

# ***Chapter 8***

## ***Guide to the GTAP data base***

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The GTAP data base is the data base for the GTAP model of the world economy. It covers all the data included in the data package, except the time series trade data (chapter 7). It comprises three files, sets, parameters, and data. Sets and data files are header array files (a GEMPACK binary format), the parameters file a GEMPACK-formatted text file (Harrison and Pearson, 1998). In the GTAP model, data are updatable, in that they typically depend on the state of the world, and change through a GTAP simulation; parameters are invariant within simulations.

The sets file enumerates the GTAP regions and commodities and other sets used in the model. The parameters file contains invariant behavioral parameters. The data file is a representation of the state of the world economy in 1995. It represents the world economy as a system of flows of goods and services, measured as money values. These flows include both input-output flows within each region and bilateral international trade flows. Since most flows are measured at both tax-free and tax-paid prices, it also implicitly covers indirect taxation. On the other hand, it does not include price or quantity data, and does not include time series data.

Table 8.1 shows the arrays in the sets file.

Table 8.1 Arrays in the GTAP sets file

| Name | Dimension | Description                    |
|------|-----------|--------------------------------|
| H1   | $r$       | Regions                        |
| H2   | $t$       | Traded commodities             |
| H3   | $s+m+t+1$ | Non-saving commodities         |
| H4   | $s+m+t$   | Demanded commodities           |
| H5   | $t+1$     | Produced commodities           |
| H6   | $s+m$     | Endowment commodities          |
| H7   | $s$       | Sluggish endowment commodities |
| H8   | $m$       | Mobile endowment commodities   |
| H9   | 1         | Capital endowment commodity    |

|     |                                                                  |
|-----|------------------------------------------------------------------|
| $m$ | number of primary factors perfectly mobile across industries     |
| $r$ | number of regions                                                |
| $s$ | number of primary factors not perfectly mobile across industries |
| $t$ | number of tradeable commodities (sectors)                        |

The array H1 is a list of regions in the model. H2 lists ordinary goods and services or *traded commodities*, so called because they can be traded between regions. In this they contrast with the primary factors or *endowment commodities*, listed in array H6. The endowment commodities include land, unskilled labor, skilled labor, capital, and natural resources. One of these, capital, is specified in array H9 as the *capital endowment commodity* (this is for convenience in implementing the investment theory of the model).

The arrays H7 and H8 divide the endowment commodities into two groups. The *mobile* endowment commodities (H8) are perfectly mobile across industries within each region; the *sluggish* endowment commodities (H7) are imperfectly mobile or immobile. In the standard data base, labor and capital are classed as mobile, and land and natural resources as sluggish. This is suitable for long-run simulations. For short-run simulations, users may wish to move capital from H8 to H7, to treat it as sluggish rather than mobile.

The remaining arrays are provided for convenience in implementing the theoretical structure of the GTAP model. The *non-savings commodities*, array H3, comprise the endowment commodities, the traded commodities, and an investment good. The *demanded commodities*, H4, comprise endowment and traded commodities; the *produced commodities*, H5, comprise traded commodities and the investment good. Finally, array H9 specifies as the *capital endowment commodity* one of the endowment commodities listed in H6 (the task of identifying this commodity is left to the reader).

In the standard data base, there are forty-five regions and fifty traded commodities. These are defined in the GTAP regional and sectoral classifications.

Table 8.2 shows the regional definitions used in version 4 of the data base.

Table 8.2 Regions in the GTAP data base

| Number | Code | Name                              | Member Regions                                                                                                                   |
|--------|------|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| 1      | AUS  | Australia                         | Australia<br>Heard & McDonald Islands<br>Norfolk Island                                                                          |
| 2      | NZL  | New Zealand                       | New Zealand                                                                                                                      |
| 3      | JPN  | Japan                             | Japan                                                                                                                            |
| 4      | KOR  | Korea                             | Korea                                                                                                                            |
| 5      | IDN  | Indonesia                         | East Timor<br>Indonesia                                                                                                          |
| 6      | MYS  | Malaysia                          | Malaysia                                                                                                                         |
| 7      | PHL  | Philippines                       | Philippines                                                                                                                      |
| 8      | SGP  | Singapore                         | Singapore                                                                                                                        |
| 9      | THA  | Thailand                          | Thailand                                                                                                                         |
| 10     | VNM  | Viet Nam                          | Viet Nam                                                                                                                         |
| 11     | CHN  | China                             | China                                                                                                                            |
| 12     | HKG  | Hong Kong                         | Hong Kong                                                                                                                        |
| 13     | TWN  | Taiwan                            | Taiwan                                                                                                                           |
| 14     | IND  | India                             | India                                                                                                                            |
| 15     | LKA  | Sri Lanka                         | Sri Lanka                                                                                                                        |
| 16     | RAS  | Rest of South Asia                | Bangladesh<br>Bhutan<br>Maldives<br>Nepal<br>Pakistan                                                                            |
| 17     | CAN  | Canada                            | Canada                                                                                                                           |
| 18     | USA  | United States of America          | American Samoa<br>Guam<br>Northern Mariana Islands<br>Puerto Rico<br>United States Virgin Islands<br>United States of America    |
| 19     | MEX  | Mexico                            | Mexico                                                                                                                           |
| 20     | CAM  | Central America and the Caribbean | Anguila<br>Antigua & Barbuda<br>Aruba<br>Bahamas<br>Barbados<br>Belize<br>British Virgin Islands<br>Cayman Islands<br>Costa Rica |

