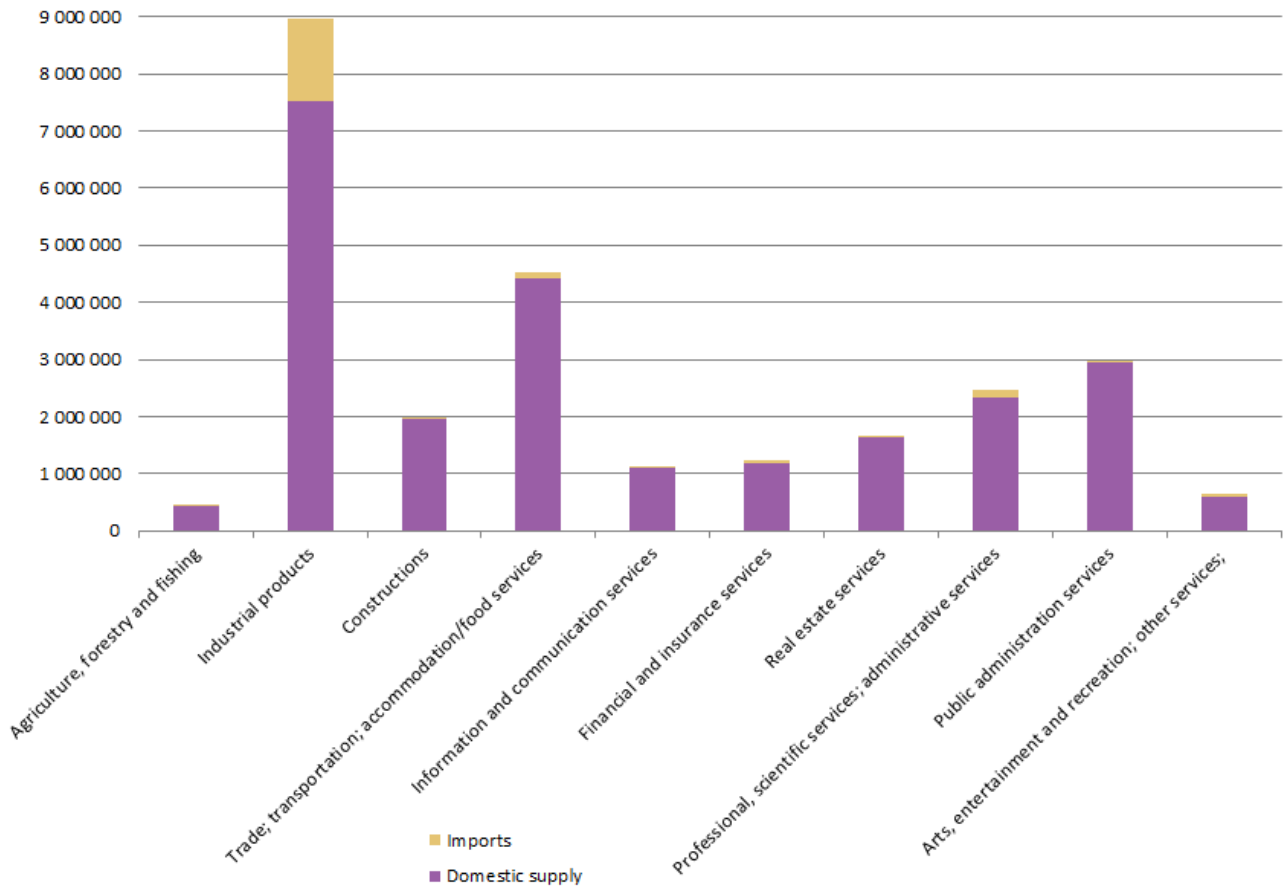


Figure 1: Supply by products, EU-27, 2008 - Source: Eurostat (naio_15_agg_60)

