

11.P

Turkey

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11.P.1 Original Input-Output Table

The source table for Turkey's input-output (I-O) table is "The Input-Output Structure of the Turkish Economy 1996," published by the State Institute of Statistics in October 2001. The 1996 I-O table has 97 sectors presented as commodity by industry.¹ All transactions are reported in millions of Turkish Lira (TL). Several separate matrices are reported in the 1996 I-O tables. These include: 1) Use Table, or I-O Flow Matrix, 2) Supply Table, 3) Input Coefficient Matrix, 4) Inverse Coefficients Matrix, 5) Imports Matrix, and 6) Table of Distributive Margins.

The I-O matrix records total transactions, or the flows of goods and services among industries. The table is organized in such a way that the columns show the values of the inputs absorbed by the industries and payments to primary inputs, whereas the rows show the distribution of products into various industries and final demand categories.

In the 1996 I-O table, GDP is given at producers' prices. As far as the income approach is concerned, this measure of GDP is the sum of all income payments accruing to the factors of production including net indirect taxes, i.e. taxes minus subsidies. Import tariffs are added to this value in order to obtain GDP at market prices.

The import matrix corresponds to the I-O matrix but records the value of the imported goods purchased by industries and final demand categories. The difference between the I-O matrix and the import matrix gives the matrix of domestic usage of industries and final demand categories.

The table of distributive margins shows the difference between producers' prices and purchasers' prices of all flows of goods in the I-O table.

The final uses of GDP are classified into six categories, namely: 1) private final consumption expenditures, 2) public final consumption expenditures, 3) private fixed capital formation, 4) public fixed capital formation, 5) change in stocks, and 6) exports. Imports are reported at *cif* values and are exclusive of import duties. Exports are given at ex-factory prices. Indirect taxes are not distinguished as commodity taxes and other indirect taxes.

Gross and net value added (both at factor cost) are given as row vectors. The allocation of net value-added into returns to labor and capital is not available from the I-O table.

¹The rows of the I-O table show output disposition of a commodity and the columns show input composition of an industry.

11.P.2 Turkish I-O Table for GTAP

The domestic use table was generated by subtracting the imports matrix from the total use table. The original I-O table had some balance problems in the sense that total sales were not equal to total costs for some sectors. In order to satisfy the balance condition, the “change in stocks” column was modified to make total sales equal to total costs. Following this, the 97-sector original Turkish I-O table was aggregated up to a 46-sector table in partial concordance to the GTAP sectoral classification. Appendix table 11.P.A1 shows the mapping between the sectors from the original table (97 sectors) to the aggregated table (46 sectors). Appendix table 11.P.A2 shows the mapping between the 46 Turkish sectors and the 57 GTAP sectors. A summary of the concordance between the three sectoral classifications is given in appendix table 11.P.A3.

The 27 matrices specified in GTAP Technical Paper No.1 (Huff, McDougall, and Walmsley, 2000) were included in the Turkish I-O table for GTAP. However, no information was available in the original I-O table regarding the employment of land. The data available on employment of labor (compensation of employees) and operating surplus, which is supposed to include the payments to the rest of production factors, were distributed among land, labor and capital based on the shares provided in the GTAP 4 Data Base and in Yeldan and Köse (1996).

Data on taxes are obtained not directly from the official I-O table but from unofficial supplementary sources and should therefore be regarded with caution. Also, the original I-O table did not include a separate array of non-commodity indirect taxes. Therefore the array AI12 has zeros for many of the sectors with a few exceptions where information could be found.

One sector in the Turkish I-O table -- crude petroleum and natural gas -- was split into two GTAP sectors using shares information provided by the State Institute of Statistics. Seven percent of crude petroleum and natural gas was assigned to the GTAP *gas* sector and 93 percent was assigned to the GTAP *oil* sector.

References

- Huff, Karen, Robert McDougall, and Terrie Walmsley. 2000. “Contributing Input-Output Tables to the GTAP Data Base,” GTAP Technical Paper No. 1, Release 4.2, Center for Global Trade Analysis, Purdue University.
- Yeldan, E. and A. Köse. 1996. *Türkiye Ekonomisinde Sektörel İsgücü İstihdama ve Ücret Yapısı Üzerine Bir Deneme* (A Study on the Sectoral Employment and Wage Structure in the Turkish Economy), *Iktisat, İşletme ve Finans*, 11(118): 11-25.

