Session 6
Supply, Use and Input-Output Tables

The Valuation Matrices

Introduction

In the supply and use system, the valuation concepts constitute an important element.

Valuation concepts of product flows:

- Transactions are valued at the actual prices agreed upon by the transactors.
- Market prices are thus the basic reference for valuation in the supply and use system.
- In the absence of market transactions, valuation is made according to costs incurred (non-market services produced by government) or by reference to market prices for analogous goods and services (services of owner-occupied dwellings).

Valuation Concepts in the ESA 1995

ESA 1995 identifies two main valuation concepts of the goods and services.

1. Purchasers' prices:

At the time of purchase, the purchaser's price is the price the purchaser actually pays for the products; including any taxes less subsidies on the products (but excluding deductible taxes like VAT on the products); including any transport charges paid separately by the purchaser to take delivery at the required time and place.

2. Basic prices:

The basic price is the price receivable by the producer from the purchaser for a unit of a good or service produced as output minus any tax payable on that unit as a consequence of its production or sale (i.e. Taxes on products), plus any subsidy receivable on that unit as a consequence of its production or sale (i.e. subsidies on products). It excludes any transport charges invoiced separately by the producer. It includes any transport margins charged by the producer on the same invoice, even when they are included as a separate item on the invoice.

- The difference between these two basic valuation concepts relates therefore to trade and transport margins on the one hand, and to taxes less subsidies on products on the other.
- Producers' prices were the main valuation concept in the former system of national accounts. When we also introduce the concept of producers' prices, the difference between these two valuation concepts can be attributed to the two factors.

Producers' prices: The producers' price is the amount receivable by the producer from the purchaser for a unit of a good or service produced as output minus any VAT, invoiced to the purchaser. It excludes any transport charges invoiced separately by the producer.

- The relationship between the different types of prices

  Purchasers' prices (excluding any deductible VAT)

  - Non-deductible VAT

  - Trade and transport margins

  = Producers' prices

  - Taxes on products (excl. VAT)

  + Subsidies on products

  = Basic prices

However, the basic data which are used to compile the supply and use tables have different valuations:

- Production and output data are usually valued at basic prices or at producers' prices.
- Data on intermediate consumption and final use are usually valued at purchasers' prices.
- Imports are valued at CIF-prices.

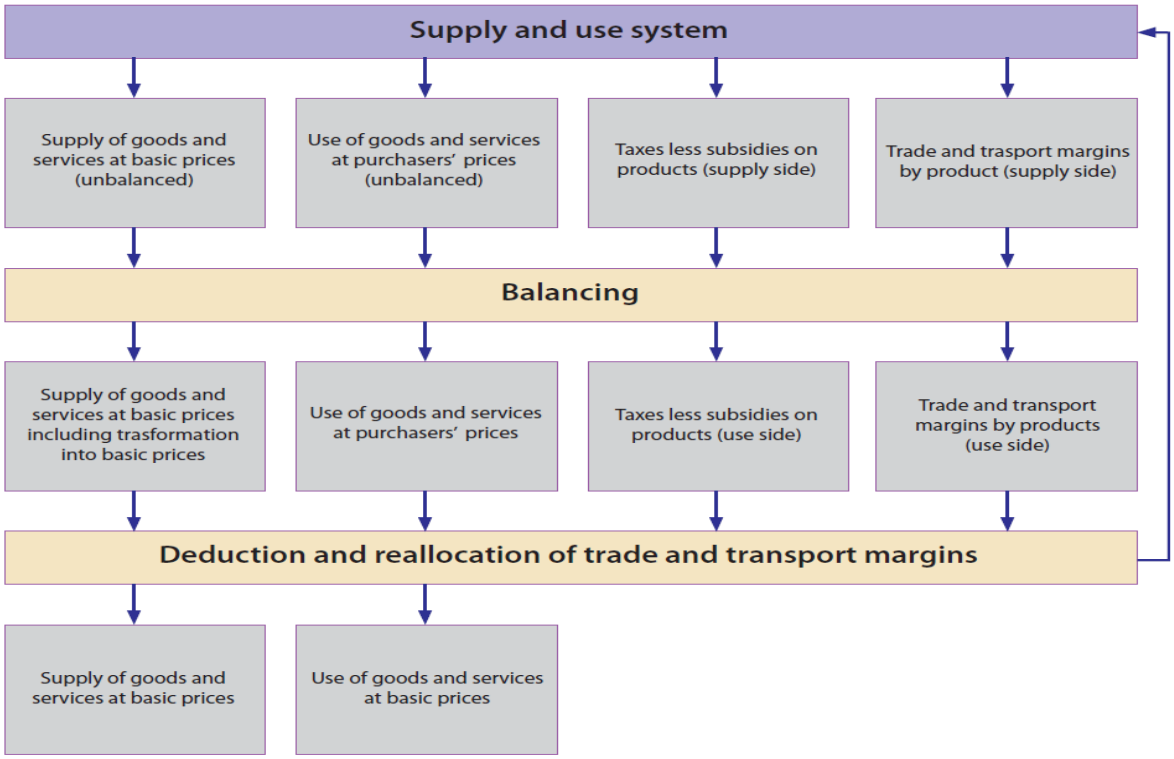
Price of a good delivered at the border of the importing country, or the price of a service delivered to a resident, before the payment of any import duties or other taxes on imports or trade and transport margins within the country.