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Table 8.2 Regions in the GTAP data base (continued)

| Number | Code | Name                   | Member Regions                   |
|--------|------|------------------------|----------------------------------|
|        |      |                        | Cuba                             |
|        |      |                        | Dominica                         |
|        |      |                        | Dominican Republic               |
|        |      |                        | El Salvador                      |
|        |      |                        | Grenada                          |
|        |      |                        | Guatemala                        |
|        |      |                        | Haiti                            |
|        |      |                        | Honduras                         |
|        |      |                        | Jamaica                          |
|        |      |                        | Montserrat                       |
|        |      |                        | Netherlands Antilles             |
|        |      |                        | Nicaragua                        |
|        |      |                        | Panama                           |
|        |      |                        | Saint Christopher and Nevis      |
|        |      |                        | Saint Lucia                      |
|        |      |                        | Saint Vincent and the Grenadines |
|        |      |                        | Trinidad and Tobago              |
|        |      |                        | Turks and Caicos Isl.            |
| 21     | VEN  | Venezuela              | Venezuela                        |
| 22     | COL  | Colombia               | Colombia                         |
| 23     | RAP  | Rest of Andean Pact    | Bolivia                          |
|        |      |                        | Ecuador                          |
|        |      |                        | Peru                             |
| 24     | ARG  | Argentina              | Argentina                        |
| 25     | BRA  | Brazil                 | Brazil                           |
| 26     | CHL  | Chile                  | Chile                            |
| 27     | URY  | Uruguay                | Uruguay                          |
| 28     | RSM  | Rest of South America  | Guyana                           |
|        |      |                        | Paraguay                         |
|        |      |                        | Surinam                          |
| 29     | GBR  | United Kingdom         | Channel Islands                  |
|        |      |                        | Isle of Man                      |
|        |      |                        | United Kingdom                   |
| 30     | DEU  | Germany                | Germany                          |
| 31     | DNK  | Denmark                | Denmark                          |
| 32     | SWE  | Sweden                 | Sweden                           |
| 33     | FIN  | Finland                | Finland                          |
| 34     | REU  | Rest of European Union | Austria                          |
|        |      |                        | Belgium                          |

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Table 8.2 Regions in the GTAP data base (continued)

| Number | Code | Name                        | Member Regions            |
|--------|------|-----------------------------|---------------------------|
| 35     | EFT  | EFTA                        | France                    |
|        |      |                             | French Guiana             |
|        |      |                             | Gibraltar                 |
|        |      |                             | Greece                    |
|        |      |                             | Guadeloupe                |
|        |      |                             | Holy See                  |
|        |      |                             | Ireland                   |
|        |      |                             | Italy                     |
|        |      |                             | Luxembourg                |
|        |      |                             | Martinique                |
|        |      |                             | Monaco                    |
|        |      |                             | Netherlands               |
|        |      |                             | Portugal                  |
|        |      |                             | Reunion                   |
|        |      |                             | Saint Pierre and Miquelon |
|        |      |                             | San Marino                |
|        |      |                             | Spain                     |
|        |      |                             | Iceland                   |
|        |      |                             | Leichtenstein             |
|        |      |                             | Norway                    |
| 36     | CEA  | Central European Associates | Svalbard and Jan Mayen Is |
|        |      |                             | Switzerland               |
|        |      |                             | Bulgaria                  |
|        |      |                             | Czech Republic            |
|        |      |                             | Hungary                   |
|        |      |                             | Poland                    |
|        |      |                             | Romania                   |
| 37     | FSU  | Former Soviet Union         | Slovakia                  |
|        |      |                             | Slovenia                  |
|        |      |                             | Armenia                   |
|        |      |                             | Azerbaijan                |
|        |      |                             | Belarus                   |
|        |      |                             | Estonia                   |
|        |      |                             | Georgia                   |
|        |      |                             | Kazakhstan                |
|        |      |                             | Kyrgyzstan                |
|        |      |                             | Latvia                    |
|        |      |                             | Lithuania                 |
|        |      |                             | Moldova                   |

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Table 8.2 Regions in the GTAP data base (continued)

