

Chapter 2

Guide to the GTAP Data Base

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The GTAP Data Base is a global data base representing the world economy for a given reference year. In version 12, the available reference years are 2004, 2007, 2011, 2014, 2017, 2019, and 2023. The files comprising the GTAP Data Base are distributed with two alternative aggregation packages, a command line version, FlexAgg2, and a graphical user interface (GUI) version, GTA-PAgg3. These are described in Chapters 4 and 5, respectively. In addition, the disaggregated GTAP Data Base, consistent with the version 7 model, is also available in General Algebraic Modeling System (GAMS) Data eXchange (GDX) format, which is also commonly used for modelling. The GTAP Data Base distribution for GAMS is described in Chapter 6.

The aggregation packages include all the data files that comprise the GTAP Data Base. The GTAP files consist of sets, parameters, main data, energy volume data, emissions (CO₂, non-CO₂ and air pollutants), and nutritional data. All original data files in these distributions are header array files, a GEMPACK binary format (Harrison, J.W. and Pearson, K.R. 1998). The packages are designed to aggregate GTAP data into smaller dimensions. In addition, the packages convert the aggregated data into GAMS data exchange files (GDX).

This chapter provides a guide to the components of the five GTAP Data Base files. It also covers the concordances for the 65 sectors and the 163 regions of the GTAP 12 Data Base. Details about sources and construction of the individual components, such as domestic data bases or country input output (I-O) tables, international data sets, and parameters, are provided in subsequent chapters.

2.1 Sets File

Table 2.1 shows the arrays in the sets file. The array REG is the list of regions, where r is the number of regions. Array COMM lists commodities, goods, and services that can be traded between regions, where c is the number of commodities.¹ The primary factors or endowments are represented in the set ENDW with elements land, labor, capital, and natural resources, where e is the number of primary factors. Since GTAP 9, labor is represented by five types: 2 skilled (professionals and technical) and 3 unskilled (agricultural, clerical, and other unskilled). Capital is specified within the model for the convenience of implementing the investment theory of the model.

¹Further, some commodities represent margins, see below for more information.

In the standard data base, labor and capital are classified as mobile, while land is sluggish and natural resources are fixed. This closure is typically suitable for long-run simulations. For short-run simulations, users may wish to treat capital as sluggish rather than mobile. Finally, the array MARG lists the margin commodities, where m is the number of margin commodities (sectors).

The GTAP version 7 Model (Corong et al. 2017) considers a make matrix, therefore, we also need to define and list activities in the ACTS array, where a is the number of activities.

Table 2.1: Arrays in the GTAP Sets File

Name	Dimension	Description
REG	r	Regions
COMM	c	Commodities
ENDW	e	Endowment commodities
MARG	m	Margin commodities
ACTS	a	Activities
TARS	2	Types of tariffs
BOPF	6	Balance of Payments flows

Users of the GTAP 7 Model should also note that the non-margin set, NMRG, is determined during model runtime. In the GTAP 7 Model (Corong et al. 2017), endowments are classified into three groups. The mobile endowments, which are perfectly mobile across industries within each region; the sluggish endowments, which are imperfectly mobile or immobile; and the fixed endowment, which is sector-specific. This is derived within the model based on information stored in the parameter file upon data aggregation.² The header TARS was introduced in the GTAP 8 Data Base, showing the components of tariff available in the dataset for header VMTS that reports import tariff revenue by type of tariffs paid.

For GTAP 12, we add 6 elements of the balance of payments flows in header BOPF, the data flows are reported in header VBPF of the base data, defined over REG and BOPF. The new set elements are: foreign investment income (receipts and payments), FYI and FYO, respectively; official development aid (in and out), AIDI and AIDO, respectively; and remittances (in and out), RMI and RMO, respectively. Chapter 7 describes the sources for this new data.

2.1.1 Regions

There are 163 regions in the standard GTAP 12 Data Base. The regional detail has been updated with 4 new and 18 updated I-O tables.³ A complete listing of the countries/regions is available in the Appendix, Table 2.8.⁴

²Users could change the default endowment settings by modifying the ENDOWFLAG header in the default.prm file.

³Of these updates, 2 affect the historical reference years.

⁴For information on all countries available in GTAP, please refer to the geographic coverage page.

2.1.2 Standard Countries

The GTAP 12 Data Base ‘build’ specifies a set of 251 standard countries, which is key to achieving the goal of regional flexibility in the data base construction process. Indeed, a new GTAP country can readily be added to the data base by simply modifying a mapping file used in the data construction process, along with supplying that country’s I-O table. Similarly, countries that form a GTAP composite region can be modified via this mapping file.

To achieve regional flexibility, contributors of international data sets to GTAP are encouraged to provide the data on a country basis rather than on a GTAP region basis. This facilitates the revision of the GTAP regional classification without requiring data contributors to provide new, reclassified source data. The contributed data is then mapped or transformed to apply to the set of standard countries. A mapping between the standard set of countries and the set of GTAP regions is then used to aggregate the data. The mapping file is revised when a new region is introduced in the GTAP Data Base.

The country composition of the set of standard countries for GTAP 12 is such that it omits no significant economies and it captures all significant information from the contributed international data sets. We obtain a GDP estimate for each standard country, and this is used as a scaling factor when developing the composite regions.

