

Session 5

Supply, Use and Input-Output Tables

The Use Table

Introduction

- A use table shows the use of goods and services by product and by type of use for intermediate consumption by industry, final consumption expenditure, gross capital formation or exports.
- The use table also shows the components of gross value added by industry for compensation of employees, other taxes less subsidies on production, consumption of fixed capital, and net operating surplus.
- The use table has two main objectives.
 1. Firstly, it reveals by column the input structure of each industry.
 2. Secondly, it describes in the rows the use of different products and primary inputs (labour and capital).
- The costs of production are shown in the columns of the use table for each industry.
- The total output of an industry at basic prices corresponds to the total output of an industry as reported in the supply table.
- In the use table, total output and value added are recorded at basic price.

Use table at purchaser's price

No	INDUSTRIES (NACE) PRODUCTS (CPA)	INPUT OF INDUSTRIES (NACE)						FINAL USES									Total use at purchasers' prices	
		Agriculture	Industry	Construction	Trade, hotel, transport	Private services	Other services	Total	Final consumption expenditure by households	Final consumption expenditure by non-profit organisations	Final consumption expenditure by government	Gross fixed capital formation	Changes in valuables	Changes in inventories	Exports intra EU fob	Exports extra EU fob		Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	Products of agriculture																	
2	Products of industry																	
3	Construction work																	
4	Trade, hotel, transport services																	
5	Private services																	
6	Other services																	
7	Total																	
8	Cif/ fob adjustments on exports																	
9	Direct purchases abroad by residents																	
10	Domestic purchases. by non-residents																	
11	Total																	
12	Compensation of employees																	
13	Other net taxes on production																	
14	Consumption of fixed capital																	
15	Operating surplus, net																	
16	Gross Value added at basic prices																	
17	Output at basic prices																	

■ = empty

- The intermediate consumption is shown by industry while final uses are broken down into final consumption expenditure, gross capital formation and exports.
- The section on **intermediate uses shows** the intermediate consumption of products by industries which are required to produce their output. These purchases constitute the intermediate consumption of industries.
- All uses of goods and services – intermediate consumption and final uses – are valued at purchasers' prices.
- Final consumption expenditure is broken down to final consumption expenditure by households, final consumption expenditure by non-profit institutions serving households (NPISH) and final consumption expenditure by government.
- The section on value added in the use table shows the costs of each industry in terms of factor costs for primary inputs, for example compensation of employees, other net taxes on production, consumption of fixed capital and net operating surplus.
- Gross capital formation contains separate columns for gross fixed capital formation, changes in valuables and changes in inventories.
- Exports of goods and services are reported in two separate columns for intra EU exports and extra EU exports.
- As all transactions of products are reported at purchasers' prices in the use table, the sum of each row is equal to the total use of a product at purchasers' price. For each product the total of use in the use table must be equal to the total of supply in the supply table.

The four important parts that a use table contains:

- Matrix of intermediate consumption at purchasers' prices
- Matrix of final demand at purchasers' prices
- Matrix of value added at basic prices
- Matrix of adjustment items
- In the submission programme, supplementary information is requested by industry on fixed capital formation, capital stock, and labour inputs. This information allows calculation of labour and capital productivity and total factor productivity for each industry.
- In the use table three additional rows are introduced in order to make up for the differences that result from different valuation methods applied in the input-output framework. The additional rows are:
 - i. CIF/FOB adjustments on exports
 - ii. Direct purchases abroad by residents
 - iii. Purchases on domestic territory by non-residents
- i. CIF/FOB adjustments on exports

- In the supply and use system imports and exports are valued FOB. However, data on detailed flows of imports from foreign trade statistics are most usually valued at CIF prices.
 - To reconcile the different valuations in use for total imports FOB and the imported products CIF, a global CIF/FOB adjustment row on imports is added to the supply table.
 - The same negative entries are shown in the CIF/FOB adjustment row for exports.
- ii. Direct purchases abroad by residents
- Direct purchases of residents abroad have to be treated as imports and thus included in total final consumption expenditure of households.
 - Thus an appropriate negative amount has to be entered in the imports column of the supply table and at the same time as negative entry in the column of final consumption expenditure of households in the use table.
- iii. Purchases on domestic territory by non-residents.
- Purchases on the domestic territory by non-residents are treated as exports and deducted from households' final consumption expenditure.
 - Thus the corresponding amount is entered in the exports column with a positive value and deducted with the same amount in the column of final consumption expenditure of households. The balance of the row is zero.
 - For a balanced supply and use system it is of great importance that full-size valuation matrices are available on trade and transport margins and taxes less subsidies on products for the transformation of the supply table from basic prices into purchasers' prices. For the use table at purchasers' prices it is as important that the following three disaggregate matrices are compiled:
 - Final consumption expenditure of households by purpose (COICOP)
 - Final consumption expenditure by government (COFOG)
 - Gross fixed capital formation by investing industries (Investment matrix)