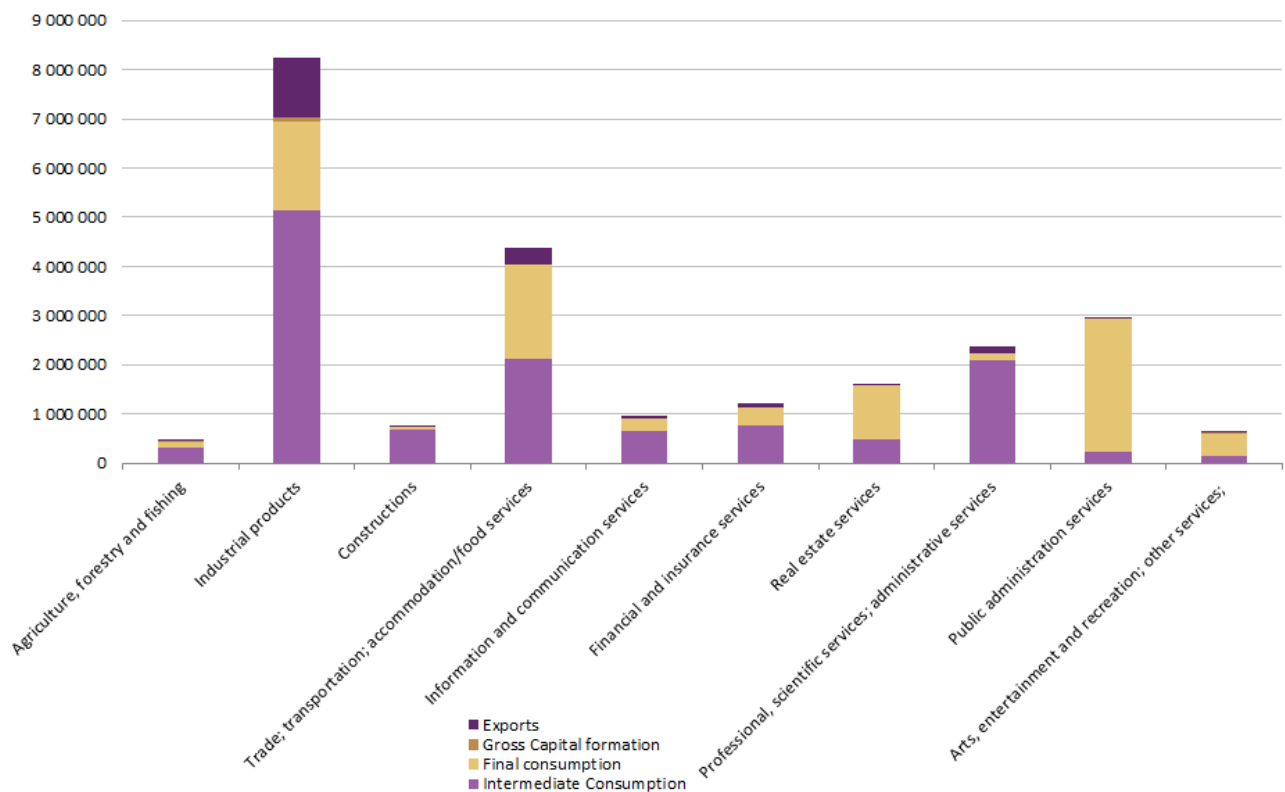


Figure 2: Use by products, EU-27, 2008 - Source: Eurostat (naio_15_agg_60)

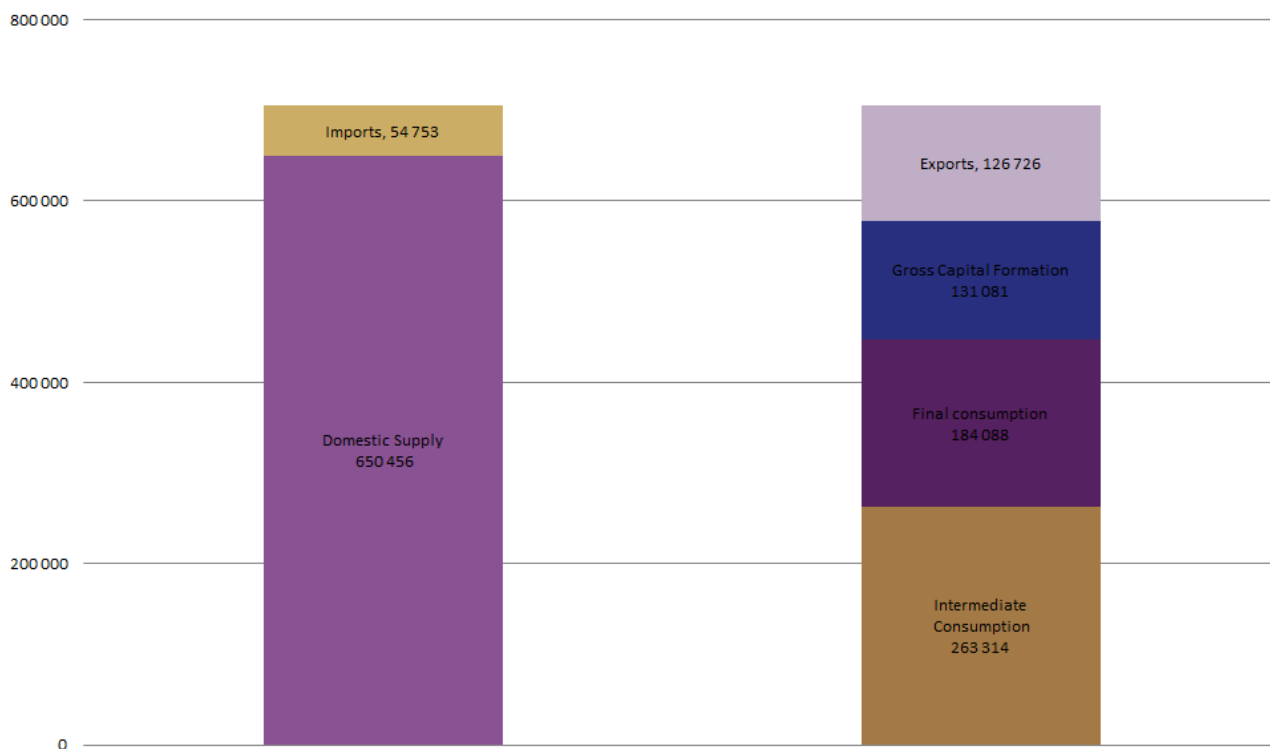


Figure 3: Production of cars (CPA29 motor vehicles, trailers and semi-trailers), EU-27, 2008, in millions of euro - Source: Eurostat (naio_15_agg_60)

