

Chapter 14

Representative Table and Composite Regions

Betina V. Dimaranan

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 18.1).

14.1 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 14.1 provides the list of 39 regions whose I-O tables form the representative I-O table used in the GTAP 6 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 13). 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 12.A).

14.2 Geographic Regions

In the GTAP 6 Data Base, the global economy is represented by 87 regions, 69 of which are regions for which national I-O data are available (referred to as primary regions) and 18 are composite regions. Dividing the global economy into a fewer number of geographic regions is useful in certain

Table 14.1 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

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 18.1). As discussed in the next section, geographic regions are also used in the construction of I-O tables for composite regions.

The set of 18 geographic regions given in table 14.2 are used in constructing the macroeconomic dataset. Table 14.3 provides a mapping between the 18 geographic groups and the 226 standard countries. 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 13 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.

Table 14.2 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
SCAS	South-central Asia	SEUR	Southern Europe
WEAS	Western Asia	NAFR	Northern Africa
NAMR	North America	WAFR	Western Africa
CARB	Caribbean	CAFR	Central Africa
CAMR	Central America	EAFR	Eastern Africa
SAMR	South America	SAFR	Southern Africa

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.

14.3 Composite Regions

The GTAP 6 Data Base includes contributed I-O tables for 69 of the 87 regions. The I-O data for these primary regions are used to construct I-O tables for the 11 composite regions which account for the rest of the economies in the world.

Two significant changes related to composite regions were introduced in the construction of the GTAP 6 Data Base. First, the Rest of World region (XRW), which served as a residual for the regions that were not grouped with the other composite regions in the GTAP 5 Data Base, was eliminated in the GTAP 6 Data Base. The regions in the previous XRW were then included in other existing composite regions or grouped in new composite regions. In addition, new composite regions were formed to facilitate ease in creating aggregations for the analysis of various preferential arrangements. Thus the former Central America and the Caribbean (XCM) region in GTAP 5 was split into three composite regions – Central America (XCA), Rest of the Free Trade Area of the Americas (XFA), and Rest of the Caribbean (XCB). The other new composite regions in GTAP 6 are Rest of Oceania (XOC), Rest of East Asia (XEA), Rest of South East Asia (XSE), Rest of North America (XNA), Rest of EFTA (XEF), and Rest of Europe (XER).

It should be noted that although we continue to use the same names as some composite regions in the GTAP 5 Data Base, the composition of some of these regions have changed and now includes a lesser number of countries. This is true for the Rest of the Former Soviet Union (XSU), Rest of North Africa (XNF), and the Rest of Southern Africa Customs Union (XSC). The composition of the previous Rest of Other Southern Africa (XSF) was revised and the region is now called Rest of SADC (XSD).

Input-output tables for the composite regions are constructed from the I-O tables of primary regions which have similar GDP per capita as the countries that comprise the composite regions. In constructing the I-O tables for composite regions in GTAP 5, we generally allowed the mapping of countries in the composite region to a primary region anywhere in the world. In GTAP 6, we revised this procedure such that we match the countries in a composite region only to primary regions within its geographic area using the 13 geographic areas given in Table 14.2. Thus, for example, the I-O table for the composite region Central America is constructed only from the I-O tables of Latin American countries (Colombia, Peru, Brazil, and Chile). We assume here that the average patterns of production, consumption, and savings in any individual country in the 11 composite regions can be approximated by patterns observed in one of its neighboring primary regions. Table 14.4 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 19.

Table 14.3 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
	Japan	JPN
	Korea, Democratic People's Republic of	PRK
	Korea, Republic of	KOR
	Macau	MAC
	Mongolia	MNG
	Taiwan	TWN

Continued

Table 14.3 Geographic Regions and Mapping (Contd)

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
	Timor Leste	TLS
	Viet Nam	VNM
SCAS	South-Central Asia	
	Afghanistan	AFG
	Bangladesh	BGD
	Bhutan	BTN
	India	IND
	Iran, Islamic Republic of	IRN
	Iraq	IRQ
	Kazakhstan	KAZ
	Kyrgyzstan	KGZ
	Maldives	MDV
	Nepal	NPL
	Pakistan	PAK
	Sri Lanka	LKA
	Tajikistan	TJK
	Turkmenistan	TKM
	Uzbekistan	UZB
WEAS	Western Asia	
	Armenia	ARM
	Azerbaijan	AZE
	Bahrain	BHR
	Cyprus	CYP
	Georgia	GEO
	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

Continued

Table 14.3 Geographic Regions and Mapping (Contd)

