

11.A

Overview of Regional Input-Output Tables

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This chapter documents the input-output (I-O) tables used in constructing the GTAP data base. As noted in chapter 8, the GTAP data base consists mainly of I-O data, and the primary source for this is a large collection of single-country I-O tables contributed to GTAP by researchers around the world. The bulk of this chapter, sub-chapters 11.B to 11.Q, documents these contributors' work. But first in this sub-chapter, 11.A, we describe what's new in the contributed tables in version 5 and the screening and preliminary adjustments we make to the contributed tables.

11.A.1 What's New in Version 5?

Compared with version 4, the GTAP data base has more regional and sectoral detail. Lists of regions and sectors are provided in chapter 8. The additional detail provides considerable scope for users of the GTAP data base to investigate a variety of issues related to these new regions and sectors.

Version 5 of the GTAP data base includes data for 66 regions. Of these 66, 56 are primary regions, developed from contributed I-O tables; the remaining 10 are composite regions. This is a substantial increase over version 4, which contained data for a total of 45 regions. Table 11.A.1 summarizes the sources and reference period for all the regional I-O tables underpinning the version 5 data base.

Table 11.A.1. Sources of I-O tables in GTAP Version 5 Data Base

Reference			
Region	Period	Source of I-O Table	Version 5 contributor(s)
AUS	1993-94	Australian Bureau of Statistics	Andrew Welsh, Ilias Mastoris, and Johanna Travis
NZL	1992-93	Statistics New Zealand (1997)	
CHN	1997	Department of National Economy Accounting, State Statistical Bureau, Chinese Statistics Press	Zhi Wang, Fan Zhai, and Dianqing Xu
HKG	1988	Tormey (1993)	
JPN	1995	Management and Coordination Agency, Japan (1999)	Mantaro Matsuya
KOR	1995	Bank of Korea (1998)	Jong-Hwan Ko and Inkyo Cheong
TWN	1996	Directorate General of Budget, Accounting & Statistics (2000), Taiwan	Hsing-Chun Lin, Lin-Chun Chung, and Ruey-Wan Liou
IDN	1993	Biro Pusat Statistik, Jakarta	
MYS	1983	Department of Statistics (1987), Malaysia	
PHL	1985	National Economic and Development Authority(1988), Philippines	
SGP	1983	Department of Statistics (1987), Singapore	
THA	1990	Institute of Developing Economies, Tokyo and Socio-Economic Policy and Forecasting Unit, Chulalongkorn University Social Research Institute, Thailand	
VNM	1996	Nielson. "Social Accounting Matrices for Vietnam: 1996 and 1997"	Chantal Pohl Nielsen
BGD	1993-94	Bangladesh Planning Commission and Bangladesh Institute of Development Studies (1998)	A.N.K. Noman and Jong-Hwan Ko
IND	1989-90	Central Statistical Organization, Department of Statistics, Ministry of Planning and Program Implementation, India (1997)	Rajesh Chadha and Pratap Devender
LKA	1989	Center of International Economics, Export Development Broad, Colombo, Sri Lanka	Jay Bandara
XSA	1997	COMPOSITE	
CAN	1990	Statistics Canada	
USA	1992 (1996)	U.S. Department of Commerce, Bureau of Economic Analysis (1997)	Kenneth Hanson and Agapi Somwaru
MEX	1995	Secretaria de Pramacion y Presupuesto (1985), Burfisher, Thierfelder, and Hanson (1992)	Mary Burfisher
XCM	1997	COMPOSITE	
COL	1996	National Department of Statistics (DANE)	Ramiro Guerrero

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Table 11.A.1. Sources of I-O tables in GTAP Version 5 Data Base (Continued)