Appendix

Table 11.P.A1 Mapping from 97-Sector to 46-Sector Turkish I-O Table

Turkish Sectors		Turkish/GTAP Sectors	
1	Growing of cereals and other crops nec	1	Rice, wheat, crops nec
2	Growing of vegetables, horticultural specialties and nursery products	2	Vegetables, fruits, nuts
3	Growing of fruit, nuts, beverage and spice crops		
4	Farming of animals	3	Animal husbandry
5	Agricultural and animal husbandry services		
6	Forestry	4	Forestry
7	Fishing	5	Fishing
8	Mining of coal and lignite	6	Coal
9	Crude petroleum and natural gas (93%)	7	Oil
9	Crude petroleum and natural gas (7%)	8	Gas
10	Mining of metal ores	9	Minerals nec
11	Quarrying of stone, sand and clay		
12	Mining and quarrying nec		
13	Production, processing and preserving of meat and meat products	10	Meat products
16	Vegetable and animal oils and fats	11	Vegetable oils and fats
17	Dairy products	12	Dairy products
21	Sugar	13	Sugar
14	Production and preserving of fish and fish products	14	Food products nec
15	Processing and preserving of fruits and vegetables		
18	Grain mill products, starches and starch products		
19	Prepared animal feeds		
20	Bakery products		
22	Other food products nec		
23	Alcoholic beverages	15	Beverages and tobacco products
24	Soft drinks and mineral waters		
25	Tobacco products		
26	Manufacture of textiles	16	Textiles
27	Manufacture of other textiles		
28	Manufacture of knitted and crocheted fabrics and articles		
29	Manufacture of wearing apparels except fur	17	Wearing apparel
30	Dressing and dyeing of fur, man of fur products		
31	Tanning and dressing of leather, luggage, handbags	18	Leather products
32	Manufacture of footwear		
33	Sawmilling and planing of wood and wood products	19	Wood products
34	Man. of wood and wood products		
35	Man. of paper and paper products	20	Paper products, publishing
36	Publishing		
37	Printing and printing services		
38	Man. of coke, refined petroleum products	21	Petroleum, coal products
39	Man. of basic chemicals, plastics in primary forms, synthetics rubber	22	Chemical, rubber, plastic products
40	Man. of fertilizers and nitrogen compounds		
41	Manufacture of pesticides, other agro-chemicals and paints, varnishes		

Continued

Table 11.P.A1 Mapping from 97-Sector to 46-Sector Turkish I-O Table (Cont.)

Turkish Sectors		Turkish/GTAP Sectors	
42	Manufacture of pharmaceuticals, medicinal Chemicals and botanical products	22	Chemical, rubber, plastic products (contd)
43	Manufacture of cleaning materials, cosmetics and other chemicals and man-made fibers		
44	Manufacture of rubber products		
45	Manufacture of plastic products		
46	Manufacture of glass and glass products	23	Mineral products nec
47	Manufacture of ceramic products		
48	Manufacture of cement, lime and plaster related articles these items.		
49	Cutting and finishing of stone and man. of other non-metallic mineral products nec		
50	Manufacture of basic iron and steel	24	Ferrous metals
51	Man of basic precious and non-ferrous metals	25	Metals nec
52	Casting of metals	26	Metal products
53	Manufacture of fabricated metal products, tanks, reservoirs and steam generators.		
54	Manufacture of other fabricated metal products; metal working service activities		
55	Manufacture of general purpose machinery	30	Machinery and equipment nec
56	Manufacture of special purpose machinery		
57	Manufacture of domestic appliances nec		
58	Manufacture of office, accounting and computing machinery	29	Electronic equipment
59	Manufacture of electrical machinery and apparatus nec		
60	Manufacture of radio, television and communication equipment and apparatus		
61	Manufacture of medical, precision and optical instruments, watches and clocks	30	Machinery and equipment nec
62	Manufacture of motor vehicles, trailers and semi-trailers	27	Motor vehicles and parts
63	Building and repairing of ships, pleasure and sporting boats	28	Transport equipment nec
64	Manufacture of railway and tramway locomotives and rolling stock		
65	Manufacture of aircraft and spacecraft		
66	Manufacture of transport equipment nec		
67	Manufacture of furniture	31	Manufactures nec
68	Manufacturing nec		
69	Production, collection and distribution of electricity	32	Electricity
70	Manufacture of gas; distribution of gaseous fuels through mains	33	Gas manufacture, distribution
71	Collection, purification and distribution of water	34	Water
72	Construction	35	Construction
73	Sale, maintenance and repair of motor vehicles, motorcycles; retail sale of fuel	36	Trade
74	Wholesale trade and commission trade, except for motor vehicles and motorcycles		

Continued

Table 11.P.A1 Mapping from 97-Sector to 46-Sector Turkish I-O Table (Cont.)

