

Chapter 8.F

Representative Table and Composite Regions

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This chapter describes three sets of regional groupings that are used in the construction of the GTAP Data Base, namely: the representative region, geographic regions, and composite regions. Input-output tables are constructed for the representative region and for composite regions. A classification of the global economy into a few large geographic regions is used in constructing I-O tables for the composite regions and in filling in missing macroeconomic data (see chapter 6).

8.F.1 Representative Table

The representative table is an I-O table created as a linear combination of the set of I-O tables which have full sectoral disaggregation. Ideally, the regions comprising the representative table should represent the broad spectrum of economic development and geographic location of the regions in the data base. Table 8.F.1 provides the list of 39 regions whose I-O tables form the representative I-O table used in the GTAP 7 Data Base.

The representative I-O table is used in several stages in the data base construction process. In the initial stage of checking contributed I-O tables, cost and use shares calculated from an I-O table submitted to GTAP are compared to those from the representative table to identify highly unusual shares and possible errors in the contributed I-O table. Once an I-O table is found to be acceptable and is included in the GTAP data construction process, the I-O table undergoes an initial cleaning procedure where the representative table is used as the source of scaling factors which are then used in revising abnormal or infeasible values in the initial I-O table.

The representative table is also used in the I-O table disaggregation procedure (chapter 8.D). For sectors that are not split in the original I-O table, the structure of production, intermediate usage, and consumption are adapted from the representative table. This is true for the non-agricultural sectors. We use agricultural I-O data for disaggregating agriculture (see chapter 8.A).

8.F.2 Geographic Regions

In the GTAP 7 Data Base, the global economy is represented by 113 regions, 94 of which are regions for which national I-O data are available (referred to as primary regions) and 19 are composite regions. Dividing the global economy into a fewer number of geographic regions is useful in certain aspects of the data base construction. In generating a complete macroeconomic dataset, for each geographic region, averages of the shares of GDP aggregates to total GDP for countries with available data are used for filling in estimates of the GDP aggregates for countries with missing data (see Chapter 6). As discussed in the next section, geographic regions are also used in the construction of I-O tables for composite regions.

Table 8.F.1 Primary Regions Included in the Representative I-O Table

GTAP Regions		GTAP Regions		GTAP Regions	
AUS	Australia	GRC	Greece	POL	Poland
JPN	Japan	IRL	Ireland	ROM	Romania
KOR	Korea	ITA	Italy	SVK	Slovakia
BGD	Bangladesh	NLD	Netherlands	SVN	Slovenia
USA	United States	PRT	Portugal	EST	Estonia
COL	Colombia	ESP	Spain	LVA	Latvia
AUT	Austria	SWE	Sweden	RUS	Russian Federation
BEL	Belgium	BGR	Bulgaria	BWA	Botswana
DNK	Denmark	HRV	Croatia	MWI	Malawi
FIN	Finland	CYP	Cyprus	MOZ	Mozambique
FRA	France	CZE	Czech Republic	TZA	Tanzania
DEU	Germany	HUN	Hungary	ZMB	Zambia
GBR	United Kingdom	MLT	Malta	ZWE	Zimbabwe

The set of 19 geographic regions given in table 8.F.2 are used in constructing the macroeconomic dataset. Table 8.F.3 provides a mapping between the 19 geographic groups and the 226 standard countries.

Table 8.F.2 Geographic Regions used in GTAP Data Construction

Region Code	Description	Region Code	Description
OCEN	Oceania	NEUR	Northern Europe
EAAS	Eastern Asia	WEUR	Western Europe
SEAS	South-eastern Asia	EEUR	Eastern Europe
STAS	Southern Asia	SEUR	Southern Europe
CEAS	Central Asia	NAFR	Northern Africa
WEAS	Western Asia	WAFR	Western Africa
NAMR	North America	CAFR	Central Africa
CARB	Caribbean	EAFR	Eastern Africa
CAMR	Central America	SAFR	Southern Africa
SAMR	South America		

Note: In constructing I-O tables for composite regions, the Caribbean, Central America, and South America are combined into Latin America and Western, Central, Eastern and Southern Africa are combined into Sub-Saharan Africa.

Because of the constraint imposed by the unavailability of a single I-O table for any of the countries included in a geographic region such as the Caribbean, a smaller set of 15 geographic regions is used in constructing the composite regions. This was done by classifying the Caribbean, Central America, and South America together as the larger Latin America region and defining the larger Sub-Saharan Africa region as composed of Eastern Africa, Central Africa, Western Africa, and Southern Africa.

8.F.3 *Composite Regions*

The GTAP 7 Data Base includes contributed I-O tables for 94 of the total of 113 regions. The I-O data for these primary regions are used to construct I-O tables for the 19 composite regions which account for the rest of the economies in the world.

Some significant changes related to composite regions were introduced in the construction of the GTAP 7 Data Base. The regions Rest of Free Trade Area of the Americas (XFA) and Rest of Caribbean (XCB) were merged into a single region XCB. The region Rest of COMESA (XCS) was eliminated by being merged with the region Rest of Sub-Saharan Africa (XSS). Further, the region XSS is split into Rest of Eastern Africa (XEC), Rest of West Africa (XWS), Central Africa (XCF) and South-Central Africa (XAC). Similarly, the region Rest of Soviet Union (XSU) was split into XSU and Rest of Eastern Europe (XEE).

It should be noted that although we continue to use the same names as some composite regions in the GTAP 6 Data Base, the composition of some of these regions have changed and now includes a lesser number of countries. Thus, for example, the I-O table for the composite region Rest of Central America (XCA) is constructed only from the I-O tables of Latin American countries such as Colombia, Peru, Brazil, Chile, etc. We assume here that the average patterns of production, consumption, and savings in any individual country in the 19 composite regions can be approximated by patterns observed in one of its neighboring primary regions. Table 8.F.4 reports the primary region I-O table sources for all the composite regions in the data base.

In constructing an I-O table for a composite region, we start by associating a primary region to each of the member countries in a composite region. The steps involved in the procedure are:

- all the 226 standard countries are matched on the basis of similarity in GDP per capita with a primary region within the same geographic region
- the target total GDP is generated for each composite region; this is the sum of GDP for the individual countries comprising the composite region
- the primary regions matching the countries in the composite region in terms of similarity in GDP per capita are noted and GDP weights (ratio of country GDP to total target GDP) are assigned to each primary region
- the I-O table for each composite region is constructed by combining the I-O data from the primary region tables summed according to the GDP share weights.

The I-O tables for the composite regions are then updated and adjusted to match aggregated regional data on macroeconomic aggregates, trade, protection, and energy in the FIT procedure documented in chapter 15.

Table 8.F.3 Geographic Regions and Mapping

OCEN	Oceania	
	American Samoa	ASM
	Australia	AUS
	Cook Islands	COK
	Fiji	FJI
	French Polynesia	PYF
	Guam	GUM
	Kiribati	KIR
	Marshall Islands	MHL
	Micronesia, Federated States of	FSM
	Nauru	NRU
	New Caledonia	NCL
	New Zealand	NZL
	Niue	NIU
	Norfolk Island	NFK
	Northern Mariana Islands	MNP
	Palau	PLW
	Papua New Guinea	PNG
	Samoa	WSM
	Solomon Islands	SLB
	Tokelau	TKL
	Tonga	TON
	Tuvalu	TUV
	Vanuatu	VUT
	Wallis and Futuna	WLF
EAAS	East Asia	
	China	CHN
	Hong Kong	HKG
	Korea, Democratic People's Republic of	PRK
	Korea, Republic of	KOR
	Macau	MAC
	Mongolia	MNG
	Taiwan	TWN
	Japan	JPN
SEAS	South-Eastern Asia	
	Brunei Darussalam	BRN
	Cambodia	KHM
	Indonesia	IDN
	Lao People's Democratic Republic	LAO
	Malaysia	MYS
	Myanmar	MMR
	Philippines	PHL
	Singapore	SGP
	Thailand	THA

Table 8.F.3 Geographic Regions and Mapping

OCEN	Oceania	
	Timor Leste	TLS
	Vietnam	VNM

Table 8.F.3 Geographic Regions and Mapping (Cont'd)

STAS	Southern Asia	
	Afghanistan	AFG
	Bangladesh	BGD
	Bhutan	BTN
	India	IND
	Iran, Islamic Republic of	IRN
	Maldives	MDV
	Nepal	NPL
	Pakistan	PAK
	Sri Lanka	LKA
CEAS	Central Asia	
	Kazakhstan	KAZ
	Kyrgyzstan	KGZ
	Tajikistan	TJK
	Turkmenistan	TKM
	Uzbekistan	UZB
WEAS	Western Asia	
	Armenia	ARM
	Azerbaijan	AZE
	Bahrain	BHR
	Cyprus	CYP
	Georgia	GEO
	Iraq	IRQ
	Israel	ISR
	Jordan	JOR
	Kuwait	KWT
	Lebanon	LBN
	Oman	OMN
	Palestinian Territory, Occupied	PSE
	Qatar	QAT
	Saudi Arabia	SAU
	Syrian Arab Republic	SYR
	Turkey	TUR
	United Arab Emirates	ARE
	Yemen	YEM
NAMR	North America	
	Bermuda	BMU
	Canada	CAN
	Greenland	GRL
	Saint Pierre and Miquelon	SPM
	United States of America	USA
LAMR	Latin America	
	CARB	
	Caribbean	
	Aruba	ABW
	Anguilla	AIA
	Netherlands Antilles	ANT

Antigua & Barbuda	ATG
Bahamas	BHS
Barbados	BRB
Cuba	CUB
Cayman Islands	CYM
Dominica	DMA

Table 8.F.3 Geographic Regions and Mapping (Cont'd)

	Dominican Republic	DOM
	Guadeloupe	GLP
	Grenada	GRD
	Haiti	HTI
	Jamaica	JAM
	Saint Kitts and Nevis	KA
	Saint Lucia	LCA
	Montserrat	MSR
	Martinique	MTQ
	Puerto Rico	PRI
	Turks and Caicos	TCA
	Trinidad and Tobago	TTO
	Saint Vincent and the Grenadines	VCT
	Virgin Islands, British	VGB
	Virgin Islands, U.S.	VIR
CAMR	Central America	
	Belize	BLZ
	Costa Rica	CRI
	Guatemala	GTM
	Honduras	HND
	Mexico	MEX
	Nicaragua	NIC
	Panama	PAN
	El Salvador	SLV
SAMR	South America	
	Argentina	ARG
	Bolivia	BOL
	Brazil	BRA
	Chile	CHL
SAMR	South America	
	Colombia	COL
	Ecuador	ECU
	Falkland Islands (Malvinas)	FLK
	French Guiana	GUF
	Guyana	GUY
	Peru	PER
	Paraguay	PRY
	Suriname	SUR
	Uruguay	URY
	Venezuela	VEN
WEUR	Western Europe	
	Austria	AUT
	Belgium	BEL
	France	FRA
	Germany	DEU

Liechtenstein	LEI
Luxembourg	LUX
Monaco	MCO
Netherlands	NLD
Switzerland	CHE

Table 8.F.3 Geographic Regions and Mapping (Cont'd)

NEUR	Northern Europe	
	Denmark	DNK
	Estonia	EST
	Faroe Islands	FRO
	Finland	FIN
	Iceland	ISL
	Ireland	IRL
	Latvia	LVA
	Lithuania	LTU
	Norway	NOR
	Sweden	SWE
	United Kingdom	GBR
SEUR	Southern Europe	
	Albania	ALB
	Andorra	AND
	Bosnia and Herzegovina	BIH
	Croatia	HRV
	Gibraltar	GIB
	Greece	GRC
	Italy	ITA
	Macedonia, the former Yugoslav Republic of	MKD
	Malta	MLT
	Portugal	PRT
	San Marino	SMR
	Serbia and Montenegro	SCG
	Slovenia	SVN
	Spain	ESP
EEUR	Eastern Europe	
	Belarus	BLR
	Bulgaria	BGR
	Czech Republic	CZE
	Hungary	HUN
	Moldova, Republic of	MDA
	Poland	POL
	Romania	ROM
	Russian Federation	RUS
	Slovakia	SVK
	Ukraine	UKR
NAFR	Northern Africa	
	Algeria	DZA
	Egypt	EGY
	Libyan Arab Jamahiriya	LBY

Morocco
Tunisia

MAR
TUN

Table 8.F.3 Geographic Regions and Mapping (Cont'd)

SSAF	Sub-Saharan Africa	
	WAFR	Western Africa
		Benin
		Burkina Faso
		Cote d'Ivoire
		Cape Verde
		Ghana
		Guinea
		Gambia
		Guinea-Bissau
		Liberia
		Mali
		Mauritania
		Niger
		Nigeria
		Senegal
		Saint Helena
		Sierra Leone
		Togo
	CAFR	Central Africa
		Angola
		Central African Republic
		Cameroon
		Congo, the Democratic Republic of the
		Congo
		Gabon
		Equatorial Guinea
		Sao Tome and Principe
		Chad
	EAFR	Eastern Africa
		Burundi
		Comoros
		Djibouti
		Eritrea
		Ethiopia
		Kenya
		Madagascar
		Mozambique
		Mauritius
		Malawi
		Mayotte
		Reunion
		Rwanda

Sudan	SDN
Somalia	SOM
Seychelles	SYC
Tanzania, United Republic of	TZA
Uganda	UGA
Zambia	ZMB
Zimbabwe	ZWE

Table 8.F.3 Geographic Regions and Mapping (Cont'd)

SAFR	Southern Africa	
	Botswana	BWA
	Lesotho	LSO
	Namibia	NAM
	Swaziland	SWZ
	South Africa	ZAF

Table 8.F.4 Primary Regions Input-Output Sources for Composite Region Tables

Composite Region/Component Countries			Primary Region Match		GDP Share Weights
XOC	Rest of Oceania				100.00
	American Samoa	ASM	New Zealand	NZL	100.00
	Cook Islands	COK			
	Fiji	FJI			
	French Polynesia	PYF			
	Guam	GUM			
	Kiribati	KIR			
	Marshall Islands	MHL			
	Micronesia, Federated States of	FSM			
	Nauru	NRU			
	New Caledonia	NCL			
	Norfolk Island	NFK			
	Northern Mariana Islands	MNP			
	Niue	NIU			
	Palau	PLW			
	Papua New Guinea	PNG			
	Samoa	WSM			
	Solomon Islands	SLB			
	Tokelau	TKL			
	Tonga	TON			
	Tuvalu	TUV			
	Vanuatu	VUT			
	Wallis and Futuna	WLF			
XEA	Rest of East Asia				100.00
	Macau	MAC	China	CHN	59.80
	Mongolia	MNG	Hong Kong	HKG	40.20
	Korea, Democratic People's Republic of	PRK			
XSE	Rest of Southeast Asia				100.00

Table 8.F.4 Primary Regions Input-Output Sources for Composite Region Tables

Composite Region/Component Countries			Primary Region Match		GDP Share Weights
	Brunei Darussalam	BRN	Singapore	SGP	93.90
	Timor Leste	TLS	Cambodia	KHM	6.10
XSA	Rest of South Asia				100.00
	Afghanistan	AFG	Bangladesh	BGD	89.70
	Bhutan	BTN	Pakistan	PAK	4.80
	Maldives	MDV	Iran	IRN	5.40
	Nepal	NPL			Continued...
XNA	Rest of North America				100.00
	Bermuda	BMU	Canada	CAN	29.70
	Greenland	GRL	USA	USA	70.30
	Saint Pierre and Miquelon	SPM			
XSM	Rest of South America				100.00
	Falkland Islands (Malvinas)	FLK	Mexico	MEX	46.18
	French Guiana	GUF	Bolivia	BOL	22.32
	Guyana	GUY	Peru	PER	31.50
	Suriname	SUR			
XCA	Central America				100.00
	Belize	BLZ	Bolivia	BOL	30.77
	El Salvador	SLV	Ecuador	ECU	65.34
	Honduras	HND	Brazil	BRA	3.89
XCB	Rest of the Caribbean				100.00
	Antigua & Barbuda	ATG	Mexico	MEX	66.36
	Bahamas	BHS	Argentina	ARG	0.14
	Barbados	BRB	Brazil	BRA	22.64
	Dominica	DMA	Chile	CHL	0.03
	Dominican Republic	DOM	Venezuela	VEN	0.23
	Grenada	GRD	Costa Rica	CRI	0.40
	Haiti	HTI	Nicaragua	NIC	1.83
	Jamaica	JAM			
	Puerto Rico	PRI			
	Saint Kitts and Nevis	KNA			
	Saint Lucia	LCA			
	Saint Vincent and the Grenadines	VCT			
	Trinidad and Tobago	TTO			
	Virgin Islands, U.S.	VIR			
	Anguilla	AIA			
	Aruba	ABW			
	Cayman Islands	CYM			
	Cuba	CUB			
	Guadeloupe	GLP			
	Martinique	MTQ			
	Montserrat	MSR			
	Netherlands Antilles	ANT			
	Turks and Caicos	TCA			
	Virgin Islands, British	VGB			
XEF	Rest of EFTA				100.00
	Iceland	ISL	Ireland	IRL	0.78
	Liechtenstein	LIE	Luxembourg	LUX	0.22
XEE	Rest of Eastern Europe				100.00

Table 8.F.4 Primary Regions Input-Output Sources for Composite Region Tables

Composite Region/Component Countries			Primary Region Match		GDP Share Weights
	Moldova, Republic of	MDA	Ukraine	UKR	100.00
XER	Rest of Europe				100.00
	Andorra	AND	Finland	FIN	3.78
	Bosnia and Herzegovina	BIH	Italy	ITA	9.44
	Faroe Islands	FRO	Netherlands	NLD	2.56
	Gibraltar	GIB	Albania	ALB	84.23

Table 8.F.4 Primary Regions Input-Output Sources for Composite Region Tables (Cont'd)

Composite Region/Component Countries			Primary Region Match		GDP Share Weights
	Macedonia, the former Yugoslav Republic of	MKD			
	Monaco	MCO			
	San Marino	SMR			
	Serbia and Montenegro	SCG			
XSU	Rest of Former Soviet Union				100.00
	Tajikistan	TJK	Kazakhstan	KAZ	30.53
	Turkmenistan	TKM	Kyrgyzstan	KGZ	69.47
	Uzbekistan	UZB			
XWS	Rest of West Asia				100.00
	Bahrain	BHR	Cyprus	CYP	85.68
	Iraq	IRQ	Armenia	ARM	4.93
	Israel	ISR	Georgia	GEO	2.37
	Jordan	JOR	Azerbaijan	AZE	3.87
	Kuwait	KWT	Turkey	TUR	3.15
	Lebanon	LBN			
	Palestinian Territory, Occupied	PSE			
	Oman	OMN			
	Qatar	QAT			
	Saudi Arabia	SAU			
	Syrian Arab Republic	SYR			
	United Arab Emirates	ARE			
	Yemen	YEM			
XNF	Rest of North Africa				100.00
	Algeria	DZA	Tunisia	TUN	100.00
	Libyan Arab Jamahiriya	LYB			
XSC	Rest of South African Customs Union				100.00
	Lesotho	LSO	South Africa	ZAF	85.24
	Namibia	NAM	Zambia	ZMB	14.76
	Swaziland	SWZ			
XWF	Rest of West Africa				100.00
	Benin	BEN	Nigeria	NGA	68.84
	Burkina Faso	BFA	Senegal	SEN	31.16
	Cote d'Ivoire	CIV			
	Cape Verde	CPV			
	Ghana	GHA			
	Guinea	GIN			
	Gambia	GMB			
	Guinea-Bissau	GNB			
	Liberia	LBR			
	Mali	MLI			
	Mauritania	MRT			
	Niger	NER			
	Saint Helena	SHN			
	Sierra Leone	SLE			
	Togo	TGO			

Table 8.F.4 Primary Regions Input-Output Sources for Composite Region Tables (Cont'd)

Composite Region/Component Countries			Primary Region Match		GDP Share Weights
XCF	Central Africa				100.00
	Central African Republic	CAF	Zambia	ZMB	66.54
	Cameroon	CMR	Zimbabwe	ZWE	3.50
	Congo	COG	Botswana	BWA	29.96
	Gabon	GAB			
	Equatorial Guinea	GNQ			
	Sao Tome and Principe	STP			
	Chad	TCS			
XAC	Rest of South-Central Africa				100.00
	Angola	AGO	Zambia	ZMB	72.25
	Congo, the Democratic Republic of the	COD	Malawi	MWI	27.75
XEC	Rest of East Africa				100.00
	Burundi	BDI	Ethiopia	ETH	1.35
	Comoros	COM	Madagascar	MDG	5.52
	Djibouti	DJI	Uganda	UGA	4.16
	Eritrea	ERI	Zambia	ZMB	76.18
	Kenya	KEN	Botswana	BWA	12.79
	Mayotte	MYT			
	Reunion	REU			
	Rwanda	RWA			
	Sudan	SDN			
	Somalia	SOM			