- Exports are valued at FOB-prices.

Price of a good at the border of the exporting country, or the price of a service delivered to a non-resident, including transport charges and trade margins up to the point of the border, and including any taxes less subsidies on the goods exported.

- Without separating the different valuation components of the product flows, a supply and use framework cannot be balanced and made consistent.
- It is thus the task of the valuation matrices to bridge the differences between the valuation at purchasers' prices and the valuation at basic prices.
- The valuation matrices comprise all flows that are related to the supply and use of trade and transport margins and the supply and use of taxes less subsidies on products.
- On the supply-side, valuation matrices are needed to transform supply from basic prices to supply at purchasers' prices and thus to be able to balance supply and use at purchasers' prices.
- On the use-side, valuation matrices are required to transform the use data from purchasers' prices into basic prices.

Valuation matrices and their role in the compilation of supply – use framework



- At the supply side, data on the trade and transport margins by products as well as data on taxes less subsidies on products classified by homogeneous products are required.
- These valuation matrices are then added to total supply at basic prices resulting in total supply at purchasers' prices.
- This approach enables the balancing of supply and use at purchasers' prices.
- The second kind of valuation matrices relate to the trade and transport margins and taxes less subsidies on products incorporated in the use flows at purchasers' prices.
- The product totals of these use-side valuation matrices should, of course, be the same as the totals on the supply side.
- Deducting these use-side valuation matrices from the use data at purchasers' prices results in use data at basic prices.

The valuation matrices in the supply and use framework

- Valuation matrices comprise information on trade margins, transport margins, taxes on products and subsidies on products.
- Valuation matrices can be established for the supply side and the use side at the same time.
- In a balanced supply and use system the column totals of supply-side valuation matrices and use-side valuation matrices are equal.

1. Supply side valuation matrices

No	INDUSTRIES (NACE) / PRODUCTS (CPA)	OUTPUT OF INDUSTRIES (NACE)							IMPORTS				VALUATION		
		Agriculture	Industry	Construction	Trade, hotel, transport	Finance, real estate, business	Other service activities	Total domestic output at basic prices	Intra EU imports CIF	Extra EU imports CIF	Imports CIF	Total supply at basic prices	Trade and transport margins	Taxes less subsidies on products	Total supply at purchasers' prices
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Products of agriculture	6 467						6 467	1 039	874	1 912	8 380	1 903	- 262	10 021
2	Products of industry	889	111 350	626	2 749	62	248	115 925	48 544	24 269	72 812	188 737	36 181	15 988	240 906
3	Construction work	140	1 132	27 356	429	36	67	29 161	217	143	360	29 521		1 704	31 225
4	Trade, hotel, transport services	150	3 375	399	79 355	447	439	84 164	2 044	1 512	3 557	87 721	- 38 085	1 696	51 332
5	Financial, real estate, business	13	1 428	211	1 953	66 939	416	70 961	3 580	1 493	5 073	76 033		2 722	78 756
6	Other services	4	58	5	200	2	55 843	56 112	559	281	840	56 952		850	57 802
7	Total	7 663	117 344	28 597	84 686	67 486	57 013	362 790	55 983	28 571	84 554	447 344	0	22 699	470 043
8	CIF/FOB adjustments on imports								- 133	- 30	- 163	- 163			- 163
9	Direct purchases abroad by residents								4 997	3 160	8 157	8 157			8 157
10	Total	7 663	117 344	28 597	84 686	67 486	57 013	362 790	60 847	31 701	92 548	455 338	0	22 699	478 037

- The table shows the structure of supply at basic prices, including a transformation into purchasers' prices.
- The left part of this table starts with the domestic output of the various industries showing the products produced by them, valued at basic prices.
- In the supply table, trade and transport margins are reported in row (4) for total supply at basic prices.
- To arrive at purchasers' prices for each product, trade margins and transport margins have to be reallocated from trade and transport services to the traded products.
- In column (12) of the supply table, a new allocation of trade and transport margins is realised with positive entries (+) in the rows of the traded and transported products and negative entries (-) in the rows of trade services and transport services. The total of column (12) of trade and transport margins is always zero.
- The inclusion of the imports CIF by products results in the total supply by products at basic prices (column 11).
- In order to compile trade and transport margins by products in column (12), the elaboration of additional sub matrices is necessary which reflect supply-side trade and transport margin matrices. The structure of these matrices is shown in Table.
- The column totals of this matrix are then entered in column (12) of the supply table.

