

European Union

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14-17-1 *Introduction*

This document describes the procedure followed in compiling an aggregated input-output table of the European Union (EU) for version 4 of the GTAP data base. The input-output table covers aggregate economic activity of all 15 member states in the EU, while version 3 of GTAP contained a table for the EU12 on the one hand (Brockmeier, 1996) and for the newcomers Austria, Finland and Sweden on the other hand (Kerkela, 1996).

Chapter 2 summarizes the method used to create the EU15 table. An input-output table for the EU15 as a whole was never constructed before. This one has been compiled from tables collected from national statistical offices. Some problems and inconsistencies which arose between the constructed input-output table and the GTAP data base are discussed in the last chapter.

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14-17-2 *Method for creating the EU15 input-output table*

The steps followed in compiling the EU data base for GTAP version 4 can be summarized as:

- a. collecting national input-output tables (section 2.1);
- b. mapping the national input-output tables to a common valuation (section 2.2);
- c. mapping the national sector classifications to the GTAP sector classification, exclusive of agricultural desegregation (section 2.3);
- d. updating the national input-output tables to a common base year (section 2.4);
- e. adding up the national input-output tables to one table for the EU15, exclusive of agricultural desegregation (section 2.5);
- f. desegregating the EU15 agricultural sector (section 2.6).

14.17.2.1 *Collecting national input-output tables*

In cooperation with the national statistical offices of the member states Eurostat has the intention to compile five-yearly input-output tables which are harmonized in accordance with the European System of Integrated National Accounts (ESA). Up to now, however, the most recent tables available by Eurostat concern to the years 1985 (Denmark, France, Germany, Italy, Spain and the United Kingdom) and 1987 (the Netherlands and Luxembourg). As the last GTAP version was already based on this input-output data base of Eurostat (Brockmeier, 1996), the use of these Eurostat data would imply that the version 4 data would be based on the same, outdated data set. It was decided not to follow this route again.

Input-output tables are issued by most of the national statistical offices. The amount of information contained in these national tables varies among countries, e.g. depending on the classification and valuation used. Due to the complexity of the data material, it is very time consuming to construct harmonized input-output tables (most important reason for the time lag between the publication of Eurostat's harmonized tables and the reported year). Nevertheless, the EU15 part of the new GTAP data will be based on input-output tables gathered from the national statistical offices. There are several reasons which favour this choice:

- at the national statistical offices in general more recent input-output tables are available compared with the 1985 tables supplied by Eurostat;
- the EU macro economic structure changed during the last decade. For example, significant changes in agricultural market organisation occurred in 1992 (MacSharry reform), which will first come into effect in the year 1993;

— in October 1990 West and Eastern Germany were reunified. Since then, production and consumption structures in that region became different from the period before 1990.

Table 1 shows information about year, number of sectors in the classification and valuation of the national input-output tables used.

Table 1. Characteristics of national input-output tables in the EU15

Country	Year	Classification	Valuation
Belgium 1)	1980	59	producer prices
Denmark	1992	127	basic and producer prices
France	1992	97	producer prices , inclusive imports, VAT
Germany	1991	59	producer prices
Greece	n.a.	n.a.	n.a.
Ireland	1990	41	basic and producer prices
Italy 1)	1985	59	producer prices
Luxembourg 1)	1987	59	producer prices
Netherlands	1993/1995	88	basic and producer prices
Portugal	1993	49	producer prices, inclusive imports, VAT
Spain	1992	56	producer prices
United Kingdom	1990	123	basic prices
Austria	1983	177	producer prices
Finland	1993	64	basic prices
Sweden	1985	88	producer prices

1) Harmonized Eurostat tables; n.a.: not available

Source: national statistical offices in EU

The table shows the diversity in years, in sector classification and in valuation. None of the input-output tables is the same. Greece did not publish a table at all, while Belgium's most recent table refers to the year 1980. Finally, all national input-output tables are grouped commodity by commodity.

14.17.2.2 Mapping the national input-output tables to a common valuation

The GTAP data base needs information about the commodity tax structure and about the import structure in a region. To match the commodity tax structure, input-output tables valued at basic prices are required. Denmark, Ireland and the Netherlands provide tables that represent intermediate demand at both basic prices (excluding net commodity taxes) and at producer prices (including net commodity taxes). On the other hand, the United Kingdom and Finland only publish tables at basic prices, while the other member states only report at producer prices. As tax matrices to convert

input-output tables to a common valuation are hardly available and the majority is valued including commodity taxes, the valuation at producer prices is taken as the basis for the EU15 input-output table. This means that both the intermediate and final demands in the table are inclusive of net commodity taxes, while the tax matrix remains empty. The Finnish and British tables, however, are reported in basic prices (which was the same for GTAP's version 3). Their tax matrices are set to zero too, as no information is available on its specific tax structures ².

Most national input-output tables consist of a domestic use matrix and a (more or less recent) import matrix valued cif. Such a separation is in accordance with GTAP's version 4. On the other hand, intermediate and final use data in the French and Portuguese tables were inclusive of imports so that a distinction between domestic and import uses is required here. Additionally, the French and Portuguese tables publish a column vector that reports total imports by commodity. With help of the structure implied by the total use matrix (sum of domestic and import use), the amount of the *row total of imports* allocated to each sector was computed (by the percentage of the *row total of uses* to each sector). Then, the estimated import matrix was subtracted from the total use matrix to obtain the domestic use matrix.