2.1.3 GTAP Sectoral Classification (GSEC3)

The 65 GTAP sectors are listed in Table 2.9. We define the GTAP agricultural and food processing sectors based on the Central Product Classification (CPC), as shown in Table 2.10. The other GTAP sectors are defined based on the International Standard Industry Classification (ISIC), as shown in tables 2.11 and 2.12. We use the ISIC for most sectors, because it is the reference point for sectoral classification in most I-O statistics. But for agriculture and food processing, ISIC does not provide the detail we need, so we use instead the CPC. The CPC was developed by the Statistical Office of the United Nations to serve as a bridge between the ISIC and other sectoral classifications (United Nations 2008, United Nations 2015). Another important classification we use in GTAP for trade and tariff data is the Harmonized System for merchandise or non-service sectors.⁵ The concordance between all HS classifications and GTAP’s sector classification is available from this GTAP resource’s web page.

2.2 *Parameters File*

The parameters file contains behavioral parameters and switch parameters, arranged in nineteen arrays, as listed in Table 2.2. A detailed description of the parameters and their source data is

⁵Classifications on economic statistics by the United Nations Statistical Division, including CPC, ISIC, and HS, are available from their web page.

available in Chapter 16 of the documentation.

Table 2.2: Arrays in the GTAP Parameters File

Name	Dimension	Description
ESBT	$a \times r$	CES elasticity of substitution between composite intermediate inputs
ESBC	$a \times r$	CES elasticity of substitution for intermediate inputs
ESBV	$a \times r$	CES elasticity of substitution between primary factors in the production
ETRQ	$a \times r$	CET elasticity of transformation for commodities produced by industries
ESBQ	$c \times r$	1/CES elasticity for commodity sourcing
INCP	$c \times r$	CDE expansion parameter in the consumer demand system
SUBP	$c \times r$	CDE substitution parameter in the consumer demand system
ESBG	r	CES elasticity of substitution for government demands
ESBI	r	CES elasticity of substitution for investment demands
ESBD	$c \times r$	Armington elasticity of substitution (CES) between domestic product and imports
ESBM	$c \times r$	Armington elasticity of substitution (CES) between imports from different regions
AESD	$c \times r$	CEPII based CES between domestic and imported goods
AESM	$c \times r$	CEPII based CES between imports across sources
ESBS	m	CES elasticity of substitution for international transport margins
ETRE	$e \times r$	CET elasticity of transformation between industries for sluggish primary factors
RFLX	r	flexibility of expected net rate of return on capital stock w.r.t. investment
RDLT	1	binary switch mechanism for allocating investment funds
EFLG	$e \times 3$	binary switch mechanism for endowment mobility (mobile, sluggish, or fixed)
SLUG	8	sluggish-mobile switch parameter

2.3 Data File

The main data file consists of dollar values of flows of goods and services listed in Table 2.13. This is measured in millions of current US dollars.

The main data file also includes arrays summarizing the value of revenue generated from protection measures and the subsidy expenditures related to support measures. These values are all in millions of current U.S. dollars of the reference year.

The protection data is available in the GTAP data file both implicitly and explicitly. Implicitly, the rates of different protection instruments may be calculated from two matrices that refer to two different valuations of the same value flow. Table 2.3 shows the protection measures that may be calculated from the data base and the arrays associated with these measures. The import and export duties calculated from the data base are the comprehensive measures, described in the detailed documentation.

The protection data explicitly declared in the GTAP data file are the revenue values or

Table 2.3: Implicit Protection in the GTAP Data File

Protection Measures	Formula ^a	Description
Import Duties	VMSB / VCIF	power of import tax (comprehensive)
Export Duties	VFOB / VXSB	power of export tax (comprehensive)
Output Subsidies	MAKEB / MAKES	power of output tax
Domestic Inputs Subsidies	VDFP / VDFB	power of domestic intermediate input tax
Imported Inputs Subsidies	VMFP / VMFB	power of imported intermediate input tax
Factor-Based Payments	EVFB / EVOS	power of factor-based subsidies

^aThe difference between the two value flows gives value of revenue or subsidy expenditure.

expenditure values associated with the protection measures. The revenues/expenditures from the different types of import and export instruments are given in separate arrays. These explicit arrays are ADRV, FBEP, FTRV, ISEP, CSEP, MFRV, PTAX, PURV, TFRV, VRRV, VMTS, and XTRV in Table 2.13.

2.4 Energy Volumes Data File

As shown in Table 2.4, the energy volumes data file includes three arrays reporting the volume of energy purchases by firms and by households and also the volume of bilateral trade in energy products, in millions of tons of oil equivalents (Mtoe). The headers in this file have changed since version 8.⁶ The detailed documentation available online describes the construction of the energy data.