Table 14.3 Geographic Regions and Mapping (Contd)		
NAMR	North America (Contd)	
	Mexico	MEX
	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
	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
	Nicaragua	NIC
	Panama	PAN
	El Salvador	SLV
	SAMR	South America
	Argentina	ARG
	Bolivia	BOL
	Brazil	BRA
	Chile	CHL
	Colombia	COL
	Ecuador	ECU
	Falkland Islands (Malvinas)	FLK
	French Guiana	GUF
	Guyana	GUY
	Peru	PER

Continued

Table 14.3 Geographic Regions and Mapping (Contd)

SAMR	South America (Contd)	
	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
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

Continued

Table 14.3 Geographic Regions and Mapping (Contd)

EEUR	Eastern Europe (Contd)	
	Romania	ROM
	Russian Federation	RUS
	Slovakia	SVK
	Ukraine	UKR
NAFR	Northern Africa	
	Algeria	DZA
	Egypt	EGY
	Libyan Arab Jamahiriya	LBY
	Morocco	MAR
	Tunisia	TUN
SSAF	Sub-Saharan Africa	
	WAFR	Western Africa
	Benin	BEN
	Burkina Faso	BFA
	Cote d'Ivoire	CIV
	Cape Verde	CPV
	Ghana	GHA
	Guinea	GIN
	Gambia	GMB
	Guinea-Bissau	GNB
	Liberia	LBR
	Mali	MLI
	Mauritania	MRT
	Niger	NER
	Nigeria	NGA
	Senegal	SEN
	Saint Helena	SHN
	Sierra Leone	SLE
	Togo	TGO
	CAFR	Central Africa
	Angola	AGO
	Central African Republic	CAF
	Cameroon	CMR
	Congo, the Democratic Republic of the	COD
	Congo	COG
	Gabon	GAB
	Equatorial Guinea	GNQ
	Sao Tome and Principe	STP
	Chad	TCS
	EAFR	Eastern Africa
	Burundi	BDI
	Comoros	COM
	Djibouti	DJI
	Eritrea	ERI
	Ethiopia	ETH
	Kenya	KEN
	Madagascar	MDG
	Mozambique	MOZ
	Mauritius	MUS

Continued

Table 14.3 Geographic Regions and Mapping (Contd)

EAFR	Eastern Africa (Contd)	
	Malawi	MWI
	Mayotte	MYT
	Reunion	REU
	Rwanda	RWA
	Sudan	SDN
	Somalia	SOM
	Seychelles	SYC
	Tanzania, United Republic of	TZA
	Uganda	UGA
	Zambia	ZMB
	Zimbabwe	ZWE
SAFR	Southern Africa	
	Botswana	BWA
	Lesotho	LSO
	Namibia	NAM
	Swaziland	SWZ
	South Africa	ZAF

Table 14.4 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	Australia AUS	23.14
	Cook Islands	COK	New Zealand NZL	76.86
	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	78.80
	Mongolia	MNG	Taiwan TWN	21.20
	Korea, Democratic People's Republic of	PRK		
XSE	Rest of Southeast Asia			100.00
	Brunei Darussalam	BRN	Singapore SGP	8.22
	Cambodia	KHM	Thailand THA	84.75
	Lao People's Democratic Republic	LAO	Vietnam VNM	7.03
	Myanmar	MMR		
	Timor Leste	TLS		
XSA	Rest of South Asia			100.00
	Afghanistan	AFG	Bangladesh BGD	6.59
	Bhutan	BTN	India IND	69.56
	Maldives	MDV	Sri Lanka LKA	23.85
	Nepal	NPL		
	Pakistan	PAK		
XNA	Rest of North America			100.00
	Bermuda	BMU	Canada CAN	33.98
	Greenland	GRL	USA USA	66.02
	Saint Pierre and Miquelon	SPM		
XAP	Rest of Andean Pact			100.00
	Bolivia	BOL	Colombia COL	100.00
	Ecuador	ECU		

Continued

Table 14.4 Primary Regions Input-Output Sources for Composite Region Tables (Contd)

