

## Session 7

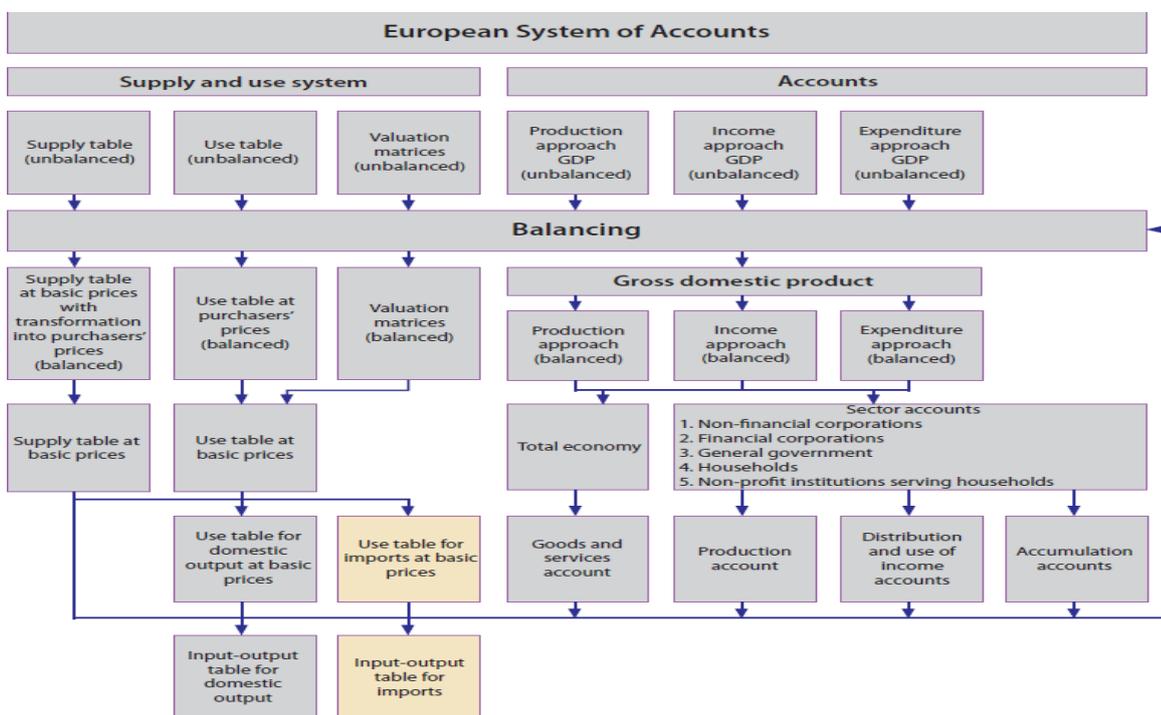
### Supply, Use and Input-Output Tables

#### Import Matrices Balancing Supply and Use

##### Introduction

- The supply of goods and services comprises the supply of domestic products and imported products. This session deals with estimating the use table for imports.
- It is compiled in order to separate the use of imported goods and services from the use of domestic goods and services.
- The intermediate use part of the import matrix shows the use of imported goods and services by product and industry in production.
- The final demand part of the import matrix shows the use of imported goods and services by categories of final use.

#### Compilation of Import Matrices



- The separation of domestically-produced and imported goods and services is of great importance for analytical purposes.
- This information is necessary for all types of analysis where the link between supply and use of domestic goods and services within the national economy plays a role.

- The input-output framework of the ESA 1995 therefore also contains a use table for imported products and a use table for domestically-produced goods and services as well as symmetric input output tables for domestic production and imports.
- The separation of imports of goods and services and domestically produced goods and services is of great importance not just for analytical purposes but also for balancing of the national accounts and for deflating GDP on the basis of supply and use tables.

### Imports in the supply and use framework

- Imports consist of purchases of goods and services by residents from non-residents. They include also barter, receipts of gifts or grants.
- In the system, total imports 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 valuation used for total imports and the product components of imports, a global CIF/FOB adjustment on imports is added.

