

Uruguay¹

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1. Original Input-Output Table

The Input-Output (I-O) table for Uruguay contributed to GTAP was prepared using data from a 1997 I-O matrix constructed by the Department of Economics within the framework of an agreement with the *Banco Central del Uruguay* (BCU): the *Matriz de Insumo-Producto de Uruguay 1997* (MIPU97)³.

The original data used to construct the MIPU97 came from the supply and use tables (SUT97) provided by the BCU which contains 83 industries (including a financial fictitious sector⁴) and 102 commodities. The SUT97 include separate tables for production, intermediate and final use at basic prices, taxes, and commerce and transport margins (for both domestic products and imports), value-added and import tariffs, valued in 1997 thousand Uruguayan pesos.

The construction process of the MIPU97 required the conversion of the SUT97 in symmetric industry-by-industry tables with 82 sectors, which involved the following steps: 1) manual transfer of secondary products and associated inputs, 2) transfer of fictitious sector to final usage, 3) conversion of commodity-by-industry tables into industry-by-industry tables using mathematical methods.

In order to prepare the I-O table for GTAP we took as point of departure the commodity-by-industry tables obtained at stage 2, and applied a mathematical method based on the industry technology assumption to generate tables with the structure commodity-by-commodity. Next, we mapped the classification of these source tables with the GTAP sectors (see attached table), and made the data aggregations and splits required to adapt the Uruguayan I-O categories to the GTAP structure⁵ (see next section).

¹ We like to thank the *Banco Central del Uruguay* for providing the data that made this work possible.

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³ The construction of the MIPU97 is documented in “*Matriz de Insumo-Producto de Uruguay 1997*”, a draft working paper by Inés Terra (coordinator), Cecilia Olivieri, Fernanda Tellechea and Dayna Zaclicever.

⁴ The imputed financial services (Financial Intermediation Services Indirectly Measured, FISIM), were assigned to a fictitious industry and registered as intermediate consumption with a corresponding negative value added.

⁵ We decided to use commodity-by-commodity tables as the point of departure in order to facilitate the mapping with the GTAP sectors.

2. *The Structure of the Original Tables and Their Treatment*

As shown in the attached table, most of the differences in sectoral classification required an aggregation of the source data. For those Uruguayan I-O categories that had to be split in order to match the GTAP classification, we used additional information from different sources.

For agricultural sectors, the main data source was the *Ministerio de Ganaderia, Agricultura y Pesca* (MGAP) who provided the information required to make the following costs (columns) splits:

- *Other cereals and oilseeds* (sector 4 in the Uruguayan I-O table) had to be disaggregated in oilseeds and other cereals, corresponding to GTAP sectors *Oil seeds* (5) and *Cereal grains nec* (3) respectively. Using information on 1997 cost structure of two representative oilseeds (sunflower and soy-bean)⁶ we derived technical coefficients that were used to split the total amount of inputs of sector 4. The remaining few inputs for which there was no information were split according to the share of each separate product in the original aggregated output value. The output values for different crops were estimated based on data about production in physical units and prices.
- *Other crops ncp* (Uruguayan sector 6) was disaggregated in *Sugar cane, sugar beet* (GTAP sector 6) and *Crops nec* (GTAP sector 8) based on information about cost structure, production in physical units and prices of sugar cane. The inputs for which there was no information were split according to the share of sugar cane in the aggregated output value.
- *Raw milk and farm milk products* (Uruguayan sector 12) was split in *Raw milk* (GTAP sector 11) and *Dairy products* (GTAP sector 22) using information on 1997 raw milk costs, production in physical units and prices. The procedure applied was similar to that used for splitting sectors 4 and 6.

The costs splits of industrial sectors were based on data provided by the *Instituto Nacional de Estadística* (INE). The source of this information is the *Censo Económico Nacional 1997* (CEN97) which collected data about costs and output value.