| Number | Code | Name                        | Member Regions       |
|--------|------|-----------------------------|----------------------|
|        |      |                             | Russian Federation   |
|        |      |                             | Tajikistan           |
|        |      |                             | Turkmenistan         |
|        |      |                             | Ukraine              |
|        |      |                             | Uzbekistan           |
| 38     | TUR  | Turkey                      | Turkey               |
| 39     | RME  | Rest of Middle East         | Bahrain              |
|        |      |                             | Iran                 |
|        |      |                             | Iraq                 |
|        |      |                             | Israel               |
|        |      |                             | Jordan               |
|        |      |                             | Kuwait               |
|        |      |                             | Lebanon              |
|        |      |                             | Oman                 |
|        |      |                             | Qatar                |
|        |      |                             | Saudi Arabia         |
|        |      |                             | Syria                |
|        |      |                             | United Arab Emirates |
|        |      |                             | Yemen                |
|        |      |                             | Yemen Democratic     |
| 40     | MAR  | Morocco                     | Morocco              |
|        |      |                             | Western Sahara       |
| 41     | RNF  | Rest of North Africa        | Algeria              |
|        |      |                             | Egypt                |
|        |      |                             | Libya                |
|        |      |                             | Tunisia              |
| 42     | SAF  | South African Customs Union | Botswana             |
|        |      |                             | Lesotho              |
|        |      |                             | Namibia              |
|        |      |                             | South Africa         |
|        |      |                             | Swaziland            |
| 43     | RSA  | Rest of southern Africa     | Angola               |
|        |      |                             | Malawi               |
|        |      |                             | Mauritius            |
|        |      |                             | Mozambique           |
|        |      |                             | Tanzania             |
|        |      |                             | Zambia               |
|        |      |                             | Zimbabwe             |
| 44     | RSS  | Rest of sub-Saharan Africa  | Benin                |

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Table 8.2 Regions in the GTAP data base (continued)

| Number | Code | Name          | Member Regions           |
|--------|------|---------------|--------------------------|
|        |      |               | Burkina Faso             |
|        |      |               | Burundi                  |
|        |      |               | Cameroon                 |
|        |      |               | Cape Verde               |
|        |      |               | Central African Republic |
|        |      |               | Chad                     |
|        |      |               | Comoros                  |
|        |      |               | Congo                    |
|        |      |               | Cote d'Ivoire            |
|        |      |               | Djibouti                 |
|        |      |               | Equatorial Guinea        |
|        |      |               | Eritrea                  |
|        |      |               | Ethiopia                 |
|        |      |               | Gabon                    |
|        |      |               | Gambia                   |
|        |      |               | Ghana                    |
|        |      |               | Guinea                   |
|        |      |               | Guinea-Bissau            |
|        |      |               | Kenya                    |
|        |      |               | Liberia                  |
|        |      |               | Madagascar               |
|        |      |               | Mali                     |
|        |      |               | Mauritania               |
|        |      |               | Mayotte                  |
|        |      |               | Niger                    |
|        |      |               | Nigeria                  |
|        |      |               | Rwanda                   |
|        |      |               | Sao Tome and Principe    |
|        |      |               | Senegal                  |
|        |      |               | Seychelles               |
|        |      |               | Sierra Leone             |
|        |      |               | Somalia                  |
|        |      |               | Sudan                    |
|        |      |               | Togo                     |
|        |      |               | Uganda                   |
|        |      |               | Zaire                    |
| 45     | ROW  | Rest of World | Afghanistan              |
|        |      |               | Albania                  |
|        |      |               | Andorra                  |

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Table 8.2 Regions in the GTAP data base (continued)

| Number | Code | Name | Member Regions                         |
|--------|------|------|----------------------------------------|
|        |      |      | Bermuda                                |
|        |      |      | Bosnia and Herzegovina                 |
|        |      |      | British Indian Ocean Territories       |
|        |      |      | Brunei                                 |
|        |      |      | Cambodia                               |
|        |      |      | Christmas Island                       |
|        |      |      | Cocos (Keeling) Islands                |
|        |      |      | Cook Islands                           |
|        |      |      | Croatia                                |
|        |      |      | Cyprus                                 |
|        |      |      | Falkland Islands                       |
|        |      |      | Faroe Islands                          |
|        |      |      | Fiji                                   |
|        |      |      | French Polynesia                       |
|        |      |      | Greenland                              |
|        |      |      | Johnston Island                        |
|        |      |      | Kiribati                               |
|        |      |      | Laos                                   |
|        |      |      | Macao                                  |
|        |      |      | Macedonia, former Yugoslav Republic of |
|        |      |      | Malta                                  |
|        |      |      | Marshall Islands                       |
|        |      |      | Micronesia, Federated States of        |
|        |      |      | Mongolia                               |
|        |      |      | Myanmar                                |
|        |      |      | Nauru                                  |
|        |      |      | New Caledonia                          |
|        |      |      | Niue                                   |
|        |      |      | North Korea                            |
|        |      |      | Pacific Islands                        |
|        |      |      | Palau                                  |
|        |      |      | Papua New Guinea                       |
|        |      |      | Pitcairn Islands                       |
|        |      |      | Saint Helena                           |
|        |      |      | Solomon Islands                        |
|        |      |      | Tokelau                                |
|        |      |      | Tonga                                  |
|        |      |      | Tuvalu                                 |

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Table 8.2 Regions in the GTAP data base (continued)

| Number | Code | Name | Member Regions         |
|--------|------|------|------------------------|
|        |      |      | Vanuatu                |
|        |      |      | Wake Island            |
|        |      |      | Wallis and Futura Isl. |
|        |      |      | Western Samoa          |
|        |      |      | Yugoslavia             |

Tables 8.3 and 8.4 show the sectoral definitions used in version 3 of the data base. We define the GTAP agricultural and food processing sectors by reference to the Central Product Classification (*CPC*), as shown in table 8.3. We define the other GTAP sectors by reference to the International Standard Industry Classification (*ISIC*), as shown in table 8.4. 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, the 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 (UN 1990, 1991).

