

The Present and Future Data Situation in EU Countries for INFORUM Modelling

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1. Introduction and background

Empirically INFORUM modelling is based on the available statistical data. Input-output (IO) tables and national accounts are of particular importance. The availability and the access to this data are limiting factors for all modelling activities.

In the European Union (EU) the compilation of statistical data is to a high degree standardized and regulated. Statistics is not longer primarily viewed as a scientific discipline in order to provide a well organized perception of reality. Statistics has to play a direct operational role. This statement holds in particular for national accounts. National accounts results are directly used for many administrative purposes. Examples are:

- basis for the budget of the Commission
- basis for the financial contributions of the member states to the EU budget
- basis for the definition of criteria for regional policies
- providing criteria for the pact for stability and growth

Because of this role there is an obvious need for strong harmonization, a legal framework, regulations governing statistics and strict control by the European Commission. Little room is left for alternative concepts and because of budget restrictions additional projects in the Statistical Offices.

On the other hand the data situation in the countries of the EU is quite similar. INFORUM modelling is confronted with more or less the same statistical environment in all the member countries. Therefore it seems worthwhile to discuss the present situation and to give some information on developments which are already “in the pipeline”.

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2. The present situation

2.1 ESA 95

In the European System of National Accounts (COUNCIL REGULATION (EC) No 2223/96 of 25 June 1996 on the European system of national and regional accounts in the Community) an entire chapter (Chapter 9) is devoted to the Input-Output Framework.

The most relevant paragraphs of the ESA Regulation (excerpts and abridged) are:

GENERAL FEATURES

1.01. The European System of National and Regional Accounts (ESA) is an internationally compatible accounting framework for a systematic and detailed description of a total economy (that is a region, country or group of countries), its components and its relations with other total economies.

The ESA can therefore serve as the central framework of reference for the social and economic statistics of the European Union and its Member States.

1.02. The ESA framework consists of two main sets of tables:

(a) the sector accounts (1);

(b) the input-output framework (2) and the accounts by industry (3).

The sector accounts provide, by institutional sector, a systematic description of the different stages of the economic process: production, generation of income, distribution of income, redistribution of income, use of income and financial and non-financial accumulation. The sector accounts also include balance sheets to describe the stocks of assets, liabilities and net worth at the beginning and the end of the accounting period.

The input-output framework and the accounts by industry describe in more detail the production process (cost structure, income generated and employment) and the flows of goods and services (output, imports, exports, final consumption, intermediate consumption and capital formation by product group).

The ESA encompasses concepts of population and employment (4). These concepts are relevant for both the sector accounts and the input-output framework.

INPUT-OUTPUT FRAMEWORK

9.01. The input-output framework consists of three types of tables:

(a) supply and use tables;

(b) tables linking the supply and use tables to the sector accounts;

(c) symmetric input-output tables.

9.06. Supply and use tables are the central framework for all tables by industry, e.g. those on employment, gross fixed capital formation and capital stock.

9.07. The supply and use tables contain all the flows in the following accounts:

(a) the goods and services account;

(b) the production account;

(c) the generation of income account.

9.09. A symmetric input-output table is a product by product or industry by industry matrix describing the domestic production processes and the transactions in products of the national economy in great detail.

9.10. *The format of the supply and use tables is designed to fit in with this type of statistical information (i.e. industry by product). By contrast, information of a product by product or industry by industry nature as required by the symmetric input-output table is not often available. The industry by product information in the supply and use tables can be converted into product by product or industry by industry statistics by adding extra statistical information on the input structures or by assuming constant input structures by product or by industry (see paragraphs 9.54-9.60).*

9.11. *The supply and use tables serve both statistical and analytical purposes.*

Important statistical purposes are:

- (a) identifying gaps and inconsistencies in basic data sources;*
- (b) weighting and calculation of index numbers and price and volume measures;*
- (c) making estimates by residual (estimating a variable by first estimating all other variables in the identity), e.g. for the production or final consumption of specific products;*
- (d) checking and improving the consistency, plausibility and completeness of figures in the supply and use tables and the derived figures (such as those in the production accounts). To this end, the balancing process should not be limited to the supply and use tables at current prices.*