### Use table for imports

PRODUCTS (CPA)	INDUSTRIES (NACE)							FINAL USES										
	Agriculture	Industry	Construction	Trade, hotel, transport	Finance, real estate, business	Other service activities	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	Total use at basic prices	
No	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
1 Products of agriculture	Imported products for intermediate consumption at c.i.f. values						Imported intermediates	Imported products for final uses at c.i.f. values									Imported final uses	Imported total uses
2 Products of industry																		
3 Construction work																		
4 Trade, hotel, transport																		
5 Financial, real, business																		
6 Other services																		
7 Total at basic prices	Intermediate consumption by industry							Final uses by category										

= Import vector of the supply table

- It distinguishes two main sub matrices, one for the intermediate use and one for the final uses of products.
- The total use of imports (column 17) must be equal to the total supply of imports as shown in the supply table.
- This equality is given for each of the products distinguished in the supply and use system.
- If the use table of imports is subtracted from the use table at purchasers' prices, the corresponding use table for domestic output can be derived which shows only domestic products.

- However, a further step is to subtract and reallocate the trade and transport margins and to deduct the taxes less subsidies on products in order to achieve the final supply and use system at basic prices.

### **Compilation of the use table of imports**

The general approach:

- Direct information on the use of imported goods and services by industries is usually only available in exceptional cases.
- In most cases the elaboration of this matrix needs to be based on some realistic assumptions and indirect estimation methods.
- This is also true for the final demand part of the use table.
- Only in cases where certain products are obviously only imported and not domestically produced can one directly draw a conclusion as to the respective use of these imports.