	INDUSTRIES (NACE) / PRODUCTS (CPA)	INDUSTRIES (NACE)						Total
		Agriculture	Industry	Construction	Trade, hotel, transport	Finance, real estate, business	Other service activities	
No		1	2	3	4	5	6	7
1	Products of agriculture	1 903						1 903
2	Products of industry	278	34 753	195	858	19	77	36 181
3	Construction work							
4	Trade, hotel, transport services	- 2 181	- 34 753	- 195	- 858	- 19	- 77	- 38 085
5	Financial, real estate, business							
6	Other services							
7	Total	0	0	0	0	0	0	0

Use side valuation matrices

The table shows the structure of the use table at purchasers' prices.

	INDUSTRIES (NACE) / PRODUCTS (CPA)	INPUT OF INDUSTRIES (NACE)							FINAL USES									Total use at purchasers' prices
		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	Exportsextra EU FOB	Total	
No		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	Products of agriculture	1 705	4 104	30	482	11	95	6 426	2 561		176	108		242	397	112	3 595	10 021
2	Products of industry	1 678	55 020	9 212	14 043	3 701	7 730	1 384	55 434		2 111	22 231	163	792	42 232	26 561	149 522	240 906
3	Construction work	99	542	1 993	950	3 695	1 445	8 724	1 032			20 761			429	280	22 501	31 225
4	Trade, hotel, transport services	83	4 420	401	11 129	1 321	1 493	18 847	26 586		328	67			3 285	2 223	32 488	51 334
5	Financial, real estate, business services	171	7 400	1 732	10 490	21 810	4 618	46 221	22 156		195	4 254		- 24	3 606	2 345	32 533	78 754
6	Other services	102	1 323	77	813	1 682	3 052	7 049	9 507	3 670	36 988	251	61		187	90	50 753	57 802
7	Total at purchasers' prices	3 837	72 808	13 445	37 907	32 221	18 433	178 652	117 274	3 670	39 797	47 672	224	1 009	50 135	31 611	291 392	470 043
8	CIF/FOB adjustments on exports														- 133	- 30	- 163	- 163
9	Direct purchases abroad by residents								8 157								8 157	8 157
10	Domestic purchases. by non-residents								- 12 360						9 528	2 832		
11	Total	3 837	72 808	13 445	37 907	32 221	18 433	178 652	113 071	3 670	39 797	47 672	224	1 009	59 530	34 413	299 386	478 037
12	Compensation of employees	504	25 517	8 298	26 129	14 458	32 269	107 174										
13	Other net taxes on production	- 906	908	345	981	883	810	3 021										
14	Consumption of fixed capital	1 520	6 407	1 007	6 634	9 363	4 642	29 574										
15	Operating surplus, net	2 709	11 705	5 501	13 036	10 561	859	4 370										
16	Value added at basic prices	3 826	44 536	15 152	46 779	35 265	38 580	184 138										
17	Output at basic prices	7 663	117 344	28 597	84 686	67 486	57 013	362 790										

- This table comprises three sub matrices: the intermediate consumption matrix showing intermediate consumption by industries and products,

  the final uses matrix showing final uses by types and products,

  and the value added matrix showing the components of value added by industries.

- Both the intermediate consumption and the final uses matrix are valued at purchasers' prices, thus including trade and transport margins and including product taxes less subsidies.

- The transition of the use table from purchasers' prices into basic prices involves the elaboration of use-side trade and transport margin matrices and of use-side matrices of product taxes less subsidies.
- Use-side trade and transport margin matrix has the same dimensions as the intermediate consumption and final uses matrix at purchasers' prices.
- It shows the allocation of the trade and transport margins for each product to each element of the use table at purchasers' prices.
- Hence, it tells how much trade and transport margins are included in the purchasers' price or, in other words, which amounts need to be deducted from the purchasers' price in order to achieve the valuation of basic prices, if similarly, product taxes less subsidies are also deducted.
- Having elaborated Use-side trade and transport margin matrix , the next step is to deduct the trade and transport margins from each single entry in the use table.
- Furthermore, it is necessary to reallocate the deducted trade and transport margins to the specific trade and transport service products distinguished in the product classification applied.
- Similarly, a use-side matrix on product taxes less subsides also has to be estimated. The layout of this table is equal to that
- of the use-side trade and transport margin matrix . This table shows the amount of product taxes less subsidies included in the purchasers' price.
- For the estimation of these data, the relations between the value or the physical quantity and the tax rate of the specific product will have to be used.
- The taxes less subsidies on products allocated at the use-side to be deducted from the purchasers' prices must be equal to the taxes less subsidies on products received by the government and measured on an accrual basis.