Table 2.4: Arrays in the Energy Volumes Data File

Name	Dimension ^a	Description
EDF	$n \times p \times r$	Firms usage of domestic products (Mtoe)
EDP	$n \times r$	Households consumption of domestic products (Mtoe)
EDG	$n \times r$	Government consumption of domestic products (Mtoe)
EDI	$n \times r$	Investment consumption of domestic products (Mtoe)
EMF	$n \times p \times r$	Firms usage of imports (Mtoe)
EMP	$n \times r$	Households consumption of imports (Mtoe)
EMG	$n \times r$	Government consumption of imports (Mtoe)
EMI	$n \times r$	Investment consumption of imports (Mtoe)
EXI	$n \times r \times r$	Volume of bilateral trade (Mtoe)

^a n is the number of energy commodities (sectors); p is the number of produced commodities (sectors); r is the number of regions.

⁶With the transition to GTAP model version 7, I is now used for investment and M for imports.

2.5 CO₂ Emissions From Fossil Fuel Combustion Data File

In the versions before GTAP 8 Data Base, this file was part of the satellite dataset. Since GTAP 8 Data Base, the energy volumes data file explained above was modified in its structure mainly to accommodate this new structure of CO₂ emissions dataset, described in Table 2.5.

Table 2.5: Arrays in the CO₂ Emissions Data File

Name	Dimension ^a	Description
MDF	$n \times p \times r$	Emissions from Firms usage of domestic product (Mt CO ₂)
MMF	$n \times p \times r$	Emissions from Firms usage of imported product (Mt CO ₂)
MDP	$n \times r$	Emissions from Household consumption of domestic product (Mt CO ₂)
MMP	$n \times r$	Emissions from Household consumption of imported product (Mt CO ₂)
MDG	$n \times r$	Emissions from Government consumption of domestic product (Mt CO ₂)
MMG	$n \times r$	Emissions from Government consumption of imported product (Mt CO ₂)
MDI	$n \times r$	Emissions from Investment consumption of domestic product (Mt CO ₂)
MMI	$n \times r$	Emissions from Investment consumption of imported product (Mt CO ₂)

^a n is the number of energy commodities (sectors); p is the number of produced commodities (sectors); r is the number of regions.

2.6 Complementary Greenhouse Gas Emissions Data File

This file includes CO₂ emissions associated with process (i.e., not combustion), the non-CO₂ greenhouse gases and the non-greenhouse gas air emissions.⁷ The two sets of air emissions have largely the same functionality from the point of view of the geometry of the data sets, and thus it is practical to merge them in Table 2.6. Differences in functionality are noted below.

The set of non-CO₂ greenhouse gases includes:⁸

- Methane (CH₄ or CH4): Methane is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from livestock and other agricultural practices (e.g., rice cultivation) and from the decay of organic waste in municipal solid waste landfills.
- Nitrous oxide (N₂O or N2O): Nitrous oxide is emitted during agricultural and industrial activities, combustion of fossil fuels and solid waste, as well as during treatment of waste water.

⁷Chepeliev 2020b describes the construction of the non-CO₂ greenhouse gas data base for the GTAP Data Base and Chepeliev 2020a describes the construction of the non-greenhouse gas air emissions data set.

⁸Adapted from <https://www.epa.gov/ghgemissions/overview-greenhouse-gases>.

Table 2.6: Arrays in the Non-CO₂ Emissions Data File

Name	Dimension ^a	Description
GWP	$g \times r \times s$	Global warming potential
EMIO	$l \times c \times a \times r$	Emissions linked to fossil fuel combustion in production, mmt
EMEN	$l \times e \times a \times r$	Endowment-based emissions, mmt
EMQO	$l \times a \times r$	Output-based emissions, mmt
EMHH	$l \times c \times r$	Private-based emissions, mmt
EMIP	$l \times c \times a \times r$	Processed emissions linked to intermediate demand, mmt
EMLU	$l \times u \times t \times r$	Land-use emissions, mmt

^a g is the number of GHG emissions; s is the number IPCC assessment reports; l lists all emissions, u is the number of land-use categories, t is the number of land-use sub-categories, r is the number of regions.

- 25 Fluorinated gases (FGAS): Hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and nitrogen trifluoride are synthetic, powerful greenhouse gases that are emitted from a variety of industrial processes. Fluorinated gases are sometimes used as substitutes for stratospheric ozone-depleting substances (e.g., chlorofluorocarbons, hydrochlorofluorocarbons, and halons). These gases are typically emitted in smaller quantities, but because they are potent greenhouse gases, they are sometimes referred to as High Global Warming Potential gases (“High GWP gases”).

The set of non-greenhouse gas air emissions includes:

- Black carbon (BC): Black carbon is the sooty black material emitted from gas and diesel engines, coal-fired power plants, and other sources. It comprises a significant portion of particulate matter or PM, which is an air pollutant.
- Carbon monoxide (CO): Carbon monoxide is a colorless, practically odorless, and tasteless gas or liquid. It results from the incomplete oxidation of carbon in combustion.
- Ammonia (NH₃ or NH3): About 80% of the ammonia produced in industry is used in agriculture as fertilizer. Ammonia is also used as a refrigerant gas, to purify water supplies, and in the manufacture of plastics, explosives, fabrics, pesticides, dyes, and other chemicals.
- Non-methane volatile organic compounds (NMVOC): Non-methane volatile organic compounds are a large variety of chemically different compounds, such as benzene, ethanol, formaldehyde, cyclohexane, 1,1,1-trichloroethane, or acetone. Essentially, NMVOCs are identical to volatile organic compounds (VOCs), but with methane excluded.
- Nitrogen oxides (NO_x or NOX): In atmospheric chemistry, NO_x is a generic term for the nitrogen oxides that are most relevant for air pollution, namely nitric oxide (NO) and nitrogen dioxide (NO₂). These gases contribute to the formation of smog and acid rain, as well as affecting tropospheric ozone.