Reference		Source of I-O Table	Version 5 contributor(s)
Region	Period		
PER	n.a.	n.a.	Juan Jose Echavarria & Maria Arbelaez
VEN	1986	Planning Agency (CORDIPLAN), Venezuela	
XAP	1989	COMPOSITE	
ARG	1984	Secretaria de Planificacion(1986), Argentina	
BRA	1985	Fundacao Instituto Brasileiro de Geografia e Estatistica (1995)	
CHL	1986	Central Bank of Chile (1986)	
URY	1983	Banco Central del Uruguay, Departamento de Estadisticas Economicas (1991)	
XSM	1997	COMPOSITE	
AUT	1983 (1995)	Austrian Central Statistical Office, Wien, Austria	Myrna van Leeuwen (LEI)
BEL	1995	Peeters (Limburgs Universitair Centrum LUC-Deipenbeek, Belgium)	Myrna van Leeuwen (LEI)
DNK	1992 (1995)	Statistics Denmark, Copenhagen	Myrna van Leeuwen (LEI)
FIN	1995	Statistics Finland (Leena Kerkela)	Myrna van Leeuwen (LEI)
FRA	1992 (1995)	Institut National de la Statistique et des Etudes Economiques, Paris, France (1996)	Myrna van Leeuwen (LEI)
DEU	1995	Federal Agricultural Research Centre (FAL), Braunschweig, Germany (Martina Brockmeier)	Myrna van Leeuwen (LEI)
GBR	1990	Central Statistical Office, H.M.S.O., 1995	Lionel Hubbard
GRC	n.a.	n.a.	Myrna van Leeuwen (LEI)
IRL	1990 (1995)	Central Statistical Office, Dublin, Ireland (1997)	Myrna van Leeuwen (LEI)
ITA	1992 (1995)	Instituto Nazionale di Statistica, Rome, Italy (1996)	Myrna van Leeuwen (LEI)
LUX	n.a.	n.a.	Myrna van Leeuwen (LEI)
NLD	1995	CBS, LEI, The Hague	Myrna van Leeuwen (LEI)
PRT	1993 (1995)	Instituto Nacional de Estatistica, Lisbon, Portugal (1996)	Myrna van Leeuwen (LEI)
ESP	1994 (1995)	Universidad de Deusto, San Sebastian, Spain (Azier Minondo)	Myrna van Leeuwen (LEI)
SWE	1985 (1995)	Statistiska Centralbyran, Orebro, Sweden (1992)	Myrna van Leeuwen (LEI)
CHE	1990 (1995)	Laboratoire d'economie appliquee, University of Geneva (scaled to 1995 at Swiss Federal Institute of Technology)	Markus Lips and Renger van Nieuwkoop
XEF	1997	COMPOSITE	
HUN	1991 & 1996	Central Statistical Office, Budapest, Hungary (1999)	Martin Banse
POL	1997	Central Statistical Agency, Warsaw, Poland (2000)	Martin Banse

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Table 11.A.1. Sources of I-O tables in GTAP Version 5 Data Base (Continued)

Region	Reference		Version 5 contributor(s)
	Period	Source of I-O Table	
XCE	1987-89	World Bank	
XSU	1989	World Bank	
TUR	1990	State Institute of Statistics (Turkey)	
XME	1997	COMPOSITE	
MAR	1990	Maurizio Bussolo and David Roland-Holst (1993)	
XNF	1997	COMPOSITE	
BWA	1993-94	McDonald	Mark Horridge
XSC	1995	Industrial Development Corporation, South Africa	Mark Horridge
MWI	1994	MERRISA/Wobst	Mark Horridge
MOZ	1995	MERRISA/Arndt et al.	Mark Horridge
TZA	1992	MERRISA/Wobst	Mark Horridge
ZMB	1995	MERRISA/Hausner	Mark Horridge
ZWE	1991	MERRISA/Thomas and Bautista	Mark Horridge
XSF	1997	COMPOSITE	
UGA	1992	Ugandan National Statistics Department (UNSD)	Adam Blake
XSS	1997	COMPOSITE	
XRW	1997	COMPOSITE	

The inclusion of a country in the data base is driven by the needs of the users of the GTAP data base. Country I-O tables are prepared by contributors who have a particular interest in including the country in the data base. Users interested in contributing I-O tables are referred to the GTAP technical paper on this subject (Huff, McDougall, and Walmsley 1999).

In version 5, there has been a considerable increase in the number of new countries added to the data base. Special projects have been undertaken by contributors to expand the coverage of the GTAP data base to include all countries of the European Union; Poland and Hungary; and most of southern Africa. In addition, many of the I-O tables of the countries from version 4 have been updated.

The GTAP data base provides details on 57 sectors – 7 additional services sectors have been added since version 4. Many of the newly contributed I-O tables contain details on all 57 sectors. Only 24 regions required disaggregation – 17 agricultural and all 24 non-agricultural disaggregation. Table 11.A.2 lists the newly contributed I-O tables and the level of disaggregation required.