- *Corn oil, starch and animal feed* (Uruguayan sector 31) was split in *Vegetable oils and fats* (GTAP sector 21) and *Food products nec* (GTAP sector 25), using information about production in physical units and prices of corn oil, and assuming for *Vegetable oils and fats* the same cost structure as Uruguayan sector 31.
- *Casting products* (Uruguayan sector 62) had to be disaggregated in *Ferrous metals* and *Metals nec* (GTAP sectors 35 and 36 respectively). Using cost and output value data of some representative firms we derived technical coefficients of ferrous metals production and used them to split the total amount of inputs of sector 62. The criterium used to split the inputs for which there was no information was the production shares of each separate product.

⁶ Based on Souto, G. (2004).

- *Machinery of special and general use* (Uruguayan sector 64) was separated in *Electronic equipment* and *Machinery and equipment nec* (GTAP sectors 40 and 41) using information about production cost structure and output value of firms producing electronic equipment. The procedure used to make the split was similar to that used in sector 62.
- *Other services* (Uruguayan sector 101) was split in *Recreation and other services* and *PubAdmin/Defense/Educ/Health* (GTAP sectors 55 and 56). This implied the transfer of drainage services to GTAP sector 56, which was done based on cost and output value data of the public enterprise in charge of these services.

Splitting of *Other minerals except crude petroleum* (Uruguayan sector 19) was not necessary because in 1997 there was no domestic production (and no import) of natural gas or coal. The same occurred with dyeing of fur, man-made fibres and raw vegetable materials used in textiles.

With regards to sales (rows), the splits of Uruguayan I-O categories required to match the GTAP classification were done using the following criteria:

- For intermediate domestic sales we used information about purchases by sector of origin (four digits of ISIC R3) and product from the CEN97.
- Exports and intermediate and final imports, when required, were split based on 1997 trade data by product provided by the BCU.
- Disaggregation of household consumption was generally done using data from the expenditures and incomes survey carried out by the INE in 1994-1995.
- Gross fixed capital formation was split using data from the CEN97.
- Splitting of changes in inventories was done based on output values.

3. *Other Considerations*

The SUT97 does not include separate information about returns to capital and land. The value-added is disaggregated in total remuneration (in cash or in kind), taxes less subsidies on production and gross operating surplus (calculated residually). We maintained this disaggregation. Likewise, there is no information available to split remuneration in skilled and non-skilled labor.

Imputed financial services, initially transferred to final usage, were reallocated to intermediate usage distributing them among non-financial sectors on the basis of the share of each sector in capital stock (measured by operating surplus).

References

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GTAP-Uruguayan I-O concordance

GTAP sector		Uruguay I-O sector		
Number	Description	Number	Description	ISIC Rev 3
1	Paddy rice	1	Rice	01111 - (01401)
2	Wheat	2	Wheat	01112 - (01401)
3	Cereal grains nec	3	Barley	01114 - (01401)
4	Vegetables, fruits, nuts	4*	Other cereals and oil seeds	01113 - (01401)
		7	Potatoes	01120 - (01401)
		8	Other vegetables ncp	01120 - (01401)
		9	Citric	01131 - (01401)
		10	Grapes	01132 - (01401)
		11	Fruits from trees and other crops	01131 - (01401)
5	Oil seeds	4*	Other cereals and oil seeds	01113 - (01401)
6	Sugar cane, sugar beet	6*	Other crops ncp	01131 - (01401)
7	Plant-based fibers	4*	Other cereals and oil seeds	01113 - (01401)
8	Crops nec	5	Forage crops	01111 - (01401)
		6*	Other crops ncp	01131 - (01401)
9	Bovine cattle, sheep and goats, horses	14	Livestock and livestock products, except wool and milk	01211 - (01402)
10	Animal products nec	15	Poultry and eggs, other animals and their products	01221 - 01222 - (01402)
11	Raw milk	12*	Raw milk and farm milk products	01212 - (01402)
12	Wool, silk-worm cocoons	13	Wool	01211 - (01402)
13	Forestry	16	Wood and other forestry products	02000
14	Fishing	17	Fishing products	05000
15	Coal	19*	Other minerals except crude petroleum	10100
16	Oil	8	Crude petroleum	11100 - (11200)
17	Gas	19*	Other minerals except crude petroleum	11100 - (11200)
18	Minerals nec	19*	Other minerals except crude petroleum	10200 - 10300 - 12000 - 13100 - 14100 - 14210 - 14220 - 14290
19	Bovine cattle, sheep and goat, horse meat product	20	Meat except poultry	15110
20	Meat products	21	Poultry meat	15110
		23	Other meat products	15110
		24	Fishing products	15120
		25	Processed fruits, vegetables products	15130
21	Vegetable oils and fats	26	Oils, except corn oil	15140
		31*	Corn oil, starch and animal feed	15140
22	Dairy products	12*	Raw milk and farm milk products	15200
		27	Milk products except cheese and fats	15200
		28	Cheese and fats	15200
23	Processed rice	29*	Processed rice and derived products	15313*
24	Sugar	33	Raw and processed sugar	15420