- Organic carbon (OC): Organic carbon aerosols are particulate aerosols formed by the incomplete combustion of typically biomass.
- Particulate matter 10 (PM₁₀): PM₁₀ is particulate matter 10 micrometers or less in diameter. PM₁₀ and PM_{2.5} are produced from a wide range of industrial processes through bulk material handling, combustion and minerals processing. The industries using these processes include brickworks, refineries, cement works, iron and steel making, quarrying, and fossil fuel power plants. Particulates are released from a wide range of diffuse sources. Examples include lawn mowing, wood stoves, fires, and wind-generated dust, though this tends to be coarser. Vehicles will generate particulates either from direct emissions from the burning of fuels (especially diesel-powered vehicles) or from the wear of tires.
- Particulate matter 2.5 (PM_{2.5}): PM_{2.5} is particulate matter 2.5 micrometers or less in diameter.
- Sulfur dioxide (SO₂ or SO₂): The largest source of SO₂ in the atmosphere is the burning of fossil fuels by power plants and other industrial facilities. Short-term exposures to SO₂ can harm the human respiratory system and make breathing difficult. People with asthma, particularly children, are sensitive to these effects of SO₂.

Unlike the CO₂ emissions file, which in GTAP accounts from the combustion of fossil fuels, the non-CO₂ greenhouse gas emissions are driven by consumption (intermediate and final), factor use (e.g., methane emissions from livestock capital use or rice land use), and/or output (process-based emissions such as methane from landfills).⁹

All gases are provided in physical units. The GWP adjustment coefficients are provided as a separate parameter (GWP) and are currently available for three IPCC assessment reports (AR2, AR4, and AR5).

2.7 *Food Balance Sheet*

The nutritional accounts are based on data from the Food and Agriculture Organization (FAO) to estimate the nutritional content. Calories, fats, proteins, and carbohydrates are estimated and reported. Also included are use categories that account for food, feed, seeds, and losses, among other uses. In terms of food supply, the following are identified: primary commodities, food processing, and service sectors that supply food, see Table 2.7. For detailed documentation, please refer to Chepeliev 2022.

⁹The commodity-driven non-CO₂ greenhouse gas emissions are linked to the level of aggregate absorption and not differentiated by source (domestic vs. imported).

Table 2.7: Arrays in the Food Balance Sheet Data File

Name	Dimension ^a	Description
NUTR	$c \times u \times a \times s \times r$	Nutritional accounts, in Kilo tons (KT) or Tera Calories (TC)

^a c is the number of commodities; u is the number supply-use categories; a lists all accounts, s is the number of regional source of calories, r is the number of regions.

2.8 GTAP 12 Data Packages

The GTAP 12 Data Base is available via three distributions. The first two distributions perform an aggregation controlled or specified by the user. The command line version, where the user has access to the full 65-sector x 163-region GTAP Data Base is called FlexAgg2 (see chapter 4). There is also the Graphical User Interface (GUI) Package, GTAPAgg2, described in chapter 5. These data packages help perform a consistent aggregation of the data base for use with an economic model, such as the GTAP model.

The GTAP model can be implemented using the RunGTAP software. RunGTAP is a graphical user environment developed by Mark Horridge from the Centre of Policy Studies, Victoria University in Australia. RunGTAP allows the user to run simulations interactively in a Windows environment using the GTAP-suite of general equilibrium models. While previous aggregation utilities also produce GDX versions of aggregated data files, a third distribution is also provided with fully disaggregated GTAP Data Base in GDX containers.

Pricing and order information, as well as online documentation, are available on the GTAP website.

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Table 2.8: The 163 countries/regions in GTAP 12.

No.	Code	Name	No.	Code	Name
1	aus	Australia	44	gtm	Guatemala
2	nzl	New Zealand	45	hnd	Honduras
3	xoc	Rest of Oceania	46	nic	Nicaragua
4	chn	China	47	pan	Panama
5	hkg	Hong Kong	48	slv	El Salvador
6	jpn	Japan	49	xca	Rest of Central America
7	kor	Korea	50	dom	Dominican Republic
8	mng	Mongolia	51	hti	Haiti
9	twm	Taiwan	52	jam	Jamaica
10	xea	Rest of East Asia	53	pri	Puerto Rico
11	brn	Brunei Darussalam	54	tto	Trinidad and Tobago
12	khm	Cambodia	55	xcb	Caribbean
13	idn	Indonesia	56	aut	Austria
14	lao	Lao People's Democratic Republic	57	bel	Belgium
15	mys	Malaysia	58	bgr	Bulgaria
16	phl	Philippines	59	hrv	Croatia
17	sgp	Singapore	60	cyp	Cyprus
18	tha	Thailand	61	cze	Czech Republic
19	vnm	Viet Nam	62	dnk	Denmark
20	xse	Rest of Southeast Asia	63	est	Estonia
21	afg	Afghanistan	64	fin	Finland
22	bgd	Bangladesh	65	fra	France
23	ind	India	66	deu	Germany
24	npl	Nepal	67	grc	Greece
25	pak	Pakistan	68	hun	Hungary
26	lka	Sri Lanka	69	irl	Ireland
27	xsa	Rest of South Asia	70	ita	Italy
28	can	Canada	71	lva	Latvia
29	usa	United States of America	72	ltu	Lithuania
30	mex	Mexico	73	lux	Luxembourg
31	xna	Rest of North America	74	mlt	Malta
32	arg	Argentina	75	nld	Netherlands
33	bol	Bolivia	76	pol	Poland
34	bra	Brazil	77	prt	Portugal
35	chl	Chile	78	rou	Romania
36	col	Colombia	79	svk	Slovakia
37	ecu	Ecuador	80	svn	Slovenia
38	pry	Paraguay	81	esp	Spain
39	per	Peru	82	swe	Sweden
40	ury	Uruguay	83	gbr	United Kingdom
41	ven	Venezuela	84	che	Switzerland
42	xsm	Rest of South America	85	nor	Norway
43	cri	Costa Rica	86	xef	Rest of EFTA