9.13. *The supply and use tables and symmetric input-output tables can also be used as tools of economic analysis. Both types of tables have different merits. For calculating direct and indirect effects, the supply and use tables need to be accommodated with specific assumptions or extra statistical information. For calculating cumulative effects, these assumptions and extra data requirements are the strongest. In fact, the requirements for calculating cumulative effects with a supply and use table amount to constructing a symmetric input-output table. Therefore, for calculating cumulative effects, the symmetric input-output table is the preferable tool. However, for calculating direct effects and first-order effects, the supply and use tables adjusted with a selected amount of assumptions (or extra statistical information) is in general to be preferred, because:*

- (a) the calculation is less dependent on assumptions;*
- (b) the supply and use table provides more detail than the symmetric input-output table;*
- (c) the information in the supply and use table can be better linked to other types of statistical data. These features are also helpful when the supply and use tables are integrated in a macro-economic model: the resulting overall model is closer to real statistics, can show a lot of detail and can relatively easily be linked to areas on which other statistical data are available, e.g. on the labour market or the environment.*

9.15. *The supply and use tables and the symmetric input-output table can be integrated into macro-economic models to provide the latter with a detailed meso-economic foundation.*

TABLES LINKING THE SUPPLY AND USE TABLES TO THE SECTOR ACCOUNTS

9.52. *The information in the supply and use tables should be linked to the sector accounts, to ensure that the supply and use table is consistent with the sector accounts. This is achieved by introducing a table with variables cross-classified by industry and by sector*

SYMMETRIC INPUT-OUTPUT TABLES

9.53. *In the ESA, the product-by-product input-output table is the most important symmetric input-output table and this table is described here.*

9.54. *The product-by-product input-output table (see tables 9.4 and 9.12) can be compiled by converting the supply and use tables, both at basic prices. This involves a change in format, i.e. from two asymmetric tables to one symmetric table (see paragraph 9.09). The conversion can be divided into three steps:*

- (a) allocation of secondary products in the supply table to the industries of which they are the principal products;*

(b) rearrangement of the columns of the use table from inputs into industries to inputs into homogeneous branches (without aggregation of the rows);
(c) aggregation of the detailed products (rows) of the new use table to the homogeneous branches shown in the columns, if appropriate.

9.55. Step (a) involves transfers of outputs in the form of secondary products in the supply table. Since secondary products appear as 'off-diagonal' entries in the supply table, this kind of transfer is a comparatively simple matter. These secondary products are treated as additions into the industries for which they are principal and removed from the industries in which they were produced.

9.56. Step (b) is more complicated, as the basic data on inputs relate to industries and not to each individual product produced by each industry. The kind of conversion to be made here entails the transfer of inputs associated with secondary outputs from the industry in which that secondary output has been produced to the industry to which they principally (characteristically) belong. In making this transfer, two different approaches might be taken:

1. by means of supplementary statistical and technical information;
2. by means of assumptions.

9.57. Supplementary statistical and technical information should be utilized as much as possible. For example, it might be possible to obtain specific information on the inputs required to produce certain kinds of output. However, information of this kind is usually incomplete. Ultimately it will usually be necessary to resort to simple assumptions to make the transfers.

9.61. The classifications in the symmetric input-output table coincide with those in the supply and use tables, as the former is a transformation of the latter (except of course the classification by industry/homogeneous branch).

9.62. The symmetric input-output table 9.12 should be accompanied by at least two tables:
(a) a matrix showing the use of imports; the format of this table is the same as that of the import table supporting the supply and use tables (see table 9.10), except that the product-by-product classification is used; (b) a symmetric input-output table for domestic output (table 9.13).

The latter table should be used in calculating the cumulated coefficients, i.e. the Leontief-inverse. In terms of table 9.13, the Leontief-inverse is the inverse of the difference between the identity matrix I and the matrix of technical coefficients obtained from the matrix $((I), (I))$. The Leontief-inverse could also have been calculated for domestic output and competitive imports (see paragraph 9.51). It should then be assumed that the competitive imports have been produced in the same way as the competing domestic produce.

2.2 Transmission of results

European legislation does not only define all the standards and concepts in very great detail, it also regulates which data in which classification has to be delivered to EUROSTAT at which date. The advantage of this situation for the user is, that he knows well in advance which data of which kind he can expect.

The Council Regulation governing the time schedule for the transmission of national accounts data was changed only recently. The Regulation has 22 pages, 17 of them are devoted to derogations. Supply tables at producer prices and use tables at purchasers' prices have to be produced annually, symmetric tables and cross classifications of production account by industry and by sector five yearly.

