

Ukraine

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1. *Original Input-Output Table*

The input-output table for Ukraine was prepared for the GTAP Data Base by experts from Center for Social and Economic Research (CASE Ukraine). The original data sources used to construct the social accounting matrix include the official input-output table, official production statistics, and TRAINS database. The reference year of the official input-output table is 2004, it is grouped commodity-by-commodity, and includes 38 sectors, based on operating Classification of Economic Activities (KVED). The units of measurement are million Ukrainian hryvnas (UAH).

Three different kinds of original tables were used in construction of social accounting matrix, namely: (a) the input-output table valued at basic prices (table of total usage of both domestic and imported goods and services, and value-added elements); (b) the table of imports usage; and (c) the table of net taxes on intermediate and final usage. The table of usage of domestic goods and services was obtained by subtracting the elements of the imports usage matrix from the corresponding elements of the total usage matrix. The methodology used by State Statistics Committee for constructing imports usage matrix is the following:

Based on the analysis of the detailed list of imported goods and services they determine the directions of their uses. First of all, these are goods which can be used for gross fixed capital formation, final consumption, as well as intermediate consumption by certain sectors. For the rest of goods and services they assume that their uses are proportional to the uses of domestic goods.

The Ukrainian I-O table is in basic prices, i.e. the elements of intermediate consumption and final consumption expenditures do not include transportation and trade margins and taxes on production and imports, but include subsidies on production. The totals of margins and taxes mentioned above are presented in the corresponding rows of the intermediate consumption quadrant of the I-O table.

An additional column of “Financial intermediation services indirectly measured” is included in the intermediate consumption of the Ukrainian I-O table. Financial intermediation services indirectly measured represent a difference between interest, received by financial institutions under credits and paid under deposits. In the I-O table, because of impossibility of distribution by activities, this indicator is reflected in the intermediate consumption with a separate column in the “Financial intermediation” row, and when determining gross value added (in the 3rd quadrant) it is shown with minus sign.

The matrix of final consumption expenditures in the original input-output table consists of household consumption expenditures, consumption expenditure of non-profit institutions serving households, government consumption expenditures, gross fixed capital formation, changes in inventories, net acquisitions of valuables, exports, and imports with minus sign.

1.1. Household expenditures

Household expenditures constitute the major share of final consumption and characterize the consumption pattern of goods and services by population on the account of its own facilities. They comprise expenditures on acquiring consumer goods (except buildings and apartments), services, consumption of goods and services, obtained in kind and produced for own final consumption. A special item is imputed rent of living in owner-occupied dwellings. Final consumption does not include goods purchased by households for production purposes, acquisitions of buildings and residential apartments as well as acquisitions of valuables.

1.2. Final consumption expenditures

Final consumption expenditures of non-profit institutions serving households comprise the value of non-market services, rendered to households by these institutions (political parties, trade unions, youth, women's, religious and charitable organizations) as well as welfare (social and cultural) services, provided by enterprises to their employees.

1.3. Government expenditures

Government expenditures are divided into individual and collective. Individual services of government are consumed directly by households. These are also governmental outlays on procuring goods for free or preferential transfer to households (means of transport and fuel for disabled persons, handbooks, pharmaceuticals, foodstuffs). Collective services are provided to the whole community (security and defense, maintaining law and order, pursuing national policy, scientific research, etc.).

1.4. Gross fixed capital formation

Gross fixed capital formation is the increase in stocks of assets, durably utilized in production process. It comprises an increase in the produced fixed capital and improvement of the existing fixed capital and non-produced assets, expenditures connected with transfer of ownership. It does not include low-value and non-durable items, durable consumer goods, military equipment, land, minerals. "Gross" implies that this indicator does not exclude consumption of fixed capital.

1.5. Change in inventories

Change in inventories is calculated as the difference of their availability in the end and beginning of the year with adjustment for price change in view of inflation. Inventories embrace raw products and materials, fuel, forage, seeds, own-produced work-in-progress, finished products and goods for reselling.

1.6. Net acquisitions of valuables

Net acquisitions of valuables include acquisitions less disposals of jewelry, works of art, value of which does not depreciate over time.

The matrix of value-added includes compensation of employees, other taxes on production, other subsidies on production, gross operation surplus, and mixed income.

1.7. Compensation of employees

Compensation of employees consists of wages and salaries, actual and imputed employers' social insurance contributions. Wages and salaries represent compensation in cash and in kind, paid for work, executed in reference period. Employers' actual social contributions are the contributions into the funds of social insurance, pension security and employment promotion. Imputed contributions are paid by employer directly to the employees as assistance without involvement of special funds (dismissal benefit, material aid, pensions and grants out of enterprise facilities, etc.).

1.8. Gross operating surplus

Gross operating surplus, mixed income includes primary incomes received by corporations as a result of participation in production, and income of non-corporate enterprises, owned by households.

2. Adjustment of the Official I-O Table

Some adjustments to the Ukrainian I-O table were made to prepare the database for the GTAP model. These adjustments can be divided into two stages.