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No.	Code	Name	No.	Code	Name
87	alb	Albania	126	gha	Ghana
88	srb	Serbia	127	gin	Guinea
89	blr	Belarus	128	mli	Mali
90	rus	Russian Federation	129	mrt	Mauritania
91	ukr	Ukraine	130	ner	Niger
92	xee	Rest of Eastern Europe	131	nga	Nigeria
93	xer	Rest of Europe	132	sen	Senegal
94	kaz	Kazakhstan	133	tgo	Togo
95	kgz	Kyrgyzstan	134	xwf	Rest of Western Africa
96	tjk	Tajikistan	135	ago	Angola
97	uzb	Uzbekistan	136	caf	Central African Republic
98	xsu	Rest of Former Soviet Union	137	tcd	Chad
99	arm	Armenia	138	cog	Congo
100	aze	Azerbaijan	139	cod	Democratic Republic of the Congo
101	geo	Georgia	140	gnq	Equatorial Guinea
102	bhr	Bahrain	141	gab	Gabon
103	irn	Iran, Islamic Republic	142	stp	São Tomé and Príncipe
104	irq	Iraq	143	bdi	Burundi
105	isr	Israel	144	com	Comoros
106	jor	Jordan	145	eth	Ethiopia
107	kwt	Kuwait	146	ken	Kenya
108	lbn	Lebanon	147	mdg	Madagascar
109	omn	Oman	148	mwi	Malawi
110	pse	State of Palestine	149	mus	Mauritius
111	qat	Qatar	150	moz	Mozambique
112	sau	Saudi Arabia	151	rwa	Rwanda
113	syr	Syria	152	sdn	Sudan
114	tur	Türkiye	153	tza	Tanzania
115	are	United Arab Emirates	154	uga	Uganda
116	xws	Rest of Western Asia	155	zmb	Zambia
117	dza	Algeria	156	zwe	Zimbabwe
118	egy	Egypt	157	xec	Rest of Eastern Africa
119	mar	Morocco	158	bwa	Botswana
120	tun	Tunisia	159	swz	Eswatini
121	xnf	Rest of North Africa	160	nam	Namibia
122	ben	Benin	161	zaf	South Africa
123	bfa	Burkina Faso	162	xsc	Rest of South African Customs Union
124	cmr	Cameroon	163	xtw	Rest of the World
125	civ	Cote d'Ivoire			

Table 2.9: GTAP sector classification (GSEC3).

No.	Code	Description	No.	Code	Description
1	pdr	Paddy rice	34	bph	Basic pharmaceutical products
2	wht	Wheat	35	rpp	Rubber and plastic products
3	gro	Cereal grains, not elsewhere classified (n.e.c.)	36	nmn	Mineral products n.e.c.
4	v_f	Vegetables, fruit, nuts	37	i_s	Ferrous metals
5	osd	Oil seeds	38	nfm	Metals n.e.c.
6	c_b	Sugar cane, sugar beet	39	fmp	Metal products
7	pfb	Plant-based fibers	40	ele	Computer, electronic and optical products
8	ocr	Crops n.e.c.	41	eeq	Electrical equipment
9	ctl	Cattle, sheep, goats, horses	42	ome	Machinery and equipment n.e.c.
10	oap	Animal products n.e.c.	43	mvh	Motor vehicles and parts
11	rmk	Raw milk	44	otn	Transport equipment n.e.c.
12	wol	Wool, silk-worm cocoons	45	omf	Manufactures n.e.c.
13	frs	Forestry	46	ely	Electricity
14	fsh	Fishing	47	gdt	Gas manufacture, distribution
15	coa	Coal	48	wtr	Water
16	oil	Oil	49	cns	Construction
17	gas	Gas	50	trd	Trade
18	oxt	Other extraction (formerly omn Minerals n.e.c.)	51	afs	Accommodation, Food and service activities
19	cmt	Meat: cattle, sheep, goats, horse	52	otp	Transport n.e.c.
20	omt	Meat products n.e.c.	53	wtp	Sea transport
21	vol	Vegetable oils and fats	54	atp	Air transport
22	mil	Dairy products	55	whs	Warehousing and support activities
23	pcr	Processed rice	56	cmn	Communication
24	sgr	Sugar	57	ofi	Financial services n.e.c.
25	ofd	Food products n.e.c.	58	ins	Insurance (formerly isr)
26	b_t	Beverages and tobacco products	59	rsa	Real estate activities
27	tex	Textiles	60	obs	Business services n.e.c.
28	wap	Wearing apparel	61	ros	Recreation and other services
29	lea	Leather products	62	osg	Public administration and defense
30	lum	Wood products	63	edu	Education
31	ppp	Paper products, publishing	64	hht	Human health and social work activities
32	p_c	Petroleum, coal products	65	dwe	Dwellings
33	chm	Chemical products			