The same procedure was followed to subtract VAT from the intermediate and final use matrix. France and Portugal value intermediate and final uses also inclusive of VAT. In the national accounts information is available on total VAT by commodity. In accordance with the structure implied by the total use matrix, the amount of the *row total of VAT* was allocated to each sector. Next, the VAT matrix was subtracted from the total use matrix, while the column totals of the VAT matrix were considered as primary costs.

14.17.2.3 Mapping national sectoral classifications to GTAP classification, exclusive of agricultural disaggregation

For each national input-output table a concordance from the source classification to GTAP sectoral classification (GSC) was made. Appendix 1 shows the mappings for some individual member states. Some source sectors were too much aggregated to match the GTAP sector breakdown. In such cases a split is imposed (indicated by an asterisk).

In general, the imposed breakdown depends on the character of a sector. Firstly, disaggregation of the agricultural sector was mainly based on the SPEL data base (1996), while disaggregation of

² In cases of missing tax values, these might have been derived from the tax structure in Denmark, Ireland and the Netherlands. Subtracting the estimated tax structure from the intermediate and final demand at producer prices would have contributed a table at basic prices. Such a method was not applied however, because the three underlying countries only represent approximately 7 per cent of all economic activity in the EU15 in 1993. Therefore, it is not reasonable to consider its tax structure representative for the entire European Union.

the food processing sectors was based on FAO's supply utilization accounts. Before these splitting procedures could be executed (see section 2.6), additional information on the input and output structure for forestry and fishery was required. The distinction between agriculture, forestry and fishery differs among member states. The input-output tables for Denmark, France, the Netherlands, Portugal, United Kingdom, Sweden and Finland give the preferable GTAP split in its original form. The table for Germany makes a split between agriculture on the one hand, and forestry and fishery on the other, while the residual tables reflect one structure for agriculture, forestry and fishery as a whole. These last two aggregated versions are disaggregated using the economic accounts for agriculture and forestry (Eurostat, 1996c)³. These accounts are prepared by the statistical offices of the member states in accordance with a common methodology, and contain information on final output, intermediate consumption and gross value added for agriculture and forestry by member state. Hereafter, fishery is considered as a residual sector for GTAP.

At last, breakdowns for non-food sectors at national level were derived from compatible splitted sector information for other EU member states.

14.17.2.4 Updating the national input-output tables to a common base year

After bringing the national input-output tables to a common valuation and mapping them to the GSC, the tables must be brought to a common base year⁴. The Netherlands, Portugal and Finland published an input-output table with 1993 as reference year. This year was also chosen for updating the other national tables. In the updating process, the RAS method in particular is applied to balance the intermediate use and final use components of the tables. As far as possible, sectoral output values, primary costs, total government and private consumption, total investments, and exports for 1993 were directly setted. Most information on these data was gathered from the national accounts published by the national statistical offices, because Eurostat's statistics were generally less recent. The tables for Germany, Belgium, Ireland, Italy, United Kingdom, Austria and Sweden were updated to 1993 in accordance with this procedure. Subsequently, the import matrices had to be updated too. This was simply done by multiplying the old import shares to the new import column totals.

The tables for France, Denmark and Spain still refer to the year 1992 because of the following reasons. On the one hand, the national accounts for 1993 were not available in time for these countries. It was decided to lose no time in gathering these missing data, but to keep 1992 as

³ Unfortunately, SPEL contains no data for the forestry and fishery sectors.

⁴ An update of tables expressed in GSC was preferred above an update of tables expressed in national sector classification. The update at the national level would probably produce better results due to its further disaggregation, but this procedure would have involved much more time.

reference year. Moreover, the base year for version 4 of the GTAP data base will probably be 1994 or 1995. This implies that the EU15 table as a whole will be updated in Purdue by FIT. It is expected that the 1992-bias in the data will be more or less eliminated in the process.

At last, national account data were neither available for Luxembourg in time. As this member state only represents 0,01% of all economic activity in the EU15 neither an update was made, nor the 1987 input-output table was used in section 2.5.

14.17.2.5 Adding up the national input-output tables to one table for the EU15, exclusive of agricultural disaggregation

Table 2 shows information about the 15 member states after implementing steps a (section 2.2) through d (section 2.4).

Table 2. Characteristics of national input-output tables

Country	Year	Classification	Valuation	Currency
Belgium	1993 (ras)	50 a)	producer prices	BFR
Germany	1993 (ras)	50 a)	producer prices	DM
Ireland	1993 (ras)	50 a)	producer prices	IRP
Italy	1993 (ras)	50 a)	producer prices	LIT
Netherlands	1993	50	producer prices	DFL
Portugal	1993	50 a)	producer prices	ESC
United Kingdom	1993 (ras)	50 a)	basic prices	UKP
Austria	1993 (ras)	50 a)	producer prices	ATS
Sweden	1993 (ras)	50 a)	producer prices	SKR
Finland	1993	50 a)	basic prices	FIM
Denmark	1992	50	producer prices	DKR
France	1992	50 a)	producer prices	FF
Spain	1992	50 a)	producer prices	PES
Greece	n.a.	n.a.	n.a.	
Luxembourg	n.a.	n.a.	n.a.	

a Agricultural and food processing sectors still aggregated.