Composite Region/Component Countries		Primary Region Match		GDP Share Weights
XSM	Rest of South America			100.00
	Falkland Islands (Malvinas)	FLK	Colombia COL	88.05
	French Guiana	GUF	Argentina ARG	0.76
	Guyana	GUY	Uruguay URY	11.18
	Paraguay	PRY		
	Suriname	SUR		
XCA	Central America			100.00
	Belize	BLZ	Colombia COL	41.81
	Costa Rica	CRI	Peru PER	19.59
	El Salvador	SLV	Brazil BRA	15.65
	Guatemala	GTM	Chile CHL	22.96
	Honduras	HND		
	Nicaragua	NIC		
	Panama	PAN		
XFA	Rest of Free Trade Area of Americas			100.00
	Antigua & Barbuda	ATG	Colombia COL	3.35
	Bahamas	BHS	Peru PER	17.38
	Barbados	BRB	Argentina ARG	71.80
	Dominica	DMA	Brazil BRA	6.59
	Dominican Republic	DOM	Chile CHL	0.87
	Grenada	GRD		
	Haiti	HTI		
	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		
XCB	Rest of the Caribbean			100.00
	Anguilla	AIA	Colombia COL	58.59
	Aruba	ABW	Argentina ARG	41.33
	Cayman Islands	CYM	Chile CHL	0.08
	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	Denmark DNK	95.27
	Liechtenstein	LIE	Netherlands NLD	0.41
	Norway	NOR	Sweden SWE	4.32
XER	Rest of Europe			100.00
	Andorra	AND	Finland FIN	4.23
	Bosnia and Herzegovina	BIH	Italy ITA	11.58
	Faroe Islands	FRO	Switzerland CHE	3.68
	Gibraltar	GIB	Albania ALB	80.52

Continued

Table 14.4 Primary Regions Input-Output Sources for Composite Region Tables (Contd)

Composite Region/Component Countries	Primary Region Match		GDP Share Weights	
XER	Rest of Europe (Contd)			
	Macedonia, the former Yugoslav Republic of	MKD		
	Monaco	MCO		
	San Marino	SMR		
	Serbia and Montenegro	SCG		
XSU	Rest of Former Soviet Union		100.00	
	Armenia	ARM	Bangladesh	BGD
	Azerbaijan	AZE	India	IND
	Belarus	BLR	Sri Lanka	LKA
	Georgia	GEO	Bulgaria	BGR
	Kazakhstan	KAZ	Turkey	TUR
	Kyrgyzstan	KGZ		
	Moldova, Republic of	MDA		
	Tajikistan	TJK		
	Turkmenistan	TKM		
	Ukraine	UKR		
	Uzbekistan	UZB		
XME	Rest of Middle East		100.00	
	Bahrain	BHR	Sri Lanka	LKA
	Iran, Islamic Republic of	IRN	Cyprus	CYP
	Iraq	IRQ	Turkey	TUR
	Israel	ISR		
	Jordan	JOR		
	Kuwait	KWT		
	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	Morocco	MAR
	Egypt	EGY	Tunisia	TUN
	Libyan Arab Jamahiriya	LBY		
XSC	Rest of South African Customs Union		100.00	
	Lesotho	LSO	South Africa	ZAF
	Namibia	NAM	Zambia	ZMB
	Swaziland	SWZ	Zimbabwe	ZWE
XSD	Rest of Southern African Development Community		100.00	
	Angola	AGO	Botswana	BWA
	Congo, the Democratic Republic of the	COD	Malawi	MWI
	Mauritius	MUS	Zimbabwe	ZWE
	Seychelles	SYC		

Continued

Table 14.4 Primary Regions Input-Output Sources for Composite Region Tables (Contd)

Composite Region/Component Countries		Primary Region Match		GDP Share Weights
XSS	Rest of Sub-Saharan Africa			100.00
	Benin	BEN	Botswana BWA	6.95
	Burkina Faso	BFA	South Africa ZAF	0.01
	Burundi	BDI	Malawi MWI	7.84
	Cameroon	CMR	Mozambique MOZ	4.11
	Cape Verde	CPV	Tanzania TZA	5.35
	Central African Republic	CAF	Zambia ZMB	27.89
	Chad	TCD	Zimbabwe ZWE	16.28
	Comoros	COM	Madagascar MDG	29.70
	Congo	COG	Uganda UGA	1.88
	Cote d'Ivoire	CIV		
	Djibouti	DJI		
	Equatorial Guinea	GNQ		
	Eritrea	ERI		
	Ethiopia	ETH		
	Gabon	GAB		
	Gambia	GMB		
	Ghana	GHA		
	Guinea	GIN		
	Guinea-Bissau	GNB		
	Kenya	KEN		
	Liberia	LBR		
	Mali	MLI		
	Mauritania	MRT		
	Mayotte	MYT		
	Niger	NER		
	Nigeria	NGA		
	Reunion	REU		
	Rwanda	RWA		
	Saint Helena	SHN		
	Sao Tome and Principe	STP		
	Senegal	SEN		
	Sierra Leone	SLE		
	Somalia	SOM		
	Sudan	SDN		
	Togo	TGO		