Table 2.10: Food and Agricultural Sectors Concordances against CPC ver. 2.1.

Code	Description	CPC version 2.1
pdr	Paddy rice	0113
wht	Wheat	0111
gro	Cereal grains not elsewhere classified (n.e.c.)	0112, 0114-0119 ^a
v_f	Vegetables, fruit, nuts	012, 013, 015, 017
osd	Oilseeds and oleaginous fruits	014
c_b	Sugar crops (cane, beet)	018
pfb	Plant-based fibers	0192
ocr	Crops nec	016, 0191, 0193-0197, 0199
ctl	Bovine animals, horses and other equines	0211-0213, 0299
oap	Other animals and animal products nec	0214, 0215, 0219, 023, 024, 0291-0293, 0295, 0296
rmk	Raw milk	022
wol	Wool, silk-worm cocoons	0294
frs	Forestry and logging products	03
cmt	Bovine meat products	21111, 21112, 21115-21119, 2113, 2115
omt	Meat products nec	21113, 21114, 2112, 2114, 2116-2119
vol	Vegetable oils and fats	215-219
mil	Dairy products and egg products	22
pcr	Processed rice	2316
sgr	Sugar and molasses	235
ofd	Food products nec	212-214, 2311-2314, 2317, 2318, 232-234, 236-239
b_t	Beverages and tobacco products	24, 25

^aFor convenience, we use ‘-’ to indicate all elements in between; for example, Cereal grains n.e.c. (gro) is composed of CPC products: 0112, 0114, 0115, 0116, 0117, 0118, and 0119.

Table 2.11: Manufacturing Sectors Concordances against ISIC rev. 4.

Code	Description	ISIC revision 4
fsh	Fishing	03, 017
coa	Coal	05
oil	Oil	061, 091 (part) ^a
gas	Gas	062, 091 (part)
oxt	Other extraction (formerly omn Minerals n.e.c.)	07, 08, 099
tex	Textiles	13
wap	Wearing apparel	14
lea	Leather products	15
lum	Wood products	16
ppp	Paper products, printing	17, 18
p_c	Petroleum, coal products	19
chm	Chemical products	20
bph	Basic pharmaceutical products	21
rpp	Rubber and plastic products	22
nmm	Mineral products n.e.c.	23
i_s	Ferrous metals	241, 2431
nfm	Metals n.e.c.	242, 2432
fmp	Metal products	25
ele	Computer, electronic and optical products	26
eeq	Electrical equipment	27
ome	Machinery and equipment n.e.c.	28
mvh	Motor vehicles and parts	29
otn	Transport equipment n.e.c.	30
omf	Manufactures n.e.c.	31, 32, 33

^aThe oil and gas sectors are assigned part of ISIC code 091, "Support activities for petroleum and natural gas extraction", because more detailed ISIC codes are not available.

Table 2.12: Services Sectors Concordances against ISIC rev. 4.

Code	Description	ISIC revision 4
ely	Electricity; steam and air conditioning supply	351, 353
gdt	Gas manufacture, distribution	352
wtr	Water supply; sewerage, waste management and remediation activities	36-39 ^a
cns	Construction	41-43
trd	Wholesale and retail trade; repair of motor vehicles and motorcycles	45-47
afs	Accommodation and food service activities	55, 56
otp	Land transport and transport via pipelines	49
wtp	Water transport	50
atp	Air transport	51
whs	Warehousing and support activities	52
cmn	Information and communication	53, 58-63
ofi	Financial services nec	64, 661, 663
ins	Insurance (formerly isr)	65, 662
rsa	Real estate activities	68
obs	Other business services	69-82 (M and N)
ros	Recreational and other services	90-98 (R, S, and T)
osg	Public administration and defense; compulsory social security; and activities of extraterritorial organizations and bodies	84, 99
edu	Education	85
hht	Human health and social work activities	86-88 (Q)
dwe	Dwellings	not available

^aFor convenience, we use ‘-’ to indicate all elements in between; for example, Water supply (wtr) is composed of ISIC codes: 36, 37, 38, and 39.

