

11.0

Hungary and Poland

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11.0.1 Introduction

This document describes the procedure followed in compiling input-output tables of Hungary and Poland for version 5 of the GTAP data base. The input-output tables cover economic activity of the two Central European countries, while previous versions of GTAP contained only an aggregated input-output table covering all ten so-called Central European Associates including Estonia, Latvia, Lithuania, Poland, the Czech and the Slovak Republic, Hungary, Slovenia, Romania and Bulgaria. This chapter summarizes the method used to create the Polish and Hungarian tables compiled from tables collected from national statistical offices.

The steps followed in compiling the two countries' data base for GTAP version 5 can be summarized as:

- collecting national input-output tables;
- only for Hungary: mapping the detailed 1991 input-output table to the aggregated 1996 input-output table to a common valuation;
- mapping the national sectoral classifications to the GTAP sectoral classification, exclusive of agricultural and food processing disaggregation;
- only for Hungary: updating the input-output tables to 1997 values;
- disaggregating both countries' agro-food sectors.

11.O.2 *Collecting National I-O Tables*

In cooperation with the national statistical offices of Poland and Hungary three input-output tables (I-O table) had been collected. A 1997 IO-table for Poland had been compiled by the Central Statistical Agency (GUS) in Warsaw, Poland, (for sectoral details see table 11.O.A3 in the Appendix).

The I-O tables available for Hungary are a 1996 table in a breakdown of 21 sectors and a 1991 including 87 individual sectors. Table 11.O.1 shows information about year, number of sectors in the classification and valuation of the national input-output tables used. The last column of table 11.O.1 presents the exchange rates applied.

Table 11.O.1 Characteristics of Input-Output Tables in Hungary and Poland

Country	Year	Number of Sectors	Valuation
Poland	1997	57	producer prices
Hungary	1991	87	producer prices
Hungary	1996	21	producer prices

The compilation of the Hungarian I-O table was done in two steps. The first step was to update the detailed 1991 I-O table based on the 1996 values. For the mapping between both tables see table 11.O.A2 in the appendix. In a second step, the updated 1991 I-O table was disaggregated according to the GTAP classification (see table 11.O.A1 for the concordance).

11.O.3 *Mapping 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. Both countries provide tables that represent intermediate demand at producer prices (including net commodity taxes). This means that the sectoral intermediate demands in the tables are inclusive of net commodity taxes, while the tax matrix remains empty.

The Polish and the Hungarian I-O tables both consist of a domestic use matrix and an import matrix valued *c.i.f.* prices. Such a separation is in accordance with GTAP 5. However, for both countries, there was only one column that reports VAT by commodity. With the help of the structure implied by the total use matrix (sum of domestic and import use), the amount of the row total of VAT allocated to each sector was computed (by the percentage of the row total of uses to each sector). Then, the estimated VAT matrix was subtracted from the total use matrix, while the column totals of the VAT matrix were considered as primary costs.

11.0.4 Sectoral Concordance

For each national input-output table, a concordance from the source classification to the GTAP sectoral classification (GSC2) was made. The concordance tables are shown in the appendix.

Some source sectors were much too 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. Disaggregation of the agricultural sector was mainly based on the SPEL database (1996), while disaggregation of the food processing sectors was based on FAO's supply utilization accounts. The breakdown for non-food sectors at the national level were derived from compatible detailed sector information from country statistical yearbooks.

11.0.5 Updating to a Common Base Year

After mapping both countries' I-O tables to GSC2, the Hungarian table was updated to the GTAP 5 base year of 1997. Poland published an input-output table with 1997 as reference year. In the updating process for Hungary, the RAS method was applied to balance the intermediate use and final use components of the tables. As far as possible, sectoral output values, sectoral value added, sectoral total intermediate demand, government and private consumption, investments, and exports for 1997 were directly set. Most data was gathered from the national accounts published by the Hungarian statistical office. Subsequently, the import matrix had to be updated too. This was done simply by multiplying the old import shares to the new import column totals.

11.0.6 Disaggregating the Agricultural Sectors

For the split of agriculture according to the GTAP sectoral classification the SPEL/EU-model¹ 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

¹ SPEL/EU-model: Sectorales Produktions- and Einkommensmodell der Landwirtschaft der Europäischen Union (Sectoral Production and Income Model for the European Union)

member states and for four central European countries: the Czech Republic, Hungary, Poland and Slovakia (see Henrichsmeyer et al., 1999). Table 11.O.A4 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 further details of the disaggregation of the agricultural sectors based on the SPEL/EU-model see van Leeuwen and Verhoog (1998).

The input-output framework based on SPEL was used to disaggregate the agricultural sector of the I-O tables. 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 I-O tables. The first problem that arises is the lack of detail of the SPEL data. Therefore in many cases the same input item were used to disaggregate several different rows of the I-O tables. Table 11.O.2 shows the mapping to disaggregate the agricultural column.

Table 11.O.2 Mapping between SPEL/CEEC activities and the GTAP classification

	GTAP Sectors	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	Potato, cauliflower, tomato, other vegetables, apple, pears and peaches, other fruits, citrus fruits
5	Oilseeds	Rape and turnip seed, sunflower seed, soy 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 non-manufactured other industrial crops, table grapes, table olives, table wine, other wine nursery plants, flowers, ornamental plants, other final crop products
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

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Appendix

Table 11.O.A1 Mapping between the Hungarian I-O Table and GSC2

National Classification			GSC2
1	1111	Coal mining	15
2	1112	* Crude oil and natural gas mining	16,17
3	1113	Mining of bauxite	18
4	1119	Mining of other ores and minerals	18
5	1211	Production, collection and distribution of electricity	43
6	1311	Manufacture and casting of basic iron and steel	35
7	1312	Manufacture and casting of aluminum	36
8	1319	Manufacture and casting of other non-ferrous metals	36
9	141	Manufacture of machinery and equipment	41
10	142	Manufacture of transport equipment	39
11	143	Manufacture of electrical machines and appliances	40
12	144	Manufacture of telecommunication products	41
13	145	Manufacture of instruments and appliances	42
14	146	Iron and metal mass production	37
15	1511	Manufacture of bricks, tiles and refractory materials	18
16	1512	Quarrying of stones and pebble	18
17	1513	Manufacture of lime and cement	34
18	1514	Manufacture of concrete articles	34
19	1515	Manufacture of asbestos cement	34
20	1516	Manufacture of insulating materials for construction	34
21	1517	Manufacture of fine ceramics and grinding wheels	34
22	1518	Manufacture of glass	34
23	1611	Crude oil processing	32
24	1612	Production and distribution of gas	44
25	1613	Manufacture of organic and inorganic chemical products	33
26	1614	Manufacture of fertilizers and plant-protecting agents	33
27	1615	Manufacture of plastic materials and synthetic fibers	33
28	1616	Processing of synthetic materials	33
29	1617	Manufacture of rubber articles	33
30	1618	Manufacture of pharmaceutical products	33
31	1619	Manufacture of household chemicals and cosmetics	33
32	1711	Saw-milling and manufacture of plywood	30
33	1712	Carpentry and joinery for constructions	30
34	1713	Manufacture of furniture and repair of wooden products	30
35	1719	Other wood processing	30
36	1721	Manufacture of paper products	31
37	1731	Printing	31
38	1741	Cotton production	27
39	1742	Flax, hemp and jute production	27
40	1743	Wool production	27

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Table 11.O.A1 Mapping between the Hungarian I-O Table and GSC2 (continued)

National Classification			GSC2
41	1744	Silk production	27
42	1745	Manufacture of small ware	28
43	1746	Manufacture of knitted articles	28
44	1751	Manufacture of leather and fur	29
45	1752	Manufacture of footwear	29
46	176	Textile clothing	27
47	1771	Manufacture of handicrafts	42
48	181	Manufacture of other products	42
49	1911	* Meat industry	19,20
50	1912	Poultry and egg processing industry	20
51	1913	Dairy industry	22
52	1914	Canning industry	25
53	1915	* Milling industry	23,25
54	1916	Baking industry	25
55	1917	Sugar industry	24
56	1918	Sweets industry	25
57	1919	Vegetable oil industry	21
58	1921	Alcoholic drinks industry	26
59	1922	Wine industry	26
60	1923	Beer industry	26
61	1924	Production of soft drinks and mineral water	26
62	1925	Tobacco industry	26
63	211	Construction	46
64	212	Civil engineering	46
65	213	Specialized building and fitting	46
66	22	Organization, transaction and prime contracting in the building	46
67	31	* Agriculture	1-12,14
68	32	Forestry	13
69	411	Transport by rail	48
70	412+413	Transport by roads and urban transit systems and light railways	48
71	414+...+417	* Other transport	49,50
72	42/A	Post and telecommunications	51
73	51	Domestic trade	47
74	52	Foreign trade	47
75	61	Waterworks and supply	45
76	71+72	Other material activities	42
77	73	Personal and household services	54
78	74	* Business services	53,54
79	75	Financial services	52
80	761	Housing and supplementary services	54
81	762+...+77	Communal management services, environmental services	56
82	81+82	Compulsory social activities and health services	56
83	83	Social welfare activities	56
84	84	Education	56
85	85+86	Cultural services and sporting activities	55
86	91	Scientific research and experimental development	56
87	92+...+96	Public administration and other community services	56

Note: Items which need to be split between the GTAP categories are indicated by an asterisk.

Table 11.O.A2 Hungary: Mapping Between Sectors of the 1996 and 1991 I-O Tables

National classification		Sectors Numbers in the 1991 I-O table
A.01+B	Agriculture, hunting and fishing	67
A.02	Forestry	68
C.	Mining and quarrying	1-4,15-20,32,33
D.15-16	Food and tobacco industry	49-62
D.17-22	Light industry	34-47
D.23-25	Manufacture of chemicals	25-31
D.26	Manufacture of other non-metallic mineral products	8,21-23
D.27-28	Manufacture of basic metals and metal products	6-7,14
D.29-35	Machine industry	9-13
D.36-37	Manufacture of products not mentioned above	48,76
E.	Electricity, gas, steam and water supply	5,24,75
F.	Construction	63-66
G.	Wholesale and retail trade and repair	73,74
H.	Hotels and restaurants	80
I.60-63	Transport, storage	69-71
I.64	Post and telecommunications	72
J.	Financial services	79
K.	Real estate, renting and business services	77,78
L.+O.	Public administration and other service activities	81,87
M.	Education	84-86
N.	Health and social work	82,83

Table 11.O.A3 Mapping Between the Polish I-O Table and GSC2

National Classification			GSC2
1	(01)	* Agriculture and hunting products	1-12
2	(02)	Forestry products	13
3	(05)	Fishing products	14
4	(10)	Coal and peat	15
5	(11-12)	* Crude oil and natural gas	16+17
6	(13)	Metal ores	18
7	(14)	Other mining products	18
8	(15)	* Food and beverages	19-25
9	(16)	Tobacco products	26
10	(17)	Textiles	27
11	(18)	Wearing apparel	28
12	(19)	Leather and leather products	29
13	(20)	Wood and products of wood	30
14	(21)	Paper and paper products	31
15	(22)	Printed matter and recorded media	31
16	(23)	Coke, refined petroleum products	32
17	(24)	Chemicals and chemical products	33
18	(25)	Rubber and plastic products	33
19	(26)	Other non-metallic mineral products	34
20	(27)	* Basic metals	35+36
21	(28)	Metal products	37
22	(29)	Machinery and equipment	41
23	(30)	Office machinery and computers	40
24	(31)	Electrical machinery and apparatus	41
25	(32)	Radio, television and communication	40
26	(33)	Medical and optical instruments	41
27	(34)	Motor vehicles	38
28	(35)	Other transport equipment	39
29	(36)	Furniture. other manufactured goods	42
30	(37)	Recovered secondary raw materials	42
31	(40)	* Elect., gas, steam and hot water	43+44
32	(41)	Cold water and distribution	45
33	(45)	Construction work	46
34	(50)	Sale and repairs of vehicles	47
35	(51)	Wholesale and commission trade services	47
36	(52)	Retail trade services	47
37	(55)	Hotel and restaurant services	47
38	(60)	Land and pipeline transport services	48
39	(61)	Water transport services	49
40	(62)	Air transport services	50

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Table 11.O.A3 Mapping Between the Polish I-O Table and GSC2 (Continued)

National Classification			GTAP
41	(63)	Tourism services	48
42	(64)	Post and telecommunication services	51
43	(65)	Financial services	52
44	(66)	Insurance and pension funding services	53
45	(67)	Services auxiliary to financial services	52
46	(70)	Real estate services	54
47	(71)	Renting services of machinery	54
48	(72)	Computer and related services	54
49	(73)	Research and development services	54
50	(74)	Other business services	54
51	(75)	Public administration services	56
52	(80)	Education services	56
53	(85)	Health services	56
54	(90)	Sewage and refuse disposal services	56
55	(91)	Membership organization services	56
56	(92)	Recreational, cultural and sporting services	55
57	(93)	Other services	55

Note: Items which need to be split between the GTAP categories are indicated by an asterisk.

Table 11.O.A4 Mapping between SPEL/CEEC inputs and the GTAP classification

GTAP Sectors	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	Mineral Fertilizer and plant protection
34 Mineral products nec	Mineral Fertilizer and 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 Electronic equipment	Variable and overheads repairs
41 Machinery and equipment nec	Variable and overheads repairs
42 Manufactures nec	Variable and overheads other inputs
43 Electricity	Variable and overheads energy
44 Gas manufacture, distribution	Variable and overheads energy
45 Water	Variable and overheads water
46 Construction	Variable and overheads repairs
47 Trade	Variable and overheads other inputs
48 Transport nec	Variable and overheads other inputs
49 Water transport	Variable and overheads other inputs
50 Air transport	Variable and overheads other inputs
51 Communication	Variable and overheads other inputs
52 Financial services nec	Variable and overheads other inputs
53 Insurance	Variable and overheads other inputs
54 Business services nec	Variable and overheads other inputs
55 Recreational and other services	Variable and overheads other inputs
56 Public administration, defense, education, health	Pharmaceutical inputs
57 Dwellings	Variable and overheads other inputs