Disaggregation of Use Table

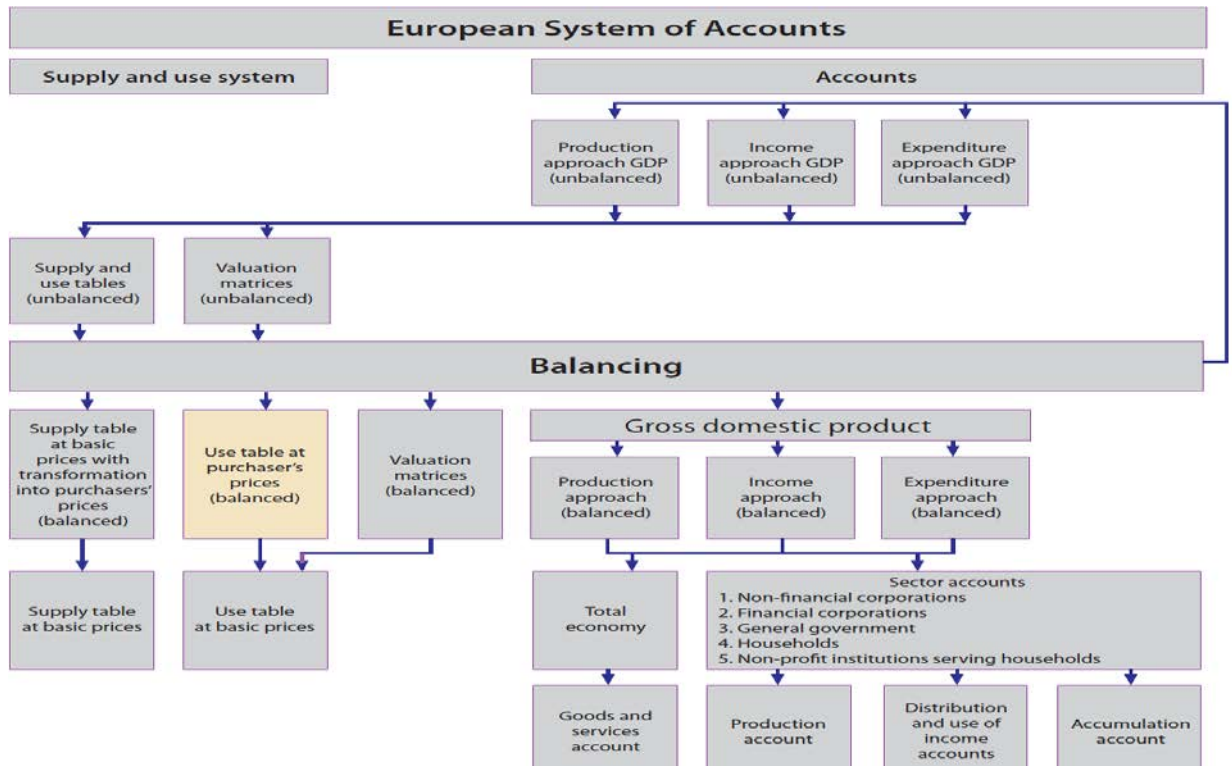
INDUSTRIES	INPUT OF INDUSTRIES				FINAL USES								Total use at number of industries
	Agriculture	Other services	Total	Final consumption by households	Final consumption by non-profit institutions	Final consumption by government	Gross fixed capital formation	Changes in valuables	Changes in inventories	Exports into EU	Exports to EU	Total	
No 1	1	59	60	61	62	63	64	65	66	67	68	69	70
Products of agriculture													
Other services													
Total													
CF/FOB adjustments exports													
Purchases abroad by residents													
Dom. purchases by non-residents													
Total													
Compensation of employees													
Other net taxes on production													
Consumption of fixed capital													
Operating surplus, net													
Value added at basic prices													
Output at basic prices													

Final consumption expenditure by households											
COICOP	CLASSIFICATION OF INDIVIDUAL CONSUMPTION BY PURPOSE										
	Food, beverages and tobacco	Clothing and footwear	Housing, water, electricity	Furnishings, household equipment	Health	Transport	Leisure, entertainment and culture	Education	Hotels, cafes and restaurants	Miscellaneous goods and services	Total
No 1	1	2	3	4	5	6	7	8	9	10	11
Products of agriculture											
Other services											
Total											