Table 8.3 Sectors in the GTAP data base

| GTAP sector |      | ISIC class                   |                                                                                                                                                                                    |
|-------------|------|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Number      | Code | Code                         | Description                                                                                                                                                                        |
| 1           | pdr  | 1110 (p)<br>1120 (p)         | Agricultural & livestock production (paddy rice only)<br>Agricultural services (servicing paddy rice production only)                                                              |
| 2           | wht  | 1110 (p)<br>1120 (p)         | Agricultural & livestock production (wheat only)<br>Agricultural services (servicing wheat production only)                                                                        |
| 3           | gro  | 1110 (p)<br>1120 (p)         | Agricultural & livestock production (grains except wheat & rice only)<br>Agricultural services (servicing production of grains, except wheat & rice only)                          |
| 4           | ngc  | 1110 (p)<br>1120 (p)         | Agricultural & livestock production (non-grain crops only)<br>Agricultural services (servicing non-grain crops production only)                                                    |
| 5           | wol  | 1110 (p)<br>1120 (p)         | Agricultural & livestock production (wool only)<br>Agricultural services (servicing wool production only)                                                                          |
| 6           | olp  | 1110 (p)<br>1120 (p)<br>1130 | Agricultural & livestock production (other livestock production only)<br>Agricultural services (servicing other livestock production only)<br>Hunting, trapping & game propagation |
| 7           | for  | 1210                         | Forestry                                                                                                                                                                           |

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Table 8.3 Sectors in the GTAP data base (continued)

| GTAP sector |      | ISIC class |                                                                                  |
|-------------|------|------------|----------------------------------------------------------------------------------|
| Number      | Code | Code       | Description                                                                      |
|             |      | 1220       | Logging                                                                          |
| 8           | fsh  | 1301       | Ocean and coastal fishing                                                        |
|             |      | 1302       | Fishing n.e.c.                                                                   |
| 9           | col  | 2100       | Coal mining                                                                      |
|             |      | 3540 (p)   | Manufacture of miscellaneous products of petroleum and coal (briquettes only) ** |
| 10          | oil  | 2200 (p)   | Crude petroleum & natural gas production (oil only)                              |
| 11          | gas  | 2200 (p)   | Crude petroleum & natural gas production (gas only)                              |
|             |      | 3530 (p)   | Petroleum refineries (LPG only) **                                               |
| 12          | omn  | 2301       | Iron ore mining                                                                  |
|             |      | 2302       | Non-ferrous ore mining                                                           |
|             |      | 2901       | Stone quarrying, clay and pits                                                   |
|             |      | 2902       | Chemical and fertiliser mineral mining                                           |
|             |      | 2903       | Salt mining                                                                      |
|             |      | 2909       | Mining and quarrying n.e.c.                                                      |
| 13          | pcr  | 3116 (p)   | Grain mill products (processed rice only)                                        |
| 14          | met  | 3111       | Slaughtering, preparing and preserving meat                                      |
| 15          | mil  | 3112       | Manufacture of dairy products                                                    |
| 16          | ofp  | 3113       | Canning and preserving of fruits and vegetables                                  |
|             |      | 3114       | Canning, preserving & processing of fish, crustaceans and similar foods          |
|             |      | 3115       | Manufacture of vegetable and animal oils & fats                                  |
|             |      | 3116 (p)   | Grain mill products (except processed rice)                                      |
|             |      | 3117       | Manufacture of bakery products                                                   |
|             |      | 3118       | Sugar factories and refineries                                                   |
|             |      | 3119       | Manufacture of cocoa, chocolate & sugar confectionery                            |
|             |      | 3121       | Manufacture of food products n.e.c.                                              |
|             |      | 3122       | Manufacture of prepared animal feeds                                             |
| 17          | b_t  | 3131       | Distilling, rectifying & blending spirits                                        |
|             |      | 3132       | Wine industries                                                                  |
|             |      | 3133       | Malt liquors and malt                                                            |
|             |      | 3134       | Soft drinks & carbonated waters industries                                       |

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Table 8.3 Sectors in the GTAP data base (continued)