The national input-output tables are expressed in millions of national currency (Spain and Italy in thousand millions of national currency). Before adding up the tables to one EU table, they must

be converted to ECU's. Table 3 shows the exchange rates used between the national currencies and the ECU.

Table 3. Exchange rates between national currencies and the ECU in 1993

Country	Exchange rate (1 ECU=)	
Belgium	BFR	40,4712
Germany	DM	1,9354
Ireland	IRP	0,7999
Italy	LIT	1841,2300
Netherlands	DFL	2,1752
Portugal	ESC	188,3700
United Kingdom	UKP	0,7799
Austria	ATS	13,6238
Sweden	SKR	9,1215
Finland	FIM	6,6963
Denmark	DKR	7,8096 (1992)
France	FF	6,8488 (1992)
Spain	PES	132,5130 (1992)

Source: National Account ESA; Detailed tables by branch (Eurostat, 1996a).

Next, the national input-output tables expressed in ECU's are added up to one EU table (EU13) in accordance with the GTAP version 4 format. This table consists of 13 member states, excluding Luxembourg and Greece. The values of macro economic variables for these two countries (Eurostat, 1996b) were added to the EU13 table, whereupon the table was balanced again. The resulting input-output table for 1993 reflects total economic activity in the EU15, excluding disaggregation of the food sector.

14.17.2.6 *Disaggregating the EU15 agricultural sector and the food processing industry*

For the split of agriculture according to the GTAP sectoral classification the SPEL/EU-model⁵ of EUROSTAT was used. This model contains information on revenues and costs of 49 production activities (35 crop, 13 animal production activities and a fallow land activity) for all the EU member states and totals for EU12 and EU15 for the period 1975-1996. In disaggregating EU15 agriculture we made use of the EU15 table of the SPEL/EU-model.

⁵ SPEL/EU-model: Sectorales Produktions- und Einkommensmodell der Landwirtschaft der Europäischen Union (Sectoral Production and Income Model for the European Union)

We started by drawing up the GTAP input-output framework in which the SPEL/EU-data can be placed. Appendix 2 shows the mapping used to associate the production activities of SPEL with the GTAP classification. All the activities in the SPEL/EU-model produce commodities that are either used within agriculture again or leave agriculture to be processed, exported or consumed. For example a big part of cereal production is directly used as feed by animal activities and an other part is used by the processing industry for production of flour. Some activities in SPEL produce more than one product. Therefore we have to allocate the inputs that are used by these activities to two or more products. The “dairy cow” and the “other cow” activities in SPEL not only produce milk but also bovine meat. Their inputs have been allocated to the GTAP products “bovine cattle meat” and “raw milk” in proportion to the production value in SPEL. The same method is followed for the “ewes and goats” activity in SPEL which not only produces wool but also meat. There are four SPEL activities (“grass grazing”, “other root crops”, “fodder plants on arable land” and “fallow land”) that do not show up in the GTAP classification. According to SPEL the outputs of these activities are used completely by the animal activities to produce animal products. The inputs of these four activities are however used by agriculture. They have been allocated in proportion to the use of fresh and ensilaged fodder to the animal activities. This means that for the production of “raw milk” certain amounts of fertilizer and plant protection inputs are used additionally.

In the second step the input-output framework based on SPEL is used to disaggregate the agricultural sector of the EU15 input-output table described in section 2.5. The input of each sector as a percentage of the total input of agriculture according to SPEL is used to divide the total input of agriculture in the input-output table. The first problem that arises is the lack of detail of the SPEL data. Therefore in many cases we used the same input item to disaggregate several different rows of the input-output table. Appendix 3 shows the mapping we used to disaggregate the agricultural column.

After disaggregating the agricultural inputs we now have to disaggregate total agricultural output. Here an other problem arises. The SPEL supply balance sheets do give some information about domestic usage, exports, imports and stock changes. In many cases however SPEL does not indicate whether the products originate directly from the farm or from processing industries. This means that it is not clear from SPEL whether or not the export of grain really is grain or processed grain (flour). Therefore we used the FAO supply utilization accounts (SUA's) which contain detailed information on how much of each product is first processed and then consumed or exported. These SUA's are available for about 250 raw and 750 processed agricultural commodities on a timeseries basis. At first the processed commodities were converted backward into raw material equivalent by dividing them by the extraction rate (for example: flour per unit of wheat). This is done by using a special software program, called AGDAT (Keyzer et al., 1994). After this two separate balances were drawn up for each product. One balance for the raw commodity itself and one for the processed commodities in raw material equivalent. Because one product in GTAP (for example “cereal grains nec”) may include several products in the SUA's (oats, barley, maize, etc.) we had to find a common

denominator. Therefore, the different commodity flows in raw material equivalent were first valued against world market prices and then aggregated to the GTAP classification.

Next we have to deal with the processing industry. Some EU member states (Austria, Denmark, France, Finland, Netherlands, Sweden and United Kingdom) had much detail on the processing industry in their input-output table. Only the meat processing industry was not split into “bovine cattle, sheep and goat, horse meat products” and “meat products nec”. The information on the processing industry of these seven member states was used to disaggregate the inputs. For the two meat processing industries we assumed the same input structure, and for the split we used the value of their input from agriculture. The seven member states we used to disaggregate the processing industry did not have a “processing of rice” industry. For this activity we assumed the same input structure as the “food products nec” industry.