Final consumption expenditure by government											
COFOG	CLASSIFICATION OF THE FUNCTIONS OF GOVERNMENT										
	General public service	Defence affairs and services	Public order and safety affairs	Education affairs and services	Health affairs and services	Social security and welfare affairs	Housing and community amenity affairs	Recreational, cultural and religious affairs	Other economic affairs and services	Total	
No 1	1	2	3	4	5	6	7	8	14	15	
Products of agriculture											
Other services											
Total											

Gross fixed capital formation											
INDUSTRIES (NACE)	INVESTING INDUSTRIES										
	Agriculture, hunting	Forestry, logging	Fishing	Mining of coal and lignite	Extraction of crude oil and natural gas	Mining of uranium	Mining of metal ores	Other mining and quarrying	Private households	Total	
No 1	1	2	3	4	5	6	7	8	59	60	
Products of agriculture											
Other services											
Total											

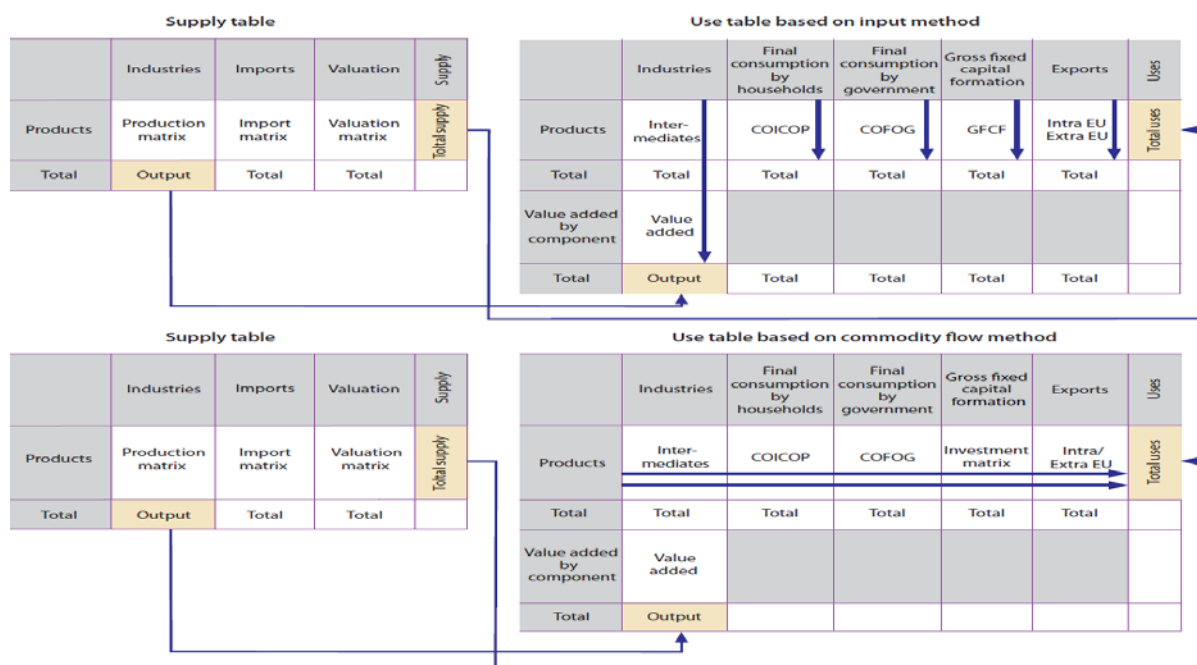
Compilation of the Use Table



- Figure demonstrates how the use table is integrated into the European System of Accounts.

- The main macroeconomic variables of the alternative GDP calculation according to the production approach, namely the income approach and the expenditure approach, are fully reflected in the supply and use tables.
- At the same time, the supply and use system is fully compatible with the sector accounts.
- Supply and use tables constitute the ideal framework for balancing the national accounts.
- Compiling the use table in practice depends a lot on the availability of detailed basic data for industries and categories of final demand.
- Therefore, the working procedures differ from country to country.
- For compiling use tables two general options are available:
 1. the input approach and
 2. the output approach.
- In the input approach the cost structures of industries and input structures of final demand categories are compiled on the basis of specific survey results, while in the output approach the allocation of goods and services is determined with the commodity-flow methodology.
- As the input approach is based on collected data it is the recommended approach for populating the tables. The output approach is an alternative and can provide a cross-check.