Analysing the economy with input-output tables

The input-output analysis has been developed by the economist Wassily Leontief in the 1930s describing inter-industry relations in the economy. A product by product input-output table shows how much of each product is being used as input for the production of another product. Similarly, it also shows how much of each product is consumed by different user categories ([production](#) , [households](#) , [government](#) , [non-profit institutions serving households](#) , investment and foreign trade).

Example of input-output analysis

During the period 2000 to 2007 the production of exported manufactured products accounted annually on average for 68 % of the embodied employment in EU-27 exports. This annual average share rises to 71 % if the euro area countries are considered. Trade, hotels, restaurants and transport services amounted to nearly 20 % of the embodied employment and financial and real-estate services to around 9 % for the EU-27; the proportions were 18 % and 7 %, respectively, for the euro area countries. In 2007, manufactured products exported by the EU-27 employed directly and indirectly nearly 17 million persons, while trade, hotels, restaurants and transport services accounted for 5.6 million persons employed. The euro area required fewer persons for the production of its manufactured exports (around 16 million persons) and the exports of trade, hotels, restaurants and transport services (4.8 million persons). The total number of persons employed by firms engaged in exporting activities (directly and indirectly) in the euro area grew by an annual average rate of 2.6 % from 2000 to 2007 while for the EU-27 the figure was only 1.6 %. Financial and real-estate services contributed most to the increase in embodied employment in exports in both the euro area and the EU-27 (6.4 % and 6.0 % of annual average growth 2000-2007, respectively). They were followed by trade, hotels, restaurants and transport services with annual average growth rates of 4.8 % in the euro area and 3.7 % in the EU-27. During the same period, there were significant reductions in embodied employment in exported agricultural products (2.1 %) and other services including activities of households (-1.1 %) for the EU-27; for the euro area, these figures were still slightly positive, +0.6 % and +0.3 %, respectively.

11 % of EU jobs depend on exports

The input-output modelling permits, for instance, to answer the question of how many jobs depend on exports. As a

production factor input into industrial branches, labour is a significant component of GDP: in 2006 for EU-27 [compensation of employees](#) constituted 57 % of total value added ([Table 2](#)). Through the input-output table and a Leontief model, one can estimate that the exports of products outside the EU count for about 11 % of job-related income. In 2006 in EU-27, the public services (including health and social) and the construction were the first two sectors creators of jobs (see [article](#) this example was taken from).

Depending on which assumption on technology and sales structure is made, the supply and use tables can be transformed into symmetric input-output tables. At the European level, the consolidated EU-27 and euro area ([EA-17](#)) supply and use tables were subsequently transformed into symmetric product by product input-output tables (IOTs) using the so-called industry technology assumption (see Model B in [Eurostat Manual of Supply, Use and Input-Output Tables](#) , p. 349).

The product-by-product IOT for EU-27 is shown in [Table 2](#) (downloadable Excel file).

Extension to environmental accounts

Carbon dioxide emissions associated with EU consumption: 9 tonnes CO₂per capita in 2006

European input-output tables have been extended to the environmental accounts by modeling-estimations. The environmentally extended supply, use and input-output tables (EE-SUIOT) have been used to estimate the [CO₂emissions](#) induced by the final use of products within the EU (data on emissions of 7 other [gases](#) are also available). Beside the CO₂emissions emitted by EU industries in order to create products for final use, this estimate also takes into account CO₂emissions "embodied" in imports to the EU. The latter arise along the worldwide production chains of imported products. CO₂emissions "embodied" in products exported out of the EU go on the account of consumers abroad (see [full article](#)).

Other articles

- [National accounts - an overview](#) (background article)
- [National accounts and GDP](#)
- [System of national accounts - new directions](#) (background article)

Database

- [Supply, use and Input-output tables \(naio\)](#) , see:

Supply, use and Input-output tables - EU aggregates (naio_agg)

- [Environmental accounts](#)

Dedicated section

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

Publications

- [European exports 2000-2007: direct and indirect effects on employment and labour income in the EU 27 and euro area](#) Statistics in focus 36/2012
- [CO₂ emissions induced by EU's final use of products are estimated to be 9 tonnes per capita](#) - Statistics in focus 22/2011
- [The economy by numbers - Focus on national accounts](#) - - Sigma - The Bulletin of European Statistics, 03/2008

Methodology

- [Environmental accounts methodology](#)
- [Supply Use and Input-output tables' methodology](#)
- [Eurostat Manual of Supply, Use and Input-Output Tables](#)
- [Technical Documentation eeSUIOT project](#)

External links

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