| GTAP sector |      | ISIC class |                                                                                               |
|-------------|------|------------|-----------------------------------------------------------------------------------------------|
| Number      | Code | Code       | Description                                                                                   |
|             |      | 3140       | Tobacco manufactures                                                                          |
| 18          | tex  | 3211       | Spinning, weaving & finishing textiles                                                        |
|             |      | 3212       | Manufacture of made-up textile goods excluding wearing apparel                                |
|             |      | 3213       | Knitting mills                                                                                |
|             |      | 3214       | Manufacture of carpets & rugs                                                                 |
|             |      | 3215       | Cordage, rope & twine industries                                                              |
|             |      | 3219       | Manufacture of textiles n.e.c.                                                                |
| 19          | wap  | 3220       | Manufacture of wearing apparel, except footwear                                               |
| 20          | lea  | 3231       | Tanneries & leather finishing                                                                 |
|             |      | 3232       | Fur dressing & dyeing industries                                                              |
|             |      | 3233       | Manufacture of products of leather & leather substitutes, except footwear and wearing apparel |
|             |      | 3240       | Manufacture of footwear, except vulcanised or moulded rubber or plastic footwear              |
| 21          | lum  | 3311       | Sawmills, planing & other wood mills                                                          |
|             |      | 3312       | Manufacture of wooden & cane containers & small cane ware                                     |
|             |      | 3319       | Manufacture of wood & cork products n.e.c.                                                    |
|             |      | 3320       | Manufacture of furniture & fixtures, except primarily of metal                                |
| 22          | ppp  | 3411       | Manufacture of pulp, paper & paperboard                                                       |
|             |      | 3412       | Manufacture of containers & boxes of paper and paperboard                                     |
|             |      | 3419       | Manufacture of pulp, paper & paperboard articles n.e.c.                                       |
|             |      | 3420       | Printing, publishing & allied industries                                                      |
| 23          | p_c  | 3530 (p)   | Petroleum refineries (except LPG) **                                                          |
|             |      | 3540 (p)   | Manufacture of miscellaneous products of petroleum and coal (except briquettes) **            |
| 24          | crp  | 3511       | Manufacture of basic industrial chemicals except fertilisers                                  |
|             |      | 3512       | Manufacture of fertilisers and pesticides                                                     |
|             |      | 3513       | Manufacture of synthetic resins, plastic materials and man-made fibres except glass           |
|             |      | 3521       | Manufacture of paints, varnishes and lacquers                                                 |
|             |      | 3522       | Manufacture of drugs and medicines                                                            |
|             |      | 3523       | Manufacture of soap and cleaning preparations, perfumes and cosmetics                         |

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Table 8.3 Sectors in the GTAP data base (continued)

| GTAP sector |      | ISIC class |                                                                                                   |
|-------------|------|------------|---------------------------------------------------------------------------------------------------|
| Number      | Code | Code       | Description                                                                                       |
|             |      | 3529       | Manufacture of chemical products n.e.c.                                                           |
|             |      | 3551       | Tyre and tube industries                                                                          |
|             |      | 3559       | Manufacture of rubber products n.e.c.                                                             |
|             |      | 3560       | Manufacture of plastic products n.e.c.                                                            |
| 25          | nmm  | 3610       | Manufacture of pottery, china and earthenware                                                     |
|             |      | 3620       | Manufacture of glass and glass products                                                           |
|             |      | 3691       | Manufacture of structural clay compounds                                                          |
|             |      | 3692       | Manufacture of cement, lime and plaster                                                           |
|             |      | 3699       | Manufacture of non-metallic mineral products n.e.c.                                               |
| 26          | i_s  | 3710       | Iron and steel basic industries                                                                   |
| 27          | nfm  | 3720       | Non-ferrous metal basic industries                                                                |
| 28          | fmp  | 3811       | Manufacture of cutlery, hand tools and general hardware                                           |
|             |      | 3812       | Manufacture of furniture and fixtures primarily of metal                                          |
|             |      | 3813       | Manufacture of structural metal products                                                          |
|             |      | 3819       | Manufacture of fabricated metal products except machinery & equipment n.e.c.                      |
| 29          | trn  | 3841       | Ship building and repairing                                                                       |
|             |      | 3842       | Manufacture of railroad equipment                                                                 |
|             |      | 3843       | Manufacture of motor vehicles                                                                     |
|             |      | 3844       | Manufacture of motorcycles and bicycles                                                           |
|             |      | 3845       | Manufacture of aircraft                                                                           |
|             |      | 3849       | Manufacture of transport equipment n.e.c.                                                         |
| 30          | ome  | 3821       | Manufacture of engines and turbines                                                               |
|             |      | 3822       | Manufacture of agricultural machinery and equipment                                               |
|             |      | 3823       | Manufacture of metal and wood working machinery                                                   |
|             |      | 3824       | Manufacture of special industrial machinery and equipment except metal and wood working machinery |
|             |      | 3825       | Manufacture of office, computing and accounting machinery                                         |
|             |      | 3829       | Machinery and equipment except electrical n.e.c.                                                  |
|             |      | 3831       | Manufacture of electrical industrial machinery and apparatus                                      |
|             |      | 3832       | Manufacture of radio, television and communication equipment and apparatus                        |
|             |      | 3833       | Manufacture of electrical appliances and housewares                                               |

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Table 8.3 Sectors in the GTAP data base (continued)