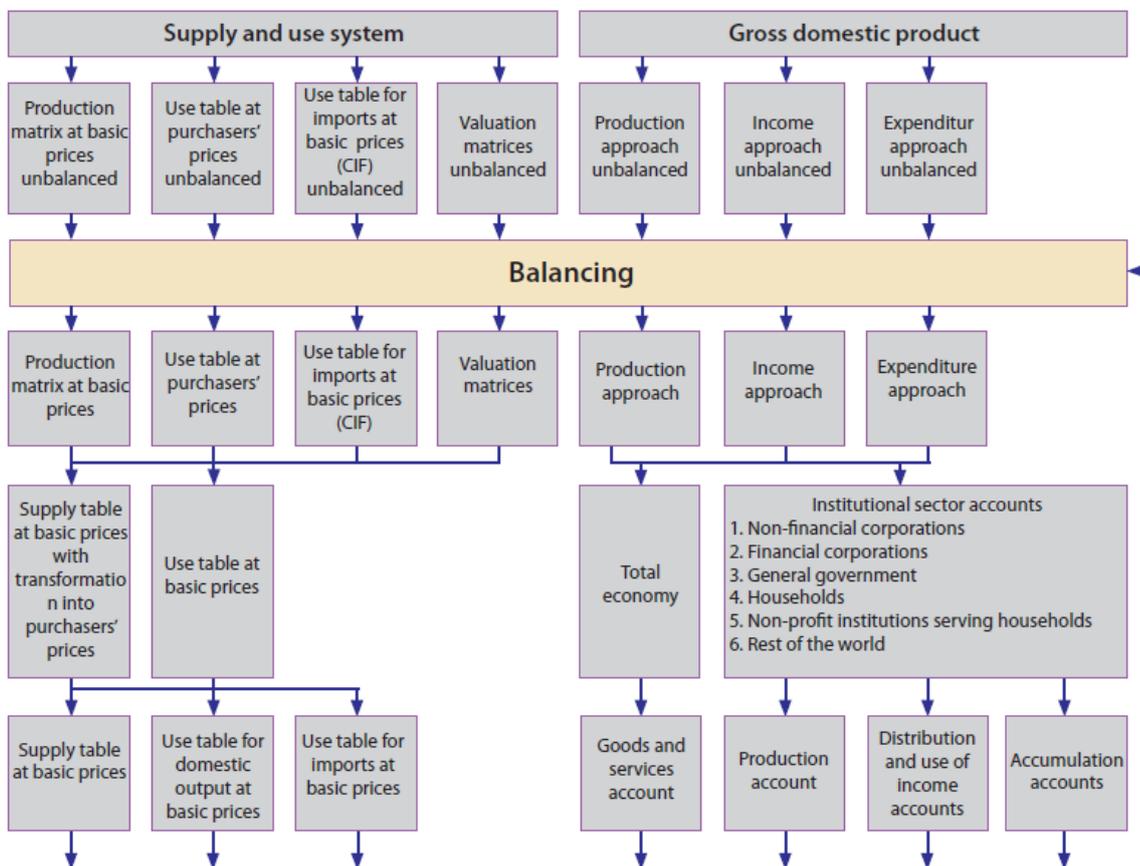
#### **Specific Issues**

- The first specific issue refers to products that have been exported for processing and the processed products are imported back into the economy.
- Both the export of materials or semi-processed goods and the import of finished products are part of the import and export flows according to the ESA 1995 definitions.
- The goods sent abroad become inputs into the foreign manufacturer's production process and the outputs from these processes will be received back, paying the manufacturer a fee for the production carried out.
- In such cases, the goods sent abroad lose their identity by being transformed or incorporated into other goods.
- A second issue refers to investment goods which are sent abroad for major repair. Again both the export and the re-import are part of the import and export flows.
- However, in case of minor repair, maintenance, or servicing, the flows concerned are not to be recorded under imports and exports. In case of major repairs, similar problems of recording in a supply and use framework do occur.
- Thus, for practical reasons one could assume that it usually would be only a minor repair.
- Furthermore, one could assume that cross-border transportation of investment goods for repair is quite exceptional and thus be negligible (with probably the exemption of aircraft and ships).
- A third issue concerns re-exports. Re-exports are transactions of goods which were imported and then exported without any transformation.
- Such cases do in practice also occur with products that are not produced domestically (e.g. Tropical fruits, automobiles).
- These re-exports are included as exports in foreign trade statistics without any marker.

- In cases of products that are not produced domestically, any exports of these products could easily be identified as re-exports.
- A specific issue which may also be of some importance concerning the data involved is the direct purchases abroad by residents in connection with tourism.
- These direct purchases abroad by residents should cover all purchases of goods and services made by residents while travelling abroad for business or pleasure.
- Such purchases are part of the import flows and need to be estimated on a product basis.
- Therefore, these purchases have to be allocated to intermediate use in case of business travellers and to household final consumption in the case of private travellers.

### Balancing Supply and Use

- **Balancing Supply and Use**



- The balancing starts with compiling preliminary estimates of all required inputs to assemble supply and use table at purchasers' prices and at basic prices. The required information contains:
  1. Production matrix at basic prices
  2. Use table at purchasers' prices
  3. Use table of imports at basic prices

- 4. Valuation matrices
- At the start of balancing an estimate is available for every entry of the supply table, the use table and the valuation matrices.
- All unbalanced matrices can be compiled from statistical sources supplemented by assumptions based on figures of the previous year.
- However, in most cases the use table for imports is usually based on a model that will be applied to the data after balancing the supply and use tables.
- In spite of all efforts it has to be expected that inconsistencies in the estimates remain.
- The differences can be caused by inaccuracies and inappropriate margins in the preceding estimates, errors in the specification items, non-observed changes of inventories and simply calculation errors. How can inconsistencies be detected and how can they be solved?
- For balancing no general theory or useful mathematical programs are available.
- However, in balancing it is very important to follow a systematic approach to solve the problems.
- Fortunately, a number of useful instruments are available in a supply and use system to tackle the problems.
- Basic identities, checks on plausibility and credibility, automatic procedures and error-search procedures help to solve the problems.

#### Basic Identities:

- A basic requirement for consistency is that basic identities for current and constant price values must be fulfilled.
- This is decisive for balancing in practice.
- Every difference between total supply (including margins and taxes) and total use (at current and constant prices) for any product points to an inconsistency.
- This observation is the starting point for going back to the data and analysing the problem in detail.

#### Check on Plausibility and Credibility:

- In the search for causes of the inconsistencies it can be helpful to carry out a number of credibility checks.
- In fact, this evaluation is a search for unexpected ratios among data.
- If something appears to be implausible, one has to look for an acceptable explanation by analysing the underlying sources and discussing the data with experts in the concerned area.
- Some of plausibility checks are,
  1. Products
  2. Industry

## Automatic procedures and error-search procedures

- Examples of balancing problems caused by errors in the sources are: insufficient coordination between data collected by the Central Bank and data collected by statistical offices, and differences in definitions and classifications.
- Examples of balancing problems caused by statistical offices are incorrect product classifications, incorrect grossing up of samples, and errors in transferring data or incorrect estimates for hidden transactions (the black and grey market).

### **An efficient way to organise balancing a supply and use system is a step-by-step procedure.**

First: select the large inconsistencies.

Second: carry out a critical search for results of data processed at the national accounts department. Especially in the use table, main items are the result of partitioning source data into product groups. The allocation may be changed without altering the original aggregates. In practice one will see that not all problems can be solved in this way.

The third step is to consult the expert knowledge of the statistician who is compiling the source statistics. If large inconsistencies still remain, a fourth step is to contact the reporting company for a critical discussion of the data they have provided.

Automation is essential for the preparation and management of the supply and use system. The computer plays different roles in the compilation process. A lot of calculations in the preparation stage are carried out by automatic procedures. In every stage of the process the computer provides quick and clear overviews of the data in every chosen configuration.