GTAP sector		Uruguay I-O sector		
Number	Description	Number	Description	ISIC Rev 3
25	Food products nec	29*	Processed rice and derived products	15313*
		30	Other milling products except rice	15311 - 15312
		31*	Corn oil, starch and animal feed	15320 - 15330
		32	Bakery products	15410
		34	Fresh and processed pasta	15440
		35	Chocolate, coffee, mate, and other food products	15430 - 15490
26	Beverages and tobacco products	36	Distilled alcoholic beverages and ethyl alcohol	15510
		37	Wines	15520
		38	Malted beverages	15530
		39	Non-alcoholic beverages	15540
		40	Cigarettes and other tobacco products	16000
27	Textiles	41	Yarn fabrics and weaves	17110 - 17120
		42	Other textile products	17210 - 17220 - 17230 - 17290
		43	Textiles and knitted or crocheted fabrics	17300
		57*	Paints, inks and other chemicals	24300
28	Wearing apparel	44*	Wearing apparel; dressing and dyeing of fur	18100 - 18200
29	Leather products	22	Leather	15110
		44*	Wearing apparel; dressing and dyeing of fur	18100 - 18200
		45	Processed leather and products	19110 - 19120
		46	Shoes and their parts	19200
30	Wood products	47	Products of wood, except furniture	20100 - 20210 - 20220 - 20230 - 20290
31	Paper products, publishing	48	Paper, cardboard and their products	21010 - 21020 - 21090
		49	Newspapers and periodic publishing	22120
		50	Other prints; reproduction of record media	22110 - 22130 - 22190 - 22210 - 22220 - 22300
32	Petroleum, coal products	51	Refined petroleum products	23200
33	Chemical, rubber, plastic products	52	Fertilizer and nitrogen compounds	24120
		53	Basic chemical substances except fertilizer; plastic and synthetic rubber	24110
		54	Pesticides and other agro-chemicals	24210
		55	Pharmaceutical products	24230
		56	Cleaning products and cosmetics	24240
		57*	Paints, inks and other chemicals	24220 - 24290
		58	Rubber products	25110 - 25190
		59	Plastic products, except furniture	25200
34	Mineral products	60	Glass, ceramic and clay products	26100 - 26910 - 26920 - 26930
		61	Cement, lime and plaster	26940 - 26950
35	Ferrous metals	62*	Casting products	27100 - 27310
36	Metals nec	62*	Casting products	27200 - 27320
37	Metal products	63	Fabricated metal products, except machinery	28110 - 28120 - 28130 - 28910 - 28920 - 28930 - 28990
38	Motor vehicles and parts	68	Motor vehicles, parts and accessories	34100 - 34200 - 34300
39	Transport equipment nec	69	Other transport equipment	35110 - 35120 - 35200 - 35300 - 35910 - 35920 - 35990