Table 2.13: Arrays in the GTAP Data File

Name	Dimension ^a	Description
ADRV	$c \times r \times r$	anti-dumping duty
DPSM	r	sum of distribution parameters in the household demand system
EVFP	$e \times a \times r$	primary factor purchases, at producer prices
EVOS	$e \times a \times r$	primary factor sales, at supply prices (post-income tax)
FBEP	$e \times a \times r$	factor-based subsidies
FTRV	$e \times a \times r$	gross factor employment tax revenue
ISEP	$c \times a \times r \times d$	net investment input subsidies
CSEP	$c \times a \times r \times d$	net intermediate input subsidies
MFRV	$c \times r \times r$	export tax equivalent of MFA quota premium
POP	r	Population
PTAX	$c \times a \times r$	net output taxes or subsidies
PURV	$c \times r \times r$	export tax equivalent of price undertakings
SAVE	r	net saving, by region
TFRV	$c \times r \times r$	ordinary import duty
VDEP	r	capital depreciation
VDFP	$c \times a \times r$	domestic purchases, by firms, at producer prices
VDFB	$c \times a \times r$	domestic purchases, by firms, at basic prices
VDGP	$c \times r$	domestic purchases, by government, at producer prices
VDGB	$c \times r$	domestic purchases, by government, at basic prices
VDPP	$c \times r$	domestic purchases, by households, at producer prices
VDPB	$c \times r$	domestic purchases, by households, at basic prices
EVFB	$e \times a \times r$	primary factor purchases, by firms, at basic prices
VMFP	$c \times a \times r$	import purchases, by firms, at producer prices
VMFB	$c \times a \times r$	import purchases, by firms, at basic prices
VMGP	$c \times r$	import purchases, by government, at producer prices
VMGB	$c \times r$	import purchases, by government, at basic prices
VMSB	$c \times r \times r$	imports, at basic prices
VMPP	$c \times r$	import purchases, by households, at producer prices
VMPB	$c \times r$	import purchases, by households, at basic prices
VCIF	$c \times r \times r$	imports, at CIF prices
VKB	r	capital stock
VRRV	$c \times r \times r$	export subsidy equivalent of voluntary export restraints
VST	$c \times r$	margin exports
VMTS	$t \times c \times r \times r$	import tariff revenue by type of tariff paid
VTWR	$m \times c \times r \times r$	margins by margin commodity
VXSB	$c \times r \times r$	non-margin exports, at basic prices
VFOB	$c \times r \times r$	non-margin exports, at FOB prices
XTRV	$c \times r \times r$	ordinary export tax
VDIB	$c \times r$	domestic purchases, by investment, at basic prices
VDIP	$c \times r$	domestic purchases, by investment, at producer prices
VMIB	$c \times r$	import purchases, by investment, at basic prices
VMIP	$c \times r$	import purchases, by investment, at producer prices
MAKS	$c \times a \times r$	multi-production ('make') matrix at supply prices
MAKB	$c \times a \times r$	multi-production ('make') matrix at basic prices

^a c number of commodities; r number of regions; e number of primary factors; a number of activities; t is the tariff type; m number of margin commodities (sectors).

Table 2.14: The 163 countries/regions in GTAP 12.

No.	Code	Name
1	AUS	Australia
		Christmas Island
		Cocos (Keeling) Islands
		Heard Island and McDonald Islands
		Norfolk Island
2	NZL	New Zealand
3	XOC	Rest of Oceania
		American Samoa
		Cook Islands
		Fiji
		French Polynesia
		Guam
		Kiribati
		Marshall Islands
		Micronesia (Federated States of)
		Nauru
		New Caledonia
		Niue
		Northern Mariana Islands
		Palau
		Papua New Guinea
		Pitcairn
		Samoa
		Solomon Islands
		Tokelau
		Tonga
		Tuvalu
		United States Minor Outlying Islands
		Vanuatu
		Wallis and Futuna Islands
4	CHN	China
5	HKG	Hong Kong
6	JPN	Japan
7	KOR	Korea, Republic of
8	MNG	Mongolia
9	TWN	Chinese Taipei
10	XEA	Rest of East Asia
		Macao
		Democratic People's Republic of Korea
11	BRN	Brunei Darussalam
12	KHM	Cambodia
13	IDN	Indonesia
14	LAO	Lao PDR
15	MYS	Malaysia
16	PHL	Philippines
17	SGP	Singapore
18	THA	Thailand
19	VNM	Viet Nam
20	XSE	Rest of Southeast Asia

Continued ...

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No.	Code	Name
		Myanmar
		TimorLeste
21	AFG	Afghanistan
22	BGD	Bangladesh
23	IND	India
24	NPL	Nepal
25	PAK	Pakistan
26	LKA	Sri Lanka
27	XSA	Rest of South Asia
		Bhutan
		Maldives
28	CAN	Canada
29	USA	United States of America
30	MEX	Mexico
31	XNA	Rest of North America
		Bermuda
		Greenland
		Saint Pierre and Miquelon
32	ARG	Argentina
33	BOL	Bolivia
34	BRA	Brazil
35	CHL	Chile
36	COL	Colombia
37	ECU	Ecuador
38	PRY	Paraguay
39	PER	Peru
40	URY	Uruguay
41	VEN	Venezuela (Bolivarian Republic of)
42	XSM	Rest of South America
		Falkland Islands (Malvinas)
		French Guiana
		Guyana
		South Georgia and the South Sandwich Islands
		Suriname
43	CRI	Costa Rica
44	GTM	Guatemala
45	HND	Honduras
46	NIC	Nicaragua
47	PAN	Panama
48	SLV	El Salvador
49	XCA	Rest of Central America
		Belize
50	DOM	Dominican Republic
51	HTI	Haiti
52	JAM	Jamaica
53	PRI	Puerto Rico
54	TTO	Trinidad and Tobago
55	XCB	Rest of Caribbean
		Anguilla
		Antigua and Barbuda
		Aruba