In disaggregating the output of the processing industry we also used the aggregate data of the above mentioned seven member states. For splitting the output of the “processing of rice” industry over consumption and exports the SUA data base was applied.

In the input-output table for the EU15 based on the aggregation of individual member states, the import matrix also contains one column and one row for agriculture and the processing industry. To be in line with the GTAP classification this import matrix needs to be disaggregated too. The SPEL/EU model contains information on imports of seeds and seedlings and animals by agriculture. This information is used to split imports of agriculture. For simplicity we have assumed that all inputs are produced by the same sector that uses the input. So seed used by the “wheat” activity is also produced by the foreign “wheat” activity. This means that all the agricultural imports of agriculture are on the diagonal. All the other imports of agriculture are allocated in proportion to domestic usage.

The imports of the processing industry are also allocated in proportion to domestic usage. Only the imports of agricultural products by the processing industry have been adjusted. The agricultural imports of the dairy- and meat industry have been lowered and the agricultural imports of the “food products nec” industry have been adjusted upwards. This is because the feed industry, which is included in the “food products nec” industry, uses a big amount of imported cereals and cereal supplements.

The import duties are calculated as a fixed amount of total imports. For the disaggregation of the non-commodity taxes for agriculture we used the CAP subsidies of SPEL. Rents on land have been calculated only for agriculture. They have been allocated in proportion to the area used for each product in SPEL. The total area of the SPEL activities: “grass grazing”, “other root crops”, “fodder plants on arable land” and “fallow land” has been allocated in proportion to the use of fresh and ensilaged fodder to the animal activities. Compensation for labour has been disaggregated in proportion to the gross value added of the agricultural sectors in GTAP. Finally the compensation for input of capital is calculated as a residual by subtracting all the inputs calculated this far from the value of gross output.

14.17.3. Problems and inconsistencies with GTAP data base

The EU15 table derived in section 2.6 does not supply all information necessary to match the target structure of GTAP. First of course, no information about commodity taxes is reported. This point has already been discussed in section 2.2. Secondly, only some individual member states published data on import duties. Duties for the entire EU15 were estimated utilizing the ratio between import levies and import values of the publishing countries.

Imputed bank services were reported as a separate intermediate use in the Finnish, Dutch and Irish tables. As its gross output is conceptually zero, the value added or operating surplus of this sector was expressed as a negative figure. This sector is normally transferred to the final use component of the input-output table, which means an addition to the changes in stocks for the GTAP format. As a consequence, returns to capital for the changes in stocks are negative in the EU15 table.

References

- Austrian Central Statistical Office, 1994. "Input-Output-Tabelle 1983, Band 2" Technologiematrizen; Heft 1.138/2, Wien.
- Brockmeier, M., 1996. "Consolidated Input-Output Table for the European Union 12" Giessen .
- Central Statistics Office, Ireland, 1997. "Input-Output Tables 1990." Cork.
- Central Statistics Office, Ireland, 1996. "National Income and Expenditure 1995." Cork.
- Eurostat, 1997. *SPEL/EU Data, User Manual*. Theme 5, Series C, Luxembourg.
- Eurostat, 1996a. "National Account ESA." Detailed Tables by Branch; Luxembourg.
- Eurostat, 1996b "National Accounts ESA." Aggregates 1970-1994; Luxembourg.
- Eurostat, 1996c "Economic accounts for agriculture and forestry." 1990-1994, Luxembourg.
- Institut national de la statistique et des études économiques, 1996. "Comptes et indicateurs économique." rapport sur les comptes de la Nation 1995; Paris.
- Office for national statistics, Great Britain , 1996. *United Kingdom National Accounts; the Blue Book*. London
- Instituto Nacional de Estatística, 1996. "National accounts." Lisboa
- Kerkela, L., 1996.
- Keyzer, M.A., A.C. Muskens and M. van 't Riet, 1994. "Checking and aggregating FAO's Supply Utilization Accounts: Introduction to the AGDAT Program and User's Guide," Staff Working Paper, WP-94-09, SOW-VU, Amsterdam.
- Nationale Rekeningen België, 1996. "Deel II; gedetailleerde rekeningen en tabellen." Brussels.
- Statistiska Centralbyran, 1992. "Input-Output tabeller för Sverige 1985." Orebro.
- Statistics Finland, 1996. "Panos-tuotos, Input-output 1992-1993" Helsinki.
- Statistisches Bundesamt, 1995. "Fachserie 18, Reihe 1.3, Reihe S.12 Ergebnisse der Input-Output-Rechnung 1991." Wiesbaden.