The first stage includes some reorganization and restructuring of the different parts of the I-O table: separating imported goods from domestic goods; adding table of taxes to the I-O table (to obtain UP); combining transportation and trade margins with non-margin usage of these services; combining the vector of household expenditures and expenditures of non-profit institutions serving households; combining collective and individual government expenditures; combining the vector of net valuables acquisitions with the gross fixed capital formation; excluding the column "Financial intermediation services indirectly measured" and making a corresponding adjustment in the 'capital' row of insurance and financial services sectors.

The second stage is the disaggregation and commodity mapping of the 38 Ukrainian sectors to GTAP classification. The disaggregation was done based on production statistics, obtained from State Statistics Committee of Ukraine. The number of obtained GTAP sectors is 46, since the agricultural sector was not disaggregated due to the lack of data (see Table in the Appendix A). This table shows how the sectoral classification of the Ukrainian I-O table was mapped to the GTAP sectoral classification. To match the GTAP sectors, some of the Ukrainian I-O table commodities had to be split. These sectors are: production of hydrocarbons; food-processing industries; textile and leather industry; woodworking, pulp, and paper industry, publishing; metallurgy and metal processing; manufacture of machinery and equipment; transport; financial intermediation.

The Ukrainian I-O table does not include information on customs import duties. Thus, *ad valorem* import duties for GTAP commodities were calculated using TRAINS database.

Non-negativity and sectoral balance constraints were applied when constructing the supplied table.

Appendix

<u>GTAP code</u>	<u>GTAP sectors</u>	<u>Initial 38 sectors</u>	<u>#</u>	<u>Disaggregated sectors</u>
1-12	Agriculture	Agriculture, hunting	1	
13	Forestry	Forestry	2	
14	Fishing	Fishery	3	
15	Coal	Mining of coal and peat	4	
16	Oil	Production of hydrocarbons	5	Oil extraction (11.10.1)
17	Gas			Natural gas extraction (11.10.2); condensation of natural gas for transporting (11.10.3)
18	Minerals nec	Production of non-energy materials	6	
19	Bovine cattle, sheep and goats, horse meat products	Food-processing industries	7	Meat products (15.1)
20	Meat products nec			Fish meat products (15.2)
21	Vegetable oils and fat			Fats (15.4)
22	Dairy products			Dairy products (15.5)
23	Processed rice			Groats production (15.61)
24	Sugar			Sugar (15.83)
25	Food products nec			Food products nec (15.3, 15.62, 15.7, 15.8 (exclusive 15.83))
26	Beverages and tobacco products			Beverages and tobacco products (15.9, 16)
27	Textiles	Textile and leather industry	8	Textile industry (17)
28	Wearing apparel			Wearing apparel and fur products (18)
29	Leather products			Leather and leather footwear products (19)
30	Wood products	Woodworking, pulp and paper industry, publishing	9	Wood and wood products (20)
31	Paper products, publishing			Paper industry; publishing (21, 22)
32	Petroleum, coal products	Manufacture of coke products	10	
		Petroleum refinement	11	
33	Chemical, rubber, plastic products	Manufacture of chemicals, rubber and plastic products	12	

<u>GTAP code</u>	<u>GTAP sectors</u>	<u>Initial 38 sectors</u>	<u>#</u>	<u>Disaggregated sectors</u>
34	Mineral products nec	Manufacture of other nonmetallic mineral products	1 3	
35	Ferrous metals	Metallurgy and metal processing	1 4	Ferrous metals (27.1)
36	Metals nec			Non-ferrous metals (27.4)
37	Metal products			Pipes (27.2), steel preprocessing(27.3), metal casting (27.5), metal processing (28)
38	Motor vehicles and parts	Manufacture of machinery and equipment	1 5	Automobiles (34)
39	Transport equipment			Other transport equipment (35)
40	Electronic equipment			Manufacture of office, accounting and computing machinery (30), manufacture of radio, television and communication equipment (32)
41	Machinery and equipment nec			Machinery and equipment (29), manufacture of electric machinery and apparatus (31), manufacture of medical, precision and optical instruments, watches and clocks (33)
42	Manufactures nec	Other production	1 6	
43	Electricity	Electric energy	1 7	
44	Gas manufacture, distribution	Gas supply	1 8	
		Heat supply	1 9	
45	Water	Water supply	2 0	
46	Construction	Construction	2 1	
47	Trade	Trade	2 2	
		Hotels and restaurants	2 3	
48	Transport nec	Transport	2 4	Land transport (60), supporting transport activities (63)

<u>GTAP code</u>	<u>GTAP sectors</u>	<u>Initial 38 sectors</u>	<u>#</u>	<u>Disaggregated sectors</u>
49	Water transport			Water transport (61)
50	Air transport			Air transport (62)
51	Communication	Post and telecommunications	2 5	
52	Financial services nec	Financial intermediation	2 6	Financial intermediation (65), activities auxiliary to financial intermediation (67)
53	Insurance			Insurance and pension funding (66)
54	Business services nec	Real estate transactions	2 7	
		Renting	2 8	
		Informatization activities	2 9	
		Research and Development	3 0	
		Services to legal entities	3 1	
55	Recreational and other services	Recreational, entertainment, cultural and sporting activities	3 7	
		Other activities	3 8	
56	Public administration and defense, education, health	Public administration	3 2	
		Education	3 3	
		Health care and social assistance	3 4	
		Sewage, cleaning of streets and refuse disposal	3 5	
		Social activities	3 6	
57	Dwellings	N/A		