Table 14.2 Number of Sectors in the New GTAP 5 I-O Tables

Region	Base Year (Updated Year)	Number of Sectors in Original I-O Tables			
		Total	Agriculture	Processed Foods	Manufactures & Services
V5 standard	1997	57	12	8	37
Australia	1993-94	57	12	8	37
China	1997	42	2	3	37
Japan	1995	57	12	8	37
Korea	1995	57	12	8	37
Taiwan	1996	57	12	8	37
Vietnam	1996	45	4	6	35
India	1989-90	57	12	8	37
USA	1992 (1996)	57	12	8	37
Colombia	1996	57	12	8	37
Austria	1983 (1995)	57	12	8	37
Belgium	1995	57	12	8	37
Denmark	1992 (1995)	57	12	8	37
Finland	1995	57	12	8	37
France	1992 (1995)	57	12	8	37
Germany	1995	57	12	8	37
United Kingdom	1990	57	12	8	37
Greece	n.a.	57	12	8	37
Ireland	1990 (1995)	57	12	8	37
Italy	1992 (1995)	57	12	8	37
Luxembourg	n.a.	57	12	8	37
Netherlands	1995	57	12	8	37
Portugal	1993 (1995)	57	12	8	37
Spain	1994 (1995)	57	12	8	37
Sweden	1985 (1995)	57	12	8	37
Switzerland	1990 (1995)	46	12	8	26
Hungary	1991 & 1996	57	12	8	37
Poland	1997	57	12	8	37
Botswana	1993-94	57	12	8	37
South Africa	1995	57	12	8	37
Malawi	1994	57	12	8	37
Mozambique	1995	57	12	8	37
Tanzania	1992	57	12	8	37
Zambia	1995	57	12	8	37
Zimbabwe	1991	57	12	8	37
Uganda	1992	36	3	6	27

Note: Some regions use version 3 data and have 37 sectors of which 6 are in agriculture, 5 in food processing, and 26 in manufactures and services. These regions are Hong Kong, Malaysia, Philippines, Singapore, Canada, Mexico, Argentina, Brazil, Chile, Rest of Central European Associates, and the Former Soviet Union.

You may notice in Table 11.A.1 that the reference periods for the regional I-O tables vary across regions. The reason for this is that I-O tables for most of the regions are available at five-yearly or longer intervals, and they are often published several years after the data have been collected. This means that it is impossible to keep source data up-to-date. Fortunately the I-O coefficients tend to change relatively slowly, and the data are updated to reflect macroeconomic aggregates, trade, energy, and protection targets for 1997. The procedure used to update the I-O tables is described in Chapter 19. We believe that the resulting estimated domestic data bases are of reasonably high quality in almost all cases.

11.A.2 *Checking the I-O Tables*

After receiving an I-O table, we first check that it satisfies certain formal requirements. If there are serious deviations from these requirements, we advise the contributor and request changes. The procedures for checking the I-O tables have been improved and formalized during the production of the version 5 data base. Further details about the checking procedures are provided in Huff et al. (1999).

There are 5 groups of checks made on the I-O tables. These include:

Data structure. This includes a number of checks. Firstly, we ensure that there are at least 30 sectors and that agriculture and energy are separated from other sectors. Second, we check that the contributor has mapped the original data to the sectors according to the concordances; and finally, we ensure that there are no serious data omissions.

Balance condition. Each table should be balanced. A check is made to ensure that total sales equals total costs for each sector in the contributed I-O table.

Sign. There are certain requirements about the signs of elements in the tables. For example, the value of capital services must be positive reflecting the normal return to capital services.

Tax rates. A check is made to ensure that there are no ridiculous tax rates implied by the data.

I-O structure. Finally we compare the I-O structure to that of an average I-O table and investigate any substantial differences to ensure that there are no ridiculous unexplainable entries. This also allows us to check that government and financial services have been treated in the preferred way and is therefore consistent with the other I-O tables.

In general, we require substantive but not rigorous compliance with all these conditions. For example, we accept tables with negative entries in cells that should be non-negative; but only if we judge that the negative values are economically insignificant; that is, that we can remove them without substantially altering the I-O structure. Then, in our initial processing of the tables, we remove these minor defects.

11.A.3 Initial Processing

After the checking process, the I-O tables go through a number of stages before being incorporated into the GTAP data base. First, despite all the preliminary checks made, some cleaning of the I-O tables may be required to remove any minor problems or deviations in sign or balance. Having cleaned the I-O tables as required, we take those that have the full 57-sector GTAP sectoral classification and calculate from them a world representative table as a suitable linear combination, giving each region's I-O table its appropriate GDP weight. The tables that do not have the full 57-sectors, we disaggregate, as described in chapter 13.

For each region where we have no contributed table, we calculate a composite table, as a linear combination of I-O tables for selected primary regions. We make a different selection of primary regions for each composite region, matching as closely as possible the composite region's income level and production pattern, as described in chapter 14.

At this point we have a set of tables covering all GTAP regions. We make some further adjustments to ensure that the I-O table matches the external macroeconomic, trade, protection, and energy data (chapter 19). The I-O tables only contain data on the aggregate value of labor. Using other data sources, we split these values between skilled and unskilled labor, and also revise primary factor usage in agriculture and resource-intensive industries (chapter 18).

11.A.4 Concluding Remarks

So far, we have not mentioned the work undertaken by the contributor in preparing an I-O table for incorporation into the GTAP data base. There are numerous problems and issues that a contributor has to consider when preparing an I-O table. In the remaining sections of this chapter, the contributors provide detailed information about the source of the data, how it was prepared, and any problems encountered and how they were dealt with.

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