| GTAP sector |      | ISIC class |                                                                                             |
|-------------|------|------------|---------------------------------------------------------------------------------------------|
| Number      | Code | Code       | Description                                                                                 |
| 31          | omf  | 3839       | Manufacture of electrical apparatus and supplies n.e.c.                                     |
|             |      | 3851       | Manufacture of professional and scientific, and measuring and controlling equipment, n.e.c. |
|             |      | 3852       | Manufacture of photographic and optical goods                                               |
|             |      | 3853       | Manufacture of watches and clocks                                                           |
|             |      | 3901       | Manufacture of jewellery and related articles                                               |
|             |      | 3902       | Manufacture of musical instruments                                                          |
|             |      | 3903       | Manufacture of sporting and athletic goods                                                  |
|             |      | 3909       | Manufacturing industries n.e.c.                                                             |
|             |      | 4101       | Electric light and power                                                                    |
|             |      | 4102       | Gas manufacture and distribution                                                            |
| 32          | egw  | 4103       | Steam and hot water supply                                                                  |
|             |      | 4200       | Water works and supply                                                                      |
|             |      | 5000       | Construction                                                                                |
|             |      | 6100       | Wholesale trade                                                                             |
| 34          | t_t  | 6200       | Retail trade                                                                                |
|             |      | 6310       | Restaurants, cafes, and other eating and drinking places                                    |
|             |      | 6320       | Hotels, rooming houses, camps and other lodging places                                      |
|             |      | 7111       | Railway transport                                                                           |
|             |      | 7112       | Urban, suburban and inter-urban highway passenger transport                                 |
|             |      | 7113       | Other passenger land transport                                                              |
|             |      | 7114       | Freight transport by road                                                                   |
|             |      | 7115       | Pipeline transport                                                                          |
|             |      | 7116       | Supporting services to land transport                                                       |
|             |      | 7121       | Ocean and coastal transport                                                                 |
|             |      | 7122       | Inland water transport                                                                      |
|             |      | 7123       | Supporting services to water transport                                                      |
|             |      | 7131       | Air transport carriers                                                                      |
|             |      | 7132       | Supporting services to air transport                                                        |
|             |      | 7191       | Services incidental to transport                                                            |
|             |      | 7192       | Storage and warehousing                                                                     |
|             |      | 7200       | Communication                                                                               |

contd

Table 8.3 Sectors in the GTAP data base (continued)

| GTAP sector |      | ISIC class |                                                                                           |
|-------------|------|------------|-------------------------------------------------------------------------------------------|
| Number      | Code | Code       | Description                                                                               |
| 35          | osp  | 0          | Activities not adequately defined                                                         |
|             |      | 8101       | Monetary institutions                                                                     |
|             |      | 8102       | Other financial institutions                                                              |
|             |      | 8103       | Financial services                                                                        |
|             |      | 8200       | Insurance                                                                                 |
|             |      | 8310       | Real estate                                                                               |
|             |      | 8321       | Legal services                                                                            |
|             |      | 8322       | Accounting, auditing and bookkeeping services                                             |
|             |      | 8323       | Data processing and tabulating services                                                   |
|             |      | 8324       | Engineering, architectural and technical services                                         |
|             |      | 8325       | Advertising services                                                                      |
|             |      | 8329       | Business services, except machinery and equipment rental and leasing, n.e.c.              |
|             |      | 8330       | Machinery and equipment rental and leasing                                                |
|             |      | 9411       | Motion picture production                                                                 |
|             |      | 9412       | Motion picture distribution and projection                                                |
|             |      | 9413       | Radio and television broadcasting                                                         |
|             |      | 9414       | Theatrical producers and entertainment services                                           |
|             |      | 9415       | Authors, music composers and other independent artists n.e.c.                             |
|             |      | 9420       | Libraries, museums, botanical and zoological gardens, and other cultural services, n.e.c. |
|             |      | 9490       | Amusement and recreational services n.e.c.                                                |
|             |      | 9511       | Repair of footwear and other leather goods                                                |
|             |      | 9512       | Electrical repair shops                                                                   |
|             |      | 9513       | Repair of motor vehicles and motorcycles                                                  |
|             |      | 9514       | Watch, clock and jewelry repair                                                           |
|             |      | 9519       | Other repair shops n.e.c.                                                                 |
|             |      | 9520       | Laundries, laundry services, and cleaning and dyeing plants                               |
|             |      | 9530       | Domestic services                                                                         |
|             |      | 9591       | Barber and beauty shops                                                                   |
|             |      | 9592       | Photographic studios, including commercial photography                                    |
|             |      | 9599       | Personal services n.e.c.                                                                  |
| 36          | osg  | 9100       | Public administration and defence                                                         |
|             |      | 9200       | Sanitary and similar services                                                             |
|             |      | 9310       | Education services                                                                        |

contd

Table 8.3 Sectors in the GTAP data base (continued)

| GTAP sector |      | ISIC class |                                                  |
|-------------|------|------------|--------------------------------------------------|
| Number      | Code | Code       | Description                                      |
|             |      | 9331       | Medical, dental and other health services        |
|             |      | 9332       | Veterinary services                              |
|             |      | 9340       | Welfare institutions                             |
|             |      | 9350       | Business, professional and labor associations    |
|             |      | 9391       | Religious organizations                          |
|             |      | 9399       | Social and related community services n.e.c.     |
|             |      | 9600       | International and other extra-territorial bodies |
| 37          | dwe  | n . a .    | n.a.                                             |

The parameters file contains invariant behavioral parameters, arranged in eight arrays, as listed in table 8.5.

