16.A

Construction of the Protection Data Base

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This section describes the construction of the protection dataset in the GTAP 6 Data Base. The protection dataset covers import-side, export-side, and domestic support instruments. The import-side instruments are ordinary import tariff rates and anti-dumping duties. The export-side instruments are ordinary export subsidy rates, export tax equivalent rates of the quotas under the Agreement on Textiles and Clothing (ATC), voluntary price undertakings, and voluntary export restraints (VERs). The domestic support data include the rates of total domestic support and the percentage shares of output subsidies, intermediate input subsidies, land-based payments, and capital-based payments to total domestic support.

Further processing of the protection data set is done in order to incorporate the protection data with the value flows data comprising the main GTAP Data Base. A discussion of the protection data explicitly and implicitly available in the header arrays of the main GTAP data file is provided in section 2.4 of chapter 2. The import-side and export-side instruments are targeted and used to adjust the trade data flows (chapter 15) in the data base in the FIT procedure (chapter 19). The trade distortions are then reflected as differences between the market price and world price valuations of the same trade flow. The protection data for energy products is adjusted in the energy module (chapter 17) and the revised data are targeted in the FIT procedure (chapter 19). The shares to total domestic support payments are used in the FIT procedure to calculate output and input subsidies from the data base. These are then targeted and used to adjust the relevant data flows related to values of outputs and inputs. The shares to total payments of land-based and capital-based payments are used in the final data assembly procedure (chapter 21) to include land-based and capital-based payments from the data base.

In the subsequent sections of this chapter (16.B - 16.F), the data contributors document their data sources and the procedures employed in preparing their datasets for contribution to the GTAP 6 Data Base. The rest of this section explains the procedures employed in constructing the protection dataset.

16.A.1 Domestic Support

Domestic support data for 2001 from the OECD PSE/CSE database are incorporated in the GTAP 6 Data Base. Similar to GTAP 5, we map the PSE components, excluding market price support, into

four separate domestic support categories, namely: output subsidies, intermediate input subsidies, land-based payments, and capital-based payments. As documented by Hsin Huang in chapter 16.B, this was done for 15 OECD regions and 7 non-OECD member economies, and 9 agricultural commodities[1] plus a miscellaneous commodity category. In addition, using data from the European Guarantee and Guidance Fund (EAGGF), Hans Grinsted Jensen of the FOI split the total PSE payments in the EU15 into payments for the individual member states (see chapter 16.C). A standard formula for assigning the PSE components into the four different support categories was adapted for all countries covered in the OECD tables. As shown in table 16.A.1, separate standard formulas were applied to crops and livestock.

Table 16.A.1 Standard Formula used in Domestic Support Categories

Domestic Support Category	PSE Components		Description of PSE Components
	Crops	Livestock	
Output Subsidies	B	B	Payments based on output
	H	H	Miscellaneous payments
Intermediate Input Subsidies	E1	E1	Payments based on input use: variable inputs
	E2	E2	Payments based on input use: on-farm services
Land Based Payments	C		Payments based on area planted/animal numbers
	D	D	Payments based on historical entitlements
	F1	F1	
	F2		Payments based on input constraints: variable inputs
	F3	F3	Payments based on input constraints: fixed inputs
	G	G	Payments based on input constraints: set of inputs
			Payments based on overall farming income
Capital Based Payments		C	Payments based on area planted/animal numbers
	E3	E3	Payments based on input use: fixed inputs
		F2	Payments based on input constraints: fixed inputs

There are a couple of changes in the coverage of the domestic support data for the GTAP 6 Data Base. The country coverage of the data has been expanded to include some non-OECD member countries. Hsin Huang (OECD) supplied data not only for the OECD countries but also for non-member economies (NMEs) such as Bulgaria, Romania, Slovenia, Estonia, Latvia, Lithuania, and Russia.

The second modification is in the treatment of data for the following GTAP sectors: fruits and vegetables (v_f), plant-based fibers (pfb), and other crops (ocr). Since these GTAP commodities are not separately identified in the OECD PSE/CSE database but are all grouped under "Miscellaneous Commodities", we did not have domestic support data for these sectors in the GTAP 5 Data Base. For GTAP 6, Hans supplied disaggregated data for these commodities for the European Union countries.

[1] The agricultural commodities are: wheat, paddy rice, cereal grains, oilseeds, cane and beets, raw milk, cattle & sheep, other meat, and wool.

To have a treatment parallel for non-EU countries, we assigned the average domestic support reported for "Miscellaneous Commodities" in the OECD PSE data uniformly to these GTAP commodities for the non-EU countries covered in the domestic support dataset.

The data on powers of total domestic support and shares of each domestic support category to total payments, by commodity, for all 37 countries (OECD, NMEs and 15 EU member states) were assembled. For the OECD countries and NMEs, data for miscellaneous commodities were assigned to fruits and vegetables, plant-based fibers and other crops. The data on powers and shares of domestic support were extended to cover all 57 GTAP commodities with data flags indicating missing data. The regional coverage was also extended first to a subset of the standard countries and then to the set of standard countries. The data were then aggregated to the 87 GTAP 6 regions using GDP weights. A data file with powers of total domestic support and shares of each of the four domestic support categories to total payments, by commodity, was then generated for each single GTAP region.

The dataset on total domestic support was then combined with output subsidy data extracted from the input-output tables. Data from the I-O tables, if available, were used to fill in missing data from the PSE domestic support dataset. Data extracted from the I-O tables were classified as output subsidies and shares of output subsidies to total payments were set to 100 percent.

The domestic support dataset was further processed and used to calculate subsidies to output and intermediate inputs in the FIT procedure (documented in chapter 19) and land-based and capital-based payments in the global data assembly procedure (documented in chapter 21).

16.A.2 Import Tariffs

In is in the area of tariff data where there have been significant changes in the GTAP 6 Data Base in terms of sourcing, coverage, nature and quality, and data processing. The tariff data is a central feature of the GTAP 6 Data Base in light of quantitative analyses of the Doha Development Agenda and the burgeoning number preferential trading arrangements in the past few years.

In the GTAP 5 Data Base, agricultural tariffs and merchandise tariffs were obtained from the two separate sources. Agricultural tariff data were obtained from the Agricultural Trade Policy Database which is based on the Agricultural Market Access Database (AMAD). The non-bilateralized data on agricultural tariffs for 46 countries were MFN applied rates for 1998, where available, or bound rates for countries where applied rates were not reported. Data on merchandise tariffs were obtained from the World Bank and UNCTAD through an early version of the World Integrated Trade Software (WITS). Bilateral, MFN applied, trade-weighted tariff data for 1997 or for the closest available year were obtained for 118 importers and 238 partner exporters.

The 2001 tariff data in the GTAP 6 Data Base is from the Market Access Maps (MAcMap) contributed by the *Centre d'Etudes