Appendix 1 Mapping between the national sector classification and GSC

GTAP

1-12	Agricultural
13	Forestry
14	Fishing
15	Coal
16	Oil
17	Gas
18	Minerals nec
19	Bovine cattle/sheep/goat/horse meat
20	Meat products nec
21	Vegetable oils and fats
22	Dairy products
23	Processed rice
24	Sugar
25	Food products nec
26	Beverages and tobacco products
27	Textiles
28	Wearing apparel
29	Leather products
30	Wood products
31	Paper products, publishing
32	Petroleum, coal products
33	Chemical, rubber, plastic products
34	Mineral products nec
35	Ferrous metals
36	Metals nec
37	Metal products
38	Motor vehicles and parts
39	Transport equipment nec
40	Machinery and equipment nec
41	Manufactures nec
42	Electricity
43	Gas manufacture, distribution
44	Water
45	Construction
46	Trade, transport
47	Financial, business, recreational serv.
48	Public administration and defence, education, health services
49	Dwellings
50	Electronic goods

Belgium and Italy

National classification		GTAP
010	* Agricultural, forestry and fishery ⁶	1-14
031	Coal and coal briquettes	15
033	Lignite (brown coal) and lignete briquettes	15
050	Products of choking	32
071	Crude petroleum	16
073	Refined petroleum products	32
075	Gas	17
095	Water (collection, purification, distribution)	44
097	Electric power	42
098	Manufactured gases	43
099	Steam, hot water, compressed air	43
110	Nuclear fuels	18
135	Iron ore and ECSC iron and steel products	35
136	Non-ECSC iron and steel products	35
137	Non-ferrous metal ores, non-ferrous metals	36
151	Cement. Lime, plaster	34
153	Glass	34
155	Earthenware and ceramic products	34
157	Other mineral and derived products	34
170	Chemical products	33
190	Metal products except machinery/transport	37
210	Agricultural and industrial machinery	40
230	Office and data processing machines, etc.	40
250	Electrical goods	50
270	Motor vehicles and engines	38
290	Other transport equipment	39
310	*Meats and meat products	19+20
330	Milk and dairy products	22
350	* Other food products	21+23+24+25
370	Beverages	26
390	Tabacco products	26
410	* Textiles and clothing	27+28
430	Leather, leather, skin goods, footwear	29
450	Timber and woorden furniture	30
471	Pulp, paper, board	31
473	Paper goods, products of printing	31
490	Rubber and plastic products	33
510	Other manufacturing products	41
530	Building and construction	45
550	Recovery and repair services	47
570	Wholesale and retail trade	47
590	Lodging and catering services	47

contd

⁶ Items which need to be split between the GTAP categories are indicated with an asterisk.

Belgium and Italy (continued)

National classification		GTAP
611	Railway transport services	46
613	Road transport services	46
617	Inland waterways services	46
631	Maritime and coastal transport services	46
633	Air transport services	46
650	Auxiliary transport services	46
670	Communication services	47
690	Credit and insurance	47
710	Business services provided to enterprise	47
730	Renting of immovable goods	49
750	Market services of education and research	47
770	Market services of health	47
790	Market services n.e.c.	47
810	General public services	48
850	Non-market services of education & research	48
890	Non-market services of health	48
930	Non-market services n.e.c.	48

France

National classification		GTAP
1	* Agriculture	1-12
2	Forestry	13
3	Fishing	14
4	Hard coal	15
5	Coke oven products	32
6	Crude petroleum	16
7	Natural Gas	17
8	Refined petroleum products	32
9	Electricity (distribution)	42
10	Gas (distribution)	43
11	Water (distribution)	44
12	Ferrous ores	18
13	Basic iron	35
14	First transformed products of steel	35
15	Other metal ores	18
16	Basic non-ferrous metals	36
17	Other mining and quarrying	18
18	Earthenware and pottery	34
19	Glass (products)	34
20	Non-organic basic chemicals	33
21	Organic basic chemicals	33
22	Chemical products	33
23	Pharmacy products	33
24	* Casting of metals	35+36

contd

France (continued)

National classification		GTAP
25	Fabricated metal products	37
26	Agricultural machinery	40
27	Tools	40
28	Industrial equipment	40
29	Mining, casting, construction equipment	40
30	War equipment	40
31	Office and communication equipment	40
32	Electricity equipment	50
33	Prof. electronic equipment	40
34	Household electronic equipment	40
35	Household machinery	40
36	Motor vehicles, bicycles	38
37	Railroad equipment	39
38	Ship building	39
39	Aeroplane building	39
40	Precision instruments	40
41	* Meat products	19+20
42	Dairy products	22
43	Canned food products	25
44	Bakery products	25
45	Cereal grain products	25
46	Vegetable fats and oils	21
47	Sugar	24
48	Other food products	25
49	Beverages	26
50	Tobacco products	26
51	Fibres	27
52	Natural textiles	27
53	Tricot	27
54	Artificial work of fibres	27
55	Leather	29
56	Leather products	29
57	Footwear	29
58	Wearing apparel	28
59	Wood products	30
60	Furniture	30
61	Paper products	31
62	Books and papers etc.	31
63	Rubber products	33
64	Plastics products	33
65	Work of art, antiques etc.	41
66	Construction	45
67	Recycling	46
68	Commerce	46
69	Repair and sales of motor vehicles	46

contd

France (continued)