GTAP sector		Uruguay I-O sector		
Number	Description	Number	Description	ISIC Rev 3
40	Electronic equipment	64*	Machinery of special and general use	30000
		66	Communication equipment	32100 - 32200 - 32300
41	Machinery and equipment nec	64*	Machinery of special and general use	29110 - 29120 - 29130 - 29140 - 29150 - 29190 - 29210 - 29220 - 29230 - 29240 - 29250 - 29260 - 29270 - 29290 - 29300
		65	Machinery and electrical equipment	31100 - 31200 - 31300 - 31400 - 31500 - 31900
		67	Precision instruments	33110 - 33120 - 33130 - 33200 - 33300
42	Manufactures nec	70	Furniture and products n.e.c.	36100 - 36910 - 36920 - 36930 - 36940 - 36990 - 37100 - 37200
43	Electricity	71	Electricity	40100
44	Gas manufacture, distribution	72	Gas distribution through mains	40200 - 40300
45	Water	73	Water	41000
46	Construction	74	Residential building	45
		75	Non-residential buildings	45
		76	Roads, railroads and runways	45
		77	Other constructions	45
47	Trade	78	Sale and repair services of motor vehicles; retail sale of fuel	50100 - 50200 - 50300 - 50400 - 50500
			Wholesale trade services, except motor vehicles	51100 - 51211 - 51212 - 51220 - 51310 - 51390 - 51410 - 51420 - 51430 - 51490 - 51501 - 51502 - 51900
		79	Retail trade services, except motor vehicles and repair of household goods	52110 - 52190 - 52200 - 52330 - 52340 - 52390 - 52400 - 52510 - 52520 - 52590 - 52600
		80	Hotels	55100
		81	Restaurants	55200
		82		
48	Transport nec	83	Load land transport	60230 - 60100
		84	Passenger land transport	60100 - 60210 - 60220
		87	Auxiliary transport services	63010 - 63020 - 63030 - 63040 - 63090
49	Sea transport	85	Water transport	61100 - 61200
50	Air transport	86	Air transport	62100 - 62200
51	Communication	88	Post	64110 - 64120
		89	Telecommunications	64200
52	Financial services nec	90	Financial intermediation, except insurance	65110 - 65190 - 65910 - 65920 - 65990
53	Insurance	91	Insurance	66010 - 66020 - 66030 - 67110 - 67120 - 67190 - 67200
54	Business services nec	93	Business services	72100 - 72200 - 72300 - 72400 - 72500 - 72900 - 73100 - 73200 - 74110 - 74120 - 74130 - 74140 - 74210 - 74220 - 74300 - 74910 - 74920 - 74630 - 74940 - 74950 - 74990
55	Recreational and other services	101*	Other services	91110 - 91120 - 91200 - 91910 - 91920 - 91990 - 92110 - 92120 - 92130 - 92140 - 92190 - 92200 - 92310 - 92320 - 92330 - 92410 - 92490 - 93010 - 93020 - 93030 - 93090
		102	Household services	95000

GTAP sector		Uruguay I-O sector		
Number	Description	Number	Description	ISIC Rev 3
56	Public administration and defence, education, health services	94	Public administration	75110 - 75120 - 75130 - 75140 - 75210 - 75220 - 75230
		95	Social security	75300
		96	Public education	80100 - 80210 - 80220 - 80300 - 80900
		97	Private education	80100 - 80210 - 80220 - 80300 - 80900
		98	Public health services	85110 - 85120
		99	Private health services	85110 - 85120
		100	Other health services; social services	85190 - 85200 - 85310 - 85320
57	Dwellings	101*	Other services	90000
		92	Real estate	70100 - 70200 - 71110 - 71120 - 71130 - 71210 - 71220 - 71230 - 71290 - 71300