The two general approaches are presented in the figure.



- There is no absolute rule on deciding whether to give priority to columns or rows of a use table. It depends on basic surveys and specific country practices of national accounts.

- The main sources for the input approach are: Establishment Survey, Consumer Expenditure Survey, Government Expenditure Survey, and Capital Expenditure Survey.
- The main sources of the output approach are: Production Statistics and Foreign Trade Statistics.
- The following procedures will help to establish a fully integrated supply and use system for the national accounts:
- Production accounts

Establish a set of production accounts with output, intermediates and value added by product with the input approach and the output approach.

- Trade and transport margins

Calculate trade and transport margins for the production matrix.

- Other taxes less subsidies on products

Calculate other taxes less subsidies on products for the supply table. Other taxes on products do not include non-deductible value added tax (VAT).

- Final uses

Add the categories of final uses derived with the commodity-flow method to the use table.

- Non-deductible value added tax

Calculate a matrix of non-deductible VAT for the use table. It can only be compiled from the use side of the supply and use system.

- Balance the supply and use tables with the input approach and the commodity flow method.

The use table of the system gives information on the uses of goods and services and primary inputs but also on the cost structures of the industries.

1. The Input Approach

The Column Approach:

- The main sources for industry output estimates are production surveys and surveys of enterprises.
- Based on a business register or establishment census a sample should be drawn to conduct an annual establishment survey.
- The establishment survey should enquire the main and secondary activities of the establishment.
- It also should cover information on employment, output, intermediates and value added.

Data by Industry:

- Output, value added and intermediate purchase of industries are ascertained using annual enterprise surveys or fiscal data.

- The compilation of industry output and product output is an important task in the construction of the use and supply tables.

Products purchased by households:

- Data on household consumption may be derived from household budget surveys. Information from household budget surveys should be cross-checked with information from retail sales and other sources.
- The household budget survey is a survey of a representative random sample of all private households in a nation.
- The main purpose of the survey is to compile final consumption expenditure of households.

Investment by industries and by products:

- Investment by enterprises is derived from enterprise surveys.
- They provide information by economic sectors, and sometimes by main products (transport equipment, machinery, building, software) but not in great detail, making it easier to derive investment by institutional sector than by products.

Exports by Product

- International trade in services surveys and international passenger surveys will help to compile exports and imports of services.

2. The Output Approach

The row approach:

- The output approach is identical with the commodity-flow method.
- The identity between resources and uses of products requires that commodity flows by products can actually be compiled.
- The commodity flow methods as a general approach to national accounting is more developed in countries in which information of the input structure of industries is missing.

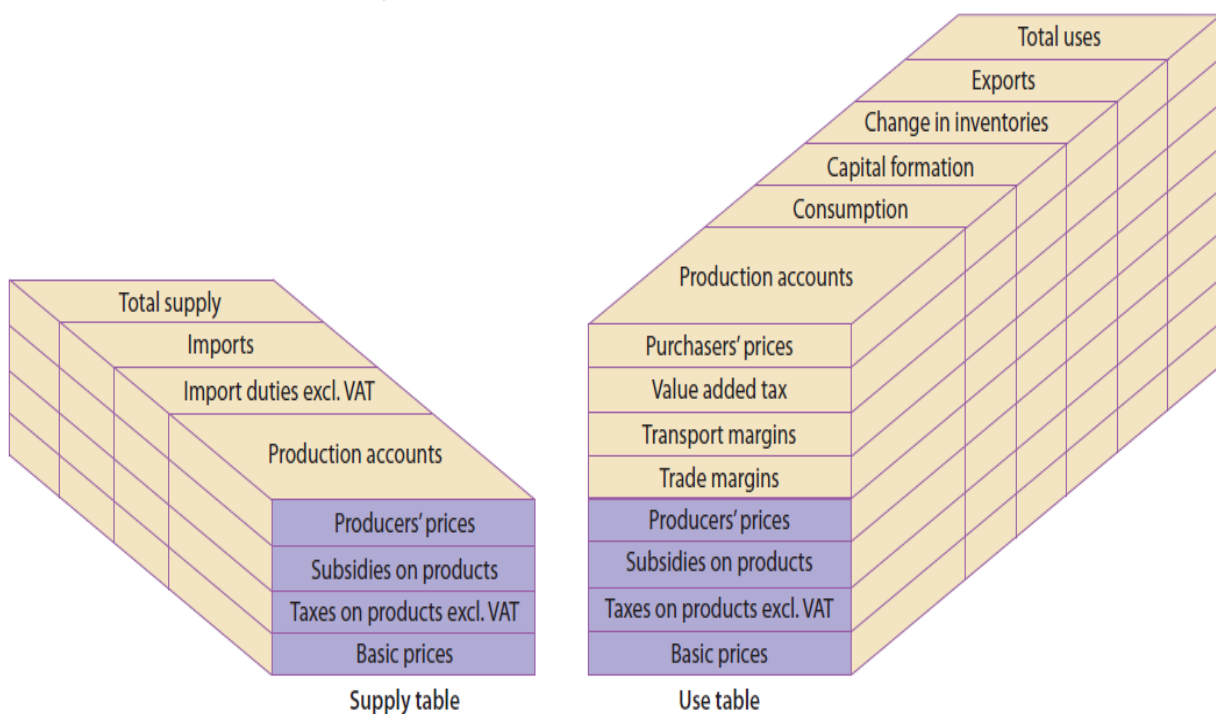
Commodity-flow method:

- Compiling detailed flows of goods and services is traditionally referred to as the commodity-flow method, utilising basic statistics on goods and services with the additional items required for the proper valuation.
- The full power of the commodity-flow method is reached when independent estimates could be made for each of the use items.
- In other words, the results of the commodity-flow method have to be verified by the main findings of the input method.
- To implement the commodity-flow method it is recommended to establish as a first step, a supply table at producers' prices.

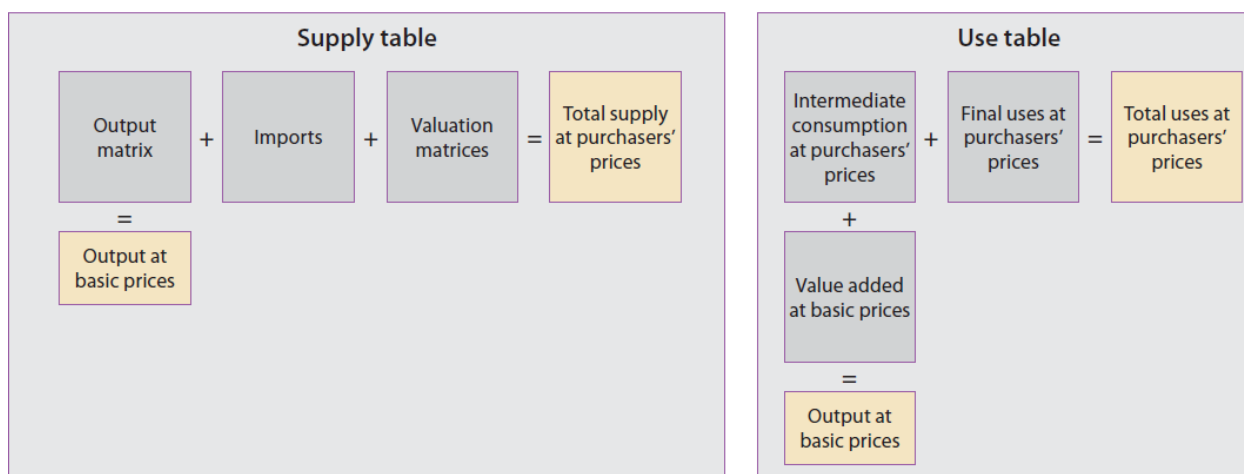
- This strategy has been implemented by Statistics Norway (Simpson 2005a).
- Producers' prices are not any longer an official valuation concept in SNA 1993 and ESA 1995.
- However, survey results indicate that it is easier to collect information from enterprises at producers' prices than at basic prices.
- In a second step taxes on products (excluding VAT) and subsidies on products are allocated to products and distributed between domestic suppliers and import of the products.
- Finally, the supply table at basic prices is calculated by deducting taxes less subsidies on products excluding VAT from supply at producers' prices.

Discuss the numerical example (Example 5.1)

Database for commodity flow method



Institutional sectors, industries and homogeneous production units



- The compilation of the use table is always linked with the compilation of the supply table. Provided supplies and uses are valued consistently, two types of identities hold between supply and uses tables:

1. Supply and demand

For each product the identity is given that supply equals demand. In the supply and use system, the total of each row in the supply table is equal to the corresponding row total in the use table.

Total supply by product at purchasers' prices = Total use by product at purchasers' prices

2. Input and output

For each industry the output is equal to its inputs. The column total of each column in the supply table equals the corresponding column total in the use table.

Total output by industry at basic prices = Total intermediate consumption at purchasers' prices + value added by industry.