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No.	Code	Name
		Bahamas
		Barbados
		Bonaire, Sint Eustatius and Saba
		British Virgin Islands
		Cayman Islands
		Cuba
		Curaçao
		Dominica
		Grenada
		Montserrat
		Saint Barthélemy
		Saint Kitts and Nevis
		Saint Lucia
		Saint Martin (French Part)
		Saint Vincent and the Grenadines
		Sint Maarten (Dutch part)
		Turks and Caicos Islands
		United States Virgin Islands
56	AUT	Austria
57	BEL	Belgium
58	BGR	Bulgaria
59	HRV	Croatia
60	CYP	Cyprus
61	CZE	Czech Republic
62	DNK	Denmark
63	EST	Estonia
64	FIN	Finland
		Åland Islands
65	FRA	France
		Guadeloupe
		Martinique
		Réunion
66	DEU	Germany
67	GRC	Greece
68	HUN	Hungary
69	IRL	Ireland
70	ITA	Italy
71	LVA	Latvia
72	LTU	Lithuania
73	LUX	Luxembourg
74	MLT	Malta
75	NLD	Netherlands
76	POL	Poland
77	PRT	Portugal
78	ROU	Romania
79	SVK	Slovakia
80	SVN	Slovenia
81	ESP	Spain
82	SWE	Sweden
83	GBR	United Kingdom
84	CHE	Switzerland

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No.	Code	Name
85	NOR	Norway
		Svalbard and Jan Mayen Islands
86	XEF	Rest of European Free Trade Association
		Iceland
		Liechtenstein
87	ALB	Albania
88	SRB	Serbia
89	BLR	Belarus
90	RUS	Russian Federation
91	UKR	Ukraine
92	XEE	Rest of Eastern Europe
		Republic of Moldova
93	XER	Rest of Europe
		Andorra
		Bosnia and Herzegovina
		Faroe Islands
		Gibraltar
		Guernsey
		Holy See
		Isle of Man
		Jersey
		Kosovo
		Monaco
		Montenegro
		North Macedonia
		San Marino
		Sark
94	KAZ	Kazakhstan
95	KGZ	Kyrgyzstan
96	TJK	Tajikistan
97	UZB	Uzbekistan
98	XSU	Rest of Former Soviet Union
		Turkmenistan
99	ARM	Armenia
100	AZE	Azerbaijan
101	GEO	Georgia
102	BHR	Bahrain
103	IRN	Iran, Islamic Republic of
104	IRQ	Iraq
105	ISR	Israel
106	JOR	Jordan
107	KWT	Kuwait
108	LBN	Lebanon
109	OMN	Oman
110	PSE	Palestinian Territory, Occupied
111	QAT	Qatar
112	SAU	Saudi Arabia
113	SYR	Syrian Arab Republic
114	TUR	Türkiye
115	ARE	United Arab Emirates
116	XWS	Rest of Western Asia

Continued ...

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No.	Code	Name
		Yemen
117	DZA	Algeria
118	EGY	Egypt
119	MAR	Morocco
120	TUN	Tunisia
121	XNF	Rest of North Africa
		Libya
		Western Sahara
122	BEN	Benin
123	BFA	Burkina Faso
124	CMR	Cameroon
125	CIV	Côte d'Ivoire
126	GHA	Ghana
127	GIN	Guinea
128	MLI	Mali
129	MRT	Mauritania
130	NER	Niger
131	NGA	Nigeria
132	SEN	Senegal
133	TGO	Togo
134	XWF	Rest of Western Africa
		Cabo Verde
		Gambia
		GuineaBissau
		Liberia
		Saint Helena
		Sierra Leone
135	AGO	Angola
136	CAF	Central African Republic
137	TCO	Chad
138	COG	Congo
139	COD	Democratic Republic of the Congo
140	GNQ	Equatorial Guinea
141	GAB	Gabon
142	STP	São Tomé and Príncipe
143	BDI	Burundi
144	COM	Comoros
145	ETH	Ethiopia
146	KEN	Kenya
147	MDG	Madagascar
148	MWI	Malawi
149	MUS	Mauritius
150	MOZ	Mozambique
151	RWA	Rwanda
152	SDN	Sudan
153	TZA	Tanzania, United Republic of
154	UGA	Uganda
155	ZMB	Zambia
156	ZWE	Zimbabwe
157	XEC	Rest of Eastern Africa
		Djibouti

Continued ...

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No.	Code	Name
		Eritrea
		Mayotte
		Seychelles
		Somalia
		South Sudan
158	BWA	Botswana
159	SWZ	Eswatini
160	NAM	Namibia
161	ZAF	South Africa
162	XSC	Rest of South African Customs Union
		Lesotho
163	XTW	Rest of the World
		Antarctica
		Bouvet Island
		British Indian Ocean Territory
		French Southern Territories