(Example 6.1)

- The estimation of the trade and transport margins is an important step in the compilation of supply and use tables.
- The data situation for compiling the valuation matrices is often quite poor.
- Thus, plausible assumptions have to be made.
- Also, it might be advisable to make benchmark estimates for a year with a favourable data situation which then could be used for subsequent years.

Trade Margins

- Wholesalers and retailers actually buy and sell goods. However, the goods purchased are not treated as part of their intermediate consumption in case they are resold with only minimal processing such as grading, cleaning and packaging.
- Wholesalers and retailers are treated as supplying services. Their output is measured by the total value of the trade margins realised on the goods they purchase for resale.

The ESA 1995 defines a trade margin as:

"A trade margin is the difference between the actual or imputed price realised on a good purchased for resale and the price that would have to be paid by the distributor to replace the good at the time it is sold or otherwise disposed of. By convention, holding gains and losses are not included in the trade margin. However, in practice, data sources may not allow to separate out all the holding gains and losses. Trade margins are valued at basic prices."

- In practice, trade margins are derived as the difference between the trading sales and the costs of goods purchased for resale adjusted by changes in stocks (if possible, adjusted by holding gains and losses):

  Trade sales (at basic prices)

  - Costs of goods purchased for resale (at purchasers' prices)

  - Trading stock at the beginning of the period (at purchasers' prices)

  + Trading stock at the end of the period (at purchasers' prices)

  = Trade margin (at basic prices)

- In order to derive trade margins, either for single goods, industries or the total economy, data on trading sales (trade turnover), data on goods purchased for resale and trading stock at the beginning and at the end of the period must be available.

- Usually, structural business statistics or specific trade surveys do deliver such data at the level of industries. However, trading is also an important secondary activity of nearly all industries.

- Trading activities in the system are measured by trade margins, regardless whether done by traders as their main activity or by other industries as part of their secondary outputs.

Compilation of trade margin matrices

- Some countries collect data from annual business surveys covering margins by type of product earned by wholesalers, retailers and motor traders, and the total purchases and sales of traded goods and services for all other industries.

- However, in many cases trade margins for products are not available from surveys.

- Due to availability of data sources, one might start the compilation of the trade margin matrices either from the supply side or from the use side.

Transport Margins

- Aside from the trade margins, transport margins are another valuation component relating to the delivery chain of the products from the producer to the final user.

- Transport margins represent freight transportation services of products when invoiced separately by the seller. Transport margins are defined as follows:

"Transport margins are the transport costs for transportation of products paid separately by the purchaser and included in the use of products at purchasers' prices but not in the basic price of a manufacturers' output or in the trade margins of wholesalers or retail traders."

Such transport margins include in particular:

- transport of goods from the place where it is manufactured or sold to the place where the purchaser takes delivery of it in case the manufacturer or trader pays a third party for the transport, if this amount is invoiced separately to the purchaser;
- transport of goods arranged by the manufacturer or by the wholesale or retail trader in such a way that the purchaser has to pay separately for the transport costs even when the transport is done by the manufacturer or the wholesale or retail trader himself.

Compilation of Transport Margin Matrices

- Supply Side transport margins
- Use Side transport margins

Taxes and subsidies on products

- A tax on a product is a tax that is payable per unit of some good or services.
- The tax may be a specific amount of money per unit of quantity of a goods or services (e.g. mineral oil tax), or it may be calculated ad valorem as a specified percentage of the price per unit of value of the goods and services transacted (e.g. value added tax).
- A subsidy on a product is a subsidy payable per unit of output of a good or service.
- The subsidy may be a specific amount of money per unit of quantity of the good or services, or it may be calculated ad valorem as a specific percentage of the price per unit.

Compilation of product tax and subsidy matrix

- The first compilation requirement refers to the column (13) vector of supply table at basic prices.
- The product taxes less product subsidies are shown by products.
- This step necessitates classifying the different product taxes/subsidies according to the product classification used. appropriate more detailed level of the classification in use.
- The same has to be done for the product subsidies.
- The second compilation step with respect to the product taxes and subsidies refers to the allocation of the product taxes and subsidies at the use side (intermediate use and final uses) at purchasers' prices.