National classification		GTAP
70	Repair of other products	46
71	Hotels and restaurants	46
72	Railroad transport	46
73	Merchandise transport	46
74	Other land transport	46
75	Inland water transport	46
76	Sea transport	46
77	Air transport	46
78	Transport activities etc.	46
79	Post and telecommunications	46
80	Services for real estate etc.	47
81	Renting of movable goods	47
82	Renting of houses	47
83	Renting of real goods	47
84	Services education and research	47
85	Services health work	47
86	Services recreational, cultural and sporting activities	47
87	Insurance services	47
88	Services financial activities	47
89	Administration services	47
90	Social (security) services	47
91	Public education	48
92	Public research	48
93	Public health work	48
94	Public social work	48
95	Public recreational, cultural and sporting activities	48
96	Other public work	48
97	Services private households	47

Germany

National classification		GTAP
1	* Agricultural products	1-12
2	* Forestry and fishery products, etc.	13+14
3	Electric power, steam, hot water	42
4	Gas	43
5	Water	44
6	Coal, products of coal mining	15
7	Products of mining (excl. coal, crude petroleum, natural gas)	18
8	* Crude petroleum, natural gas	16+17
9	Chemical products (incl. nuclear fuel)	33
10	Refined petroleum products	32
11	Plastic products	33
12	Rubber products	33
13	Stones and clays, building and construction materials, etc.	34

Contd

Germany (continued)

National classification		GTAP
14	Ceramic products	34
15	Glass and glass products	34
16	Iron and steel	35
17	Non-ferrous metals, semi-finished products thereof	36
18	Foundry products	37
19	Products of drawing plants, cold rolling mills, etc.	37
20	Structural metal products, rolling stock	37
21	Machinery and equipment (excl. electrical)	41
22	Office machinery, automatic data processing equipment	40
23	Road vehicles	38
24	Ships, boats and floating structures	39
25	Aircraft and spacecraft	39
26	Electrical machinery, equipment and appliances	50
27	Precision and optical instruments, clocks and watches	40
28	Tools and finished metal products	41
29	Musical instruments, games and toys, sports goods etc.	41
30	Wood	30
31	Wood products	30
32	Pulp, paper and -board	31
33	Products of paper and -board	31
34	Products of printing and duplicating	31
35	Leather and leather products, footwear	29
36	Textiles	27
37	Wearing apparel	28
38	* Food products (excl. beverages)	19-25
39	Beverages	26
40	Tobacco products	26
41	Building and civil engineering works, etc.	45
42	Installation and building completion works	45
43	Services of wholesale trade, etc., recovery	47
44	Services of retail trade	47
45	Railway services	46
46	Water transport services, services of ports, etc.	46
47	Communication services	47
48	Other transport services, n.e.c.	46
49	Banking services	47
50	Insurance services (excl. social security funds)	47
51	Real estate renting services	47
52	Market services of hotels and restaurants, homes and hostels	46
53	Market services of education, research, culture and publishing serv.	47
54	Health and veterinary market services	47
55	Other market services, n.e.c.	47
56	Services of central and local government	48
57	Services of social security funds	48
58	Services of private non-profit institutions, domestic services	48

Denmark

National classification		GTAP
1	11101 * Agriculture	1-12
1	11103 * Horticulture	1-12
1	11109 * Fur farming, etc.	1-12
1	11200 * Agricultural services	1-12
1	12000 Forestry and logging	13
1	13000 Fishing	14
5	20099 Extraction of coal, oil and gas	16
19	29000 Other mining	34
27	31113 Slaughtering etc. of pigs and cattle	19
27	31117 Poultry killing, dressing, packing	20
28	31121 Dairies	22
28	31123 Processed cheese, condensed milk	22
28	31124 Ice cream manufacturing	22
29	31130 Processing of fruit and vegetables	25
29	31140 Processing of fish	25
29	31151 Oil mills	21
29	31152 Margarine manufacturing	21
29	31153 Fish meal manufacturing	25
29	31160 Grain mill products	25
29	31171 Bread factories	25
29	31173 Cake factories	25
29	31174 Bakeries	25
29	31180 Sugar factories and refineries	24
29	31190 Chocolate and sugar confectionery	25
29	31210 Manufacture of food products n.e.c.	25
29	31229 Manuf. of prepared animal feeds	25
30	31310 Distilling and blending spirits	26
30	31338 Breweries	26
31	31400 Tobacco manufactures	26
32	32118 Spinning, weaving etc. textiles	27
32	32120 Manuf. of made-up textile goods	27
32	32130 Knitting mills	28
32	32158 Cordage, rope and twine industries	28
32	32200 Manufacture of wearing apparel	28
33	32300 Manufacture of leather products	29
33	32400 Manufacture of footwear	29
34	33100 Manuf. of wood products,excl.furnit.	30
34	33200 Manuf. of wooden furniture, etc.	30
35	34110 Manuf. of pulp, paper, paperboard	31
36	34128 Manuf. of paper containers, wallpaper	31
36	34210 Reproducing and composing services	31
36	34221 Book printing	31
36	34222 Offset printing	31
36	34223 Other printing	31
36	34230 Bookbinding	31

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Denmark (continued)

National classification	GTAP
36 34240 Newspaper printing and publishing	31
36 34291 Book and art publishing	31
36 34292 Magazine publishing	31
36 34293 Other publishing	31
20 35110 Manuf. of basic industrial chemicals	33
20 35120 Manuf. of fertilizers and pesticides	33
20 35130 Manuf. of basic plastic materials	33
20 35210 Manuf. of paints and varnishes	33
20 35220 Manufacture of drugs and medicines	33
20 35230 Manufacture of soap and cosmetics	33
20 35290 Manuf. of chemical products n.e.c.	33
6 35300 Petroleum refineries	32
20 35400 Manuf. of asphalt and roofing mater.	33
37 35510 Tyre and tube industries	33
37 35590 Manuf. of rubber products n.e.c.	33
37 35600 Manuf. of plastic products n.e.c.	33
18 36100 Manuf. of earthenware and pottery	34
17 36200 Manuf. of glass and glass products	34
18 36910 Manuf. of structural clay products	34
16 36920 Manuf. of cement, lime and plaster	34
19 36993 Concrete products and stone cutting	34
19 36998 Non-metallic mineral products n.e.c.	34
13 37101 Iron and steel works	35
21 37102 Iron and steel casting	35
15 37201 Non-ferrous metal works	36
21 37202 Non-ferrous metal casting	36
21 38121 Manufacture of metal furniture	37
21 38138 Manuf. of structural metal products	37
21 38191 Manuf. of metal cans and containers	37
21 38198 Manuf. of other fabr. metal products	37
22 38220 Manuf. of agricultural machinery	40
22 38238 Manufacture of industrial machinery	40
22 38280 Repair of machinery	40
22 38293 Manufacture of household machinery	40
22 38298 Manuf. of refrigerators, accessories	40
24 38320 Manuf. of telecommunication equip.	40
24 38330 Manuf. of electrical home appliances	50
24 38392 Manuf. of accumulators and batteries	40
24 38398 Manuf. of other electrical supplies	40
26 38410 Ship building and repairing	39
26 38438 Railroad and automobile equipment	39
26 38498 Manufacture of cycles, mopeds, etc.	39
23 38500 Professional and measuring equipm.	40
38 39010 Manufacture of jewelery, etc.	41
38 39098 Manuf. of toys, sporting goods, etc.	41

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Denmark (continued)

National classification	GTAP
9 41010 Electric light and power	42
10 41020 Gas manufacture and distribution	43
11 41030 Steam and hot water supply	43
8 42000 Water works and supply	44
39 51000 Building	45
39 52001 Repair of buildings	45
39 52002 Materials for own repair of buildings	45
39 53000 Other construction	45
41 61000 Wholesale trade	47
41 62000 Retail trade	47
42 63000 Restaurants and hotels	47
43 71118 Railway and bus transport, etc.	46
44 71138 Other land transport	46
46 71210 Ocean and coastal water transport	46
48 71230 Supporting services to water trsp.	46
47 71300 Air transport	46
48 71509 Services allied to transport, etc.	46
49 72000 Communication	47
50 81000 Financial institutions	47
50 82000 Insurance	47
52 83110 Dwellings	49
51 83509 Business services	47
53 93109 Education, market services	47
54 93300 Health, market services	47
55 94000 Recreational and cultural services	47
40 95130 Repair of motor vehicles	47
55 95299 Household services	47
59 95400 Domestic services	48
59 97099 Private non-profit institutions	48
56 98100 Government: General public services	48
56 98200 Government: Defense	48
57 98300 Government: Education and research	48
58 98400 Government: Health	48
56 98500 Government: Social security and welfare services	48
56 98600 Government: Housing and community amenities	48
56 98700 Government: Recreational and cultural services	48
56 98800 Government: Economic services	48
50 99005 FISIM (Last final demand)	47

Netherlands

National classification		GTAP
1	* Rundveehouderij	1-12
2	* Overig vee	1-12
3	* Kalvermesterij	1-12
4	* Varkenshouderij	1-12
5	* Legpluimvee	1-12
6	* Slachtpluimvee	1-12
7	* Akkerbouw	1-12
8	* Glasgroente	1-12
9	* Snijbloemen	1-12
10	* Potplanten	1-12
11	* Champignons	1-12
12	* Opengrondsgroente	1-12
13	* Fruit	1-12
14	* Bloembollen	1-12
15	* Boomkwekerij	1-12
16	* Hoveniers	1-12
17	* Agr. dienstverlening	1-12
18	Bosbouw	13
19	Visserij	14
20	Aardolie- en aardgaswinning	17
21	Overige delfstoffenwinning	18
22	* Varkens slachterij	19+20
23	* Rundvee slachterij	19+20
24	* Pluimvee slachterij	19+20
25	* Kalveren slachterij	19+20
26	* Overig vee slachterij	19+20
27	Zuivel- en melkproduktenindustrie	22
28	Visverwerkende industrie	25
29	Groente- en fruitverwerkende industrie	25
30	Graanverwerking, mens	25
31	Graanverwerking, veevoer	25
32	Suikerindustrie	24
33	Bloemverwerkende industrie	25
34	Cacao-, chocolade- en suikerverwerkende industrie	25
35	Margarine-, zetmeel- en overige voedingsmiddelenindustrie	21
36	Drankenindustrie	26
37	Tabakverwerkende industrie	26
38	Wolindustrie	27
39	Katoenindustrie	27
40	Tricot- en kousenindustrie	27
41	Textielindustrie	27
42	Kledingindustrie	28
43	Leder-, schoen- e.a. lederwarenindustrie	29
44	Hout- en meubelindustrie	30
45	Papier- en kartonindustrie	31

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Netherlands (continued)

National classification		GTAP
46	Papierwaren- en golfkartonindustrie	31
47	Grafische industrie, uitgeverijen	31
48	Aardolie-industrie	32
49	Kunstmestindustrie	33
50	Chemische basisproductenindustrie	33
51	Chemische eindproductenindustrie	33
52	Rubber- en kunststofverwerkende industrie	33
53	Bouwmaterialen-, aardewerk- en glasindustrie	34
54	Basis metaalindustrie	35
55	Metaalproductenindustrie	37
56	Machine industrie	40
57	Electrotechnische industrie	50
58	Auto-industrie	38
59	Transportmiddelenindustrie	39
60	Instrumenten-, optische en overige industrie	40
61	Elektriciteitsbedrijven	42
62	Gasdistributiebedrijven	43
63	Waterleidingbedrijven	44
64	Bouwnijverheid- en installatiebedrijven	45
65	Groothandel en detailhandel	46
66	Hotels, restaurants, cafe's e.d.	46
67	Reparatiebedrijven	47
68	Zee- en luchtvaart	46
69	Overige transport en opslagbedrijven	46
70	Communicatiebedrijven	46
71	Bankwezen	47
72	Verzekeringswezen	47
73	Woningbezit	49
74	Zakelijke dienstverlening	47
75	Overheid, burgerlijk	48
76	Overheid, militair	48
77	Overheid, onderwijs	48
78	Maatschappelijke dienstverlening	48
79	Gezondheids- en veterinaire diensten	48
80	Cultuur, sport en recreatie	48
81	Overige dienstverlenende bedrijven	48
82	Particuliere huishoudens met personeel	47
83	Goederen en diensten niet verdeeld	47
84	Handels- en vervoersmarges	46

Appendix 2 Mapping between the SPEL/EU activities and the GTAP classification

	GTAP	SPEL
1	Paddy Rice	Paddy Rice
2	Wheat	Soft Wheat Durum Wheat
3	Cereal grains nec	Rye and Meslin Barley Oats Maize Other Cereals
4	Vegetables, fruits, nuts	Potatoes Cauliflowers Tomatoes Other Vegetables Apples, Pears and Peaches Other Fruits Citrus Fruits
5	Oilseeds	Rape and Turnip Seed Sunflower Seed Soya Beans Olives for oil Other Oilseeds
6	Sugar cane, sugar beet	Sugar Beets
7	Plant-based fibers	Flax and Hemp
8	Crops nec	Pulses Tobacco Unmanufactured Other Industrial Crops Table Grapes Table Olives Table Wine Other Wine Nursery Plants Flowers, Ornamental Plants, etc. Other Final Crop Products

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	GTAP	SPEL (continued)
9	Bovine cattle, sheep and goats, horses	Male Adult Cattle for Fattening Calves for Fattening Calves, rearing Heifers Sheep and Goats for Fattening
10	Animal products nec	Pigs for Fattening Pig breeding Laying Hens Poultry for Fattening Other Animals
11	Raw milk	Dairy Cows Other Cows
12	Wool, silk-worm cocoons	Ewes and Goats

Appendix 3 Mapping between SPEL/EU-inputs and GTAP classification

	GTAP	SPEL
1-12	Agriculture	Seed and feed
13	Forestry	Variable and overheads other inputs
14	Fishing	Variable and overheads other inputs
15	Coal	Variable and overheads energy
16	Oil	Variable and overheads energy
17	Gas	Variable and overheads energy
18	Minerals nec	Variable and overheads energy
19	Bovine cattle/sheep/goats/horse meat	Total fodder input
20	Meat products nec	Total fodder input
21	Vegetable oils and fats	Fodder: other
22	Dairy products	Fodder: milk
23	Processed rice	Fodder: cereal
24	Sugar	Total fodder input
25	Food products nec	Total fodder input
26	Beverages and tobacco products	Variable and overheads other inputs
27	Textiles	Variable and overheads other inputs
28	Wearing apparel	Variable and overheads other inputs
29	Leather products	Variable and overheads other inputs
30	Wood products	Variable and overheads repairs
31	Paper products, publishing	Variable and overheads other inputs
32	Petroleum, coal products	Variable and overheads energy
33	Chemical, rubber, plastic products	M i n e r a l F e r t i l i z e r + Plant protection
34	Mineral products nec	M i n e r a l F e r t i l i z e r + Plant protection
35	Ferrous metals	Variable and overheads repairs
36	Metals nec	Variable and overheads repairs
37	Metal products	Variable and overheads repairs
38	Motor vehicles and parts	Variable and overheads repairs
39	Transport equipment nec	Variable and overheads repairs
40	Machinery and equipment nec	Variable and overheads repairs
41	Manufactures nec	Variable and overheads other inputs
42	Electricity	Variable and overheads energy
43	Gas manufacture, distribution	Variable and overheads energy
44	Water	Variable and overheads water
45	Construction	Variable and overheads repairs
46	Trade, transport	Variable and overheads other inputs
47	Financial, business, recreational services	Variable and overheads other inputs
48	Public administration, health services, etc	Pharmaceutical inputs
49	Dwellings	Variable and overheads other inputs