Table 8.4 GSC1 sectors defined by reference to the ISIC, Rev. 3

| GSC1   |      | ISIC3 |                                                                                                |
|--------|------|-------|------------------------------------------------------------------------------------------------|
| Number | Code | Code  | Description                                                                                    |
| 13     | for  | 02    | Forestry, logging and related service activities                                               |
| 14     | fsh  | 015   | Hunting, trapping and game propagation including related service activities                    |
|        |      | 05    | Fishing, operation of fish hatcheries and fish farms; service activities incidental to fishing |
| 15     | col  | 101   | Mining and agglomeration of hard coal                                                          |
|        |      | 102   | Mining and agglomeration of lignite                                                            |
| 16     | oil  | 111   | Extraction of crude petroleum and natural gas (part)                                           |
|        |      | 112   | Service activities incidental to oil and gas extraction excluding surveying (part)             |
| 17     | gas  | 111   | Extraction of crude petroleum and natural gas (part)                                           |
|        |      | 112   | Service activities incidental to oil and gas extraction excluding surveying (part)             |
| 18     | omn  | 103   | Mining and agglomeration of peat                                                               |
|        |      | 12    | Mining of uranium and thorium ores                                                             |
|        |      | 13    | Mining of metal ores                                                                           |
|        |      | 14    | Other mining and quarrying                                                                     |
| 27     | tex  | 17    | Manufacture of textiles                                                                        |
|        |      | 243   | Manufacture of man-made fibers                                                                 |
| 28     | wap  | 18    | Manufacture of wearing apparel; dressing and dyeing of fur                                     |

contd

Table 8.4 GSC1 sectors defined by reference to the ISIC, Rev. 3

| GSC1   |      | ISIC3 |                                                                                                                                 |
|--------|------|-------|---------------------------------------------------------------------------------------------------------------------------------|
| Number | Code | Code  | Description                                                                                                                     |
| 29     | lea  | 19    | Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness and footwear                               |
| 30     | lum  | 20    | Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials |
|        |      | 361   | Manufacture of furniture                                                                                                        |
| 31     | ppp  | 21    | Manufacture of paper and paper products                                                                                         |
|        |      | 2211  | Publishing of books, brochures, musical books and other publications                                                            |
|        |      | 2212  | Publishing of newspapers, journals and periodicals                                                                              |
|        |      | 2219  | Other publishing (photos, engravings, postcards, timetables, forms, posters, art reproductions, etc.)                           |
|        |      | 222   | Printing and service activities related to printing                                                                             |
| 32     | p_c  | 231   | Manufacture of coke oven products                                                                                               |
|        |      | 232   | Manufacture of refined petroleum products                                                                                       |
| 33     | crp  | 233   | Processing of nuclear fuel                                                                                                      |
|        |      | 241   | Manufacture of basic chemicals                                                                                                  |
|        |      | 242   | Manufacture of other chemical products                                                                                          |
|        |      | 25    | Manufacture of rubber and plastics products                                                                                     |
| 34     | nmn  | 26    | Manufacture of other non-metallic mineral products                                                                              |
| 35     | i_s  | 271   | Manufacture of basic iron and steel                                                                                             |
|        |      | 2731  | Casting of iron and steel                                                                                                       |
| 36     | nfm  | 272   | Manufacture of basic precious and non-ferrous metals                                                                            |
|        |      | 2732  | Casting of non-ferrous metals                                                                                                   |
| 37     | fmp  | 28    | Manufacture of fabricated metal products, except machinery and equipment                                                        |
| 38     | mvh  | 34    | Manufacture of motor vehicles, trailers and semi-trailers                                                                       |
| 39     | otn  | 35    | Manufacture of other transport equipment                                                                                        |
| 40     | ele  | 30    | Manufacture of office, accounting and computing machinery                                                                       |
|        |      | 32    | Manufacture of radio, television and communication equipment and apparatus                                                      |
| 41     | ome  | 2213  | Publishing of recorded media                                                                                                    |
|        |      | 223   | Reproduction of recorded media                                                                                                  |
|        |      | 29    | Manufacture of machinery and equipment n.e.c.                                                                                   |
|        |      | 31    | Manufacture of electrical machinery and apparatus n.e.c.                                                                        |
|        |      | 33    | Manufacture of medical, precision and optical instruments, watches and clocks                                                   |
| 42     | omf  | 36    | Manufacturing n.e.c.                                                                                                            |
| 43     | ely  | 401   | Production, collection and distribution of electricity                                                                          |
| 44     | gdt  | 402   | Manufacture of gas; distribution of gaseous fuels through mains                                                                 |
|        |      | 403   | Steam and hot water supply                                                                                                      |