Almost all the national accounts aggregates have to be provided at current and constant prices, this regulation also applies to the annual transmission of supply and use tables.

REGULATION (EC) No 1267/2003 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL
of 16 June 2003

amending Council Regulation (EC) No 2223/96 with respect to the time limit for transmission of the main aggregates of national accounts, to the derogations concerning the transmission of the main aggregates of national accounts and to the transmission of employment data in hours worked

(Text with EEA relevance)

ANNEX I

Amendments to the table 'Overview of the tables' of Annex B — Transmission Programme of National Accounts Data — of Regulation (EC) No 2223/96, (ESA 95)

TRANSMISSION PROGRAMME OF NATIONAL ACCOUNTS DATA

Overview of the tables

First transmission	Delay t + month (days where specified)	Transmission for years	Subject of the tables	Table No
2002	70 days	1995-2001	Main aggregates, annual	1
2002	70 days	1995-2001	Main aggregates, quarterly	1
1999	8	1995-1998	Main aggregates general government	2
2001	3	1997-2000	Main aggregates general government	2'
2000	9	1995-1999	Tables by industry	3
2000	9	1995-1999	Exports and imports by EU/third countries	4
2000	9	1995-1999	Household final consumption expenditure by purpose	5
2000	9	1995-1999	Financial accounts by sector (transactions)	6
2000	9	1995-1999	Balance sheets for financial assets and liabilities	7
2000	12	1995-1999	Non-financial accounts by sector	8
2000	12	1995-1999	Detailed tax receipts by sector	9
2000	24	1995-1998	Tables by industry and by region, NUTS II, A17	10
2001	12	1995-2000	General government expenditure by function	11
2001	24	1995-1999	Tables by industry and by region, NUTS III, A3	12
2001	24	1995-1999	Household accounts by region, NUTS II	13
2001	24	1995-1999	Fixed assets for total economy and by product (Pi3)	14
2002	36	1995-1999	Supply table at basic prices including transformation into purchasers' prices, A60 × P60	15
2002	36	1995-1999	Use table at purchasers' prices, A60 × P60	16
2002	36	1995 (*)	Symmetric input-output table at basic prices, P60 × P60, five yearly	17
2002	36	1995 (*)	Symmetric input-output table for domestic output at basic prices, P60 × P60, five yearly	18
2002	36	1995 (*)	Symmetric input-output table for imports at basic prices P60 × P60, five yearly	19
2003	36	2000	Gross classification of fixed assets by industry and by product, A31 × Pi3, five yearly	20
2003	36	2000	Gross classification of production account by industry and by sector, A60 × (S11, S12, S13, S14, S15), five yearly	21
2003	36	2000	Gross classification of gross fixed capital formation by industry and by product, A31 × P60, five yearly	22
see table	see table	see table	Backward calculations	23

t: reference period (year or quarter).

(*) The five yearly table for the year 2000 has to be delivered in 2003.

2.3 European classification systems

At present the classification by activities and by commodities is regulated by the following two Regulations:

Commission Regulation (EC) No 29/2002 of 19 December 2001 amending Council Regulation (EEC) No 3037/90 on the statistical classification of economic activities in the European Community

Commission Regulation (EC) No 204/2002 of 19 December 2001 amending Council Regulation (EEC) No 3696/93 on the statistical classification of products by activity (CPA) in the European Economic Community

Both systems are well integrated in the international (UN) system of classifications, both classifications are multi-purpose instruments. They pay little attention to the specific needs of national accounts in general and IO analysis in particular.

As may be seen from the Transmission Programme the standard for national accounts data and IO data is the A (activity) 60 and P (product) 60 level of disaggregation, corresponding to the two digit level of the classification systems. The following page provides an overview of the standard disaggregation by product groups.

3. The near future

3.1 The IO manual

EUROSTAT is preparing the publication of an IO Manual. Starting from ESA concepts the manual focuses on compilation issues in greater detail. Its main purpose is to provide “best practices” and harmonised solutions and to help member states as well as other countries in the production process of the tables.

Although it is not published yet, the very detailed manual (more than 300 pages) is already used as a guideline for the compilation in many countries.

Chapter 11 on the transformation of supply and use tables to symmetric input-output tables deserves special attention. It evaluates the various assumptions and discusses the problem of negatives in some detail. In the sub-chapter on the calculation of the symmetric IO table on the basis of the commodity assumption Almon’s method is mentioned, discussed – and to some degree – also recommended as one of two main approaches.

The alternative method called “matrix multiplication” starts with the standard model on the basis of the commodity technology assumption. In a non-formalized iterative procedure along the lines described in 9.54 of the ESA errors in data should be eliminated and rearrangement of data is proposed in order to reduce the number of negatives in the solution. The remaining negatives are set to zero and RAS is used to make sure that the table matches the totals.

Independent of the choice of the method the manual proposes to calculate a difference matrix.

Use table = IO coefficients matrix * Supply table + Difference Matrix

The European Standard Classification of IO Data

CPA	PRODUCTS
01	Products of agriculture
02	Products of forestry
05	Fishes and products of fishes
10	Coal and lignite; peat
11	Crude petroleum, natural gas
12	Uranium and thorium ores
13	Metal ores
14	Other mining and quarrying products
15	Food products and beverages
16	Tobacco products
17	Textiles
18	Wearing apparel; furs
19	Leather and leather products
20	Wood and products of wood
21	Pulp, paper and paper products
22	Printed matter and recorded media
23	Coke, refined petroleum products
24	Chemicals, chemical products
25	Rubber and plastic products
26	Other non-metallic mineral products
27	Basic metals
28	Fabricated metal products
29	Machinery and equipment n.e.c.
30	Office machinery and computers
31	Electrical machinery and apparatus
32	Radio, TV and communication equipment
33	Med., precision, opt. instruments; watches, clocks
34	Motor vehicles, trailers and semi-trailers
35	Other transport equipment
36	Furniture; other manufactured goods n.e.c.
37	Recovered secondary raw materials
40	Electrical energy, gas, steam and hot water
41	Water; distribution services of water
45	Construction work
50	Trade and repair services of motor vehicles etc.
51	Wholesale and comm. trade serv., ex. of motor vehicles
52	Retail trade serv., repair serv., except of motor vehicles
55	Hotel and restaurant services
60	Land transport and transport via pipeline services
61	Water transport services
62	Air transport services
63	Supporting transport services; travel agency services
64	Post and telecommunication services
65	Financial intermediation services (ex. insurance serv.)
66	Insurance and pension funding services
67	Services auxiliary to financial intermediation
70	Real estate services
71	Renting services of machinery and equipment
72	Computer and related services
73	Research and development services
74	Other business services
75	Public administration services etc.
80	Education services
85	Health and social work services
90	Sewage and refuse disposal services etc.
91	Membership organisation services n.e.c.
92	Recreational, cultural and sporting services
93	Other services
95	Private households with employed persons

In one important aspect the basic philosophy of the IO Manual differs somewhat from the text of the ESA. Whereas it follows from Paragraphs 9.54 pp. that the symmetric tables are not longer consistent with the supply- use framework, the Manual makes a strong plea for consistency (or at least for a well described and documented difference) between the symmetric tables and the basic supply and use tables.

In acknowledging the trade-off between comparability in classifications and values on the one hand and “quality” of the symmetric table on the other hand “a balance could perhaps be found in requiring comparability only at the level of aggregation at which tables are published (e.g. the level of 60 products and industries). Changes to classifications or re-arrangements can then be carried out in as far as it does not change e.g. the values of supply of goods by product at the publication level. Similarly, changes that would not affect aggregates such as total output, intermediate consumption, or even GDP, should then be avoided” (IO Manual, draft p. 232).

Such a strategy would be of highly welcomed by everybody who wants to combine time series information from national account and IO data. If consistency is not guaranteed by the Statistical Office they would have to construct their own set of IO data compatible with time series. If the “difference matrix” is published it could be used in the modelling process.

3.2 New dissemination policy

A big change in the data dissemination policy of EUROSTAT is due on 1st October 2004. Almost all statistical data will be available via internet free of charge.

This change in the dissemination policy is the result of numerous complaints, many struggles, a long discussion process and last but not least, probably the by-product of the so-called EUROSTAT scandal.

In his introductory speech to the Conference of the Directors General of Statistical Offices held in Palermo in September 2002, Romano Prodi, President of the European Commission, stressed that “statistics are vital if citizens are to take part in the life of the community in an informed way. They are an essential tool of democracy”. In this respect he also emphasized “that statistical data must be both reliable and easy to grasp”.

Joachim Lamel, Vice President of CEIES (a users’ organization always very active in lobbying for fair and better access to statistical data) argued in the same way: “The easy access to statistical results is of salient importance to users, better dissemination will be one of the crucial points in turning the European Statistical System into an instrument for the citizens of Europe.”

During the same Conference Yves Franchet, then President of EUROSTAT made the proposal to develop a new integrated approach in managing relations with users: “Statistics as a public good, free of charge, delivery from a common internet portal with the same data presentation standards”.

Another notable and important step in the direction to free access to statistical data was the resolution adopted by the European Parliament on April 23, 2004: Among other things the new free dissemination policy of EUROSTAT was explicitly welcomed.

Although there is still some opposition against the new dissemination policy within the Commission and from some Statistical Offices the new system will start on October 1st.

The following characteristics are planned:

- New dissemination tools along the lines of existing instruments such as New Cronos and Comtex
- Bulk download facilities for “power users”
- Development of an elaborated meta data system

Limits to free dissemination:

- Confidentiality
- Micro data
- Some limitation: very detailed trade data and regional statistics

4. Implications for IO modelling

4.1 Positive implications of the European system

The high degree of standardization guarantees a considerable comparability of data. This homogeneity of statistics within the EU with respect to concepts, definitions and classifications is a big advantage for linking models for different countries.

The legal status of the ESA also provides a common language for researchers working in the EU. This facilitates communication and reduces the probability of misunderstanding.

Last but not least some “economies of scale” can be expected in model building. Because of the similarity of the data situation modules of INFORUM models can be easily transferred from the model of one EU country to the model of another country.

The new dissemination policy will make access to data simpler and cheaper. It will become easier to use statistical results more adequately as soon as detailed meta data will be available.

4.2 Disadvantages of the European system

The high degree of standardization – one of the goals of the European Statistical System - has its (high) price. Given the fact that all the concepts and rules are laid down in Regulations and that these Regulations “are binding in its entirety and directly applicable in all Member States”, little room is left for flexibility in general and for methodological alternatives in particular.

Not everybody will agree with all the concepts laid down in the Regulations. Many of the provisions were drafted with the operational, administrative role of national accounts in the EU in mind and cannot be considered as the most adequate solutions for the role of national accounts as the empirical basis of empirical economics.

One of the best examples how inadequate European solutions are for IO purposes are the standard classifications that have to be used. The aggregates that are formed are neither homogeneous with respect to technology, nor homogeneous with respect to labour input.

For illustration purposes the sub sectors of “70 Real estate activities” are displayed in greater detail. This industry comprises very labour intensive service activities such as 70.31 Real estate agencies and activities such as 70.2 letting of own property in which no or almost no labour input is required.

70	REAL ESTATE ACTIVITIES	
70.1	Real estate activities with own property	701x
70.11	Development and selling of real estate	7010x
70.12	Buying and selling of own real estate	7010x
70.2	Letting of own property	701x
70.20	Letting of own property	7010x
70.3	Real estate activities on a fee or contract basis	702
70.31	Real estate agencies	7020x
70.32	Management of real estate on a fee or contract basis	7020x

Vertical integration – with all its undesired consequences for IO analysis – can also be found quite frequently. One example is industry 40 Electricity, an industry in which both the production of electricity and the distribution of electricity are merged together. A second example is industry 21 Paper and paper products, a third example industry 20 Production of wood and wood products.

For most European countries the A60 classification is also not suited to give a balanced picture of economic reality. In the Austrian situation 2000 one sector is completely empty, in a second sector the number of units is so small that the figures cannot be published. The share of 13 industries out of 58 industries in total output is smaller than 0,3% of overall total output.

ooOoo

What are the “net implications” of the standardized European Statistical System for IO modelling? In many countries more data will be available than in the past. The net outcome will be even more positive if Statistical Offices can be persuaded to make the detailed material which is used internally in the process of compiling the data available to the qualified user. He will then find himself in a position to compile a data set which is more adequate to his needs than the standard product offered by the Statistical Office. The money saved because much data of the standard type will be available free of charge in the near future, could be spent for alternative tabulations and made to measure solutions. This would allow building INFORUM models according to the specific needs of different countries. European standards could nevertheless serve as the common denominators for models of somewhat different character and detail.