Turkish Sectors		Turkish/GTAP Sectors	
75	Retail trade, except for motor vehicles and motorcycles	36	Trade (contd)
76	Hotels, camping sites and other provision of short-stay accommodation		
77	Restaurants, bars and canteens		
78	Transport via railways	37	Transport nec
79	Land transport; transport via pipelines		
80	Water transport	38	Water transport
81	Air transport	39	Air transport
82	Supporting and auxiliary transport activities; activities of travel agencies	37	Transport nec
83	Postal services and telecommunication	40	Communication
84	Financial intermediation, except insurance and pension funding	41	financial services
85	Insurance and pension funding, except compulsory social security	42	Insurance
86	Real estate activities	43	Business services nec
87	Renting of machinery & equip. without operator and of personal and household goods		
88	Computer and related activities		
89	Research and development		
90	Other business activities		
91	Education	45	Public adm. and defense, education, health
92	Health and social work		
93	Activities of membership organizations nec auxiliary to financial intermediation		
94	Recreational, cultural and sporting activities	44	Recreational and other services
95	Other service activities		
96	Public administration and defense; compulsory social security	45	Public adm. and defense, education, health
97	Ownership of dwelling	46	Dwellings

Table 11.P.A2 Mapping from 46 Turkish Sectors to 57 GTAP Sectors

Turkish/GTAP Sectors		GTAP Sectors	
1	Rice, wheat, crops nec	1	pdr
1	Rice, wheat, crops nec	2	wht
1	Rice, wheat, crops nec	3	gro
2	Vegetables, fruits, nuts	4	v_f
1	Rice, wheat, crops nec	5	osd
1	Rice, wheat, crops nec	6	c_b
1	Rice, wheat, crops nec	7	pbf
1	Rice, wheat, crops nec	8	ocr
3	Animal husbandry	9	ctl
3	Animal husbandry	10	oap
3	Animal husbandry	11	rmk
3	Animal husbandry	12	wol
4	Forestry	13	frs
5	Fishing	14	fsh
6	Coal	15	coa
7	Oil	16	oil
8	Gas	17	gas
9	Minerals nec	18	omn
10	Meat products	19	cmt
10	Meat products	20	cmt
11	Vegetable and animal oils and fats	21	vol
12	Dairy products	22	mil
14	Food products nec	23	pcr
13	Sugar	24	sgr
14	Food products nec	25	ofd
15	Beverages and tobacco products	26	b_t
16	Textiles	27	tex
17	Wearing apparel	28	wap
18	Leather products	29	lea
19	Wood products	30	lum
20	Paper products and publishing	31	ppp
21	Petroleum, coal products	32	p_c
22	Chemical, rubber, plastic products	33	crp
23	Mineral products nec	34	nmm
24	Iron and steel	35	i_s
25	Metals nec	36	nfm
26	Metal products	37	fmp
27	Motor vehicles and parts	38	mvh
28	Transport equipment nec	39	otn
29	Electronic equipment	40	ele
30	Machinery and equipment nec	41	ome
31	Manufactures nec	42	omf
32	Electricity	43	ely
33	Gas manufacture, distribution	44	gdt
34	Water	45	wtr
35	Construction	46	cns
36	Trade	47	trd
37	Transport nec	48	otp
38	Water transport	49	wtp

Continued

Table 11.P.A2 Mapping from 46 Turkish Sectors to 57 GTAP Sectors (Contd.)

Turkish/GTAP Sectors		GTAP Sectors	
39	Air transport	50	atp
40	Communication	51	cmn
41	Financial services nec	52	ofi
42	Insurance	53	isr
43	Business services nec	54	obs
44	Recreational and other services	55	ros
45	Public adm. and defense, education, health	56	osg
46	Dwellings	57	dwe

Table 11.P.A3 Summary of the Sectoral Concordances

Sectors	Turkish/GTAP	GTAP SC	Turkish I-O
Rice, wheat, crops nec	01	1,2,3,5,6,7,8	1
Vegetables, fruits, nuts	02	4	2,3
Animal husbandry	03	9,10,11,12	4,5
Forestry	04	13	6
Fishing	05	14	7
Coal	06	15	8
Oil	07	16	9
Gas	08	17	9
Minerals nec	09	18	10,11,12
Meat products	10	19,20	13
Vegetable oils and fats	11	21	16
Dairy products	12	22	17
Sugar	13	24	21
Food products nec	14	23,25	14,15,18,19,20,22
Beverages and tobacco products	15	26	23,24,25
Textiles	16	27	26,27,28
Wearing apparel	17	28	29,30
Leather products	18	29	31,32
Wood products	19	30	33,34
Paper products, publishing	20	31	35,36,37
Petroleum, coal products	21	32	38
Chemical, rubber, plastic products	22	33	39,40,41,42,43,44,45
Mineral products nec	23	34	46,47,48,49
Ferrous metals	24	35	50
Metals nec	25	36	51
Metal products	26	37	52,53,54
Motor vehicles and parts	27	38	62
Transportation equipment nec	28	39	63,64,65,66
Electronic equipment	29	40	58,59,60
Machinery and equip nec	30	41	55,56,57,61
Manufactures nec	31	42	67,68
Electricity	32	43	69
Gas manufacture, distribution	33	44	70
Water	34	45	71
Construction	35	46	71
Trade	36	47	73,74,75,76,77
Transport nec	37	48	78,79,82
Water transport	38	49	80
Air transport	39	50	81
Communication	40	51	83
Financial services	41	52	84
Insurance	42	53	85
Business services nec	43	54	86,87,88,89,90
Recreation and other services	44	55	94,95
Public services	45	56	91,92,93,96
Dwellings	46	57	97