contd

Table 8.4 GSC1 sectors defined by reference to the ISIC, Rev. 3

| GSC1   |      | ISIC3 |                                                                                |
|--------|------|-------|--------------------------------------------------------------------------------|
| Number | Code | Code  | Description                                                                    |
|        |      |       | Wholesale trade and commission trade, except of motor vehicles and motorcycles |
| 45     | wtr  | 41    | Collection, purification and distribution of water                             |
| 46     | cns  | 45    | Construction                                                                   |
| 47     | t_t  | 37    | Recycling                                                                      |
|        |      | 521   | Non-specialized retail trade in stores                                         |
|        |      | 522   | Retail sale of food, beverages and tobacco in specialized stores               |
|        |      | 523   | Other retail trade of new goods in specialized stores                          |
|        |      | 524   | Retail sale of second-hand goods in stores                                     |
|        |      | 525   | Retail trade not in stores                                                     |
|        |      | 55    | Hotels and restaurants                                                         |
|        |      | 60    | Land transport; transport via pipelines                                        |
|        |      | 61    | Water transport                                                                |
|        |      | 62    | Air transport                                                                  |
|        |      | 63    | Supporting and auxiliary transport activities; activities of travel agencies   |
|        |      | 64    | Post and telecommunications                                                    |
|        |      | 711   | Renting of transport equipment                                                 |
| 48     | osp  | 526   | Repair of personal and household goods                                         |
|        |      | 65    | Financial intermediation, except insurance and pension funding                 |
|        |      | 66    | Insurance and pension funding, except compulsory social security               |
|        |      | 67    | Activities auxiliary to financial intermediation                               |
|        |      | 70    | Real estate activities                                                         |
|        |      | 712   | Renting of other machinery and equipment                                       |
|        |      | 713   | Renting of personal and household goods n.e.c.                                 |
|        |      | 72    | Computer and related activities                                                |
|        |      | 74    | Other business activities                                                      |
|        |      | 92    | Recreational, cultural and sporting activities                                 |
|        |      | 93    | Other service activities                                                       |
|        |      | 95    | Private households with employed persons                                       |
| 49     | osg  | 73    | Research and development                                                       |
|        |      | 75    | Public administration and defence; compulsory social security                  |
|        |      | 80    | Education                                                                      |
|        |      | 85    | Health and social work                                                         |
|        |      | 90    | Sewage and refuse disposal, sanitation and similar activities                  |
|        |      | 91    | Activities of membership organizations n.e.c.                                  |
|        |      | 99    | Extra-territorial organizations and bodies                                     |
| 50     | dwe  | n.a.  | n.a.                                                                           |

n.a. not available

n.e.c. not elsewhere classified

Table 8.5. Arrays in the GTAP parameters file

| Name     | Dimension                                                         | Description                                                                                            |
|----------|-------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| SUBPAR   | $t \times r$                                                      | substitution parameter in CDE consumer demand system                                                   |
| INCPAR   | $t \times r$                                                      | expansion parameter in CDE consumer demand system                                                      |
| ESUBD    | $t$                                                               | elasticity of substitution between domestic product and imports                                        |
| ESUBM    | $t$                                                               | elasticity of substitution between imports from different regions                                      |
| ESUBVA   | $t$                                                               | elasticity of substitution between primary factors                                                     |
| ETRAE    | $s$                                                               | elasticity of transformation between industries                                                        |
| RORFLEX  | $r$                                                               | elasticity of expected rate of return with respect to capital stock                                    |
| RORDELTA | 1                                                                 | dummy parameter used to chose between alternative treatments of international allocation of investment |
| $r$      | number of regions                                                 |                                                                                                        |
| $s$      | number of primary factors not perfectly mobile between industries |                                                                                                        |
| $t$      | number of tradeable commodities (sectors)                         |                                                                                                        |

For a more detailed description of the parameters, see chapter 19, “Behavioral parameters”.

The data file consists of dollar values of flows of goods and services, arranged in 27 arrays, listed in table 8.6.

Table 8.6. Arrays in the GTAP data file

| Name | Dimension             | Description                                               |
|------|-----------------------|-----------------------------------------------------------|
| ADRV | $t \times r$          | anti-dumping duty                                         |
| EVFA | $e \times p \times r$ | primary factor purchases, at agents' prices               |
| EVOA | $e \times r$          | primary factor sales, at agents' prices                   |
| MFRV | $t \times r \times r$ | export subsidy equivalent of MFA quota premium            |
| PURV | $t \times r \times r$ | export subsidy equivalent of price undertakings           |
| SAVE | $r$                   | net saving, by region                                     |
| TFRV | $t \times r \times r$ | ordinary import duty                                      |
| TVOM | $t \times r$          | sales of domestic product, at market prices               |
| VDEP | $r$                   | capital depreciation                                      |
| VDFA | $t \times p \times r$ | domestic purchases, by firms, at agents' prices           |
| VDFM | $t \times p \times r$ | domestic purchases, by firms, at market prices            |
| VDGA | $t \times r$          | domestic purchases, by government, at agents' prices      |
| VDGM | $t \times r$          | domestic purchases, by government, at market prices       |
| VDPA | $t \times r$          | domestic purchases, by households, at agents' prices      |
| VDPM | $t \times r$          | domestic purchases, by households, at market prices       |
| VFM  | $e \times p \times r$ | primary factor purchases, by households, at market prices |
| VIFA | $t \times p \times r$ | import purchases, by firms, at agents' prices             |
| VIFM | $t \times p \times r$ | import purchases, by firms, at market prices              |
| VIGA | $t \times r$          | import purchases, by government, at agents' prices        |
| VIGM | $t \times r$          | import purchases, by government, at market prices         |
| VIMS | $t \times r \times r$ | imports, at market prices                                 |
| VIPA | $t \times r$          | import purchases, by households, at agents' prices        |
| VIPM | $t \times r$          | import purchases, by households, at market prices         |
| VIWS | $t \times r \times r$ | imports, at world prices                                  |
| VKB  | $r$                   | capital stock                                             |
| VRRV | $t \times r \times r$ | export subsidy equivalent of voluntary export restraints  |
| VST  | $t \times r$          | margin exports                                            |
| VXMD | $t \times r \times r$ | non-margin exports, at world prices                       |
| VXWD | $t \times r \times r$ | non-margin exports, at market prices                      |
| XTRV | $t \times r \times r$ | ordinary export subsidy                                   |

$e$  number of endowment commodities (primary factors)

$p$  number of produced commodities

$r$  number of regions

$t$  number of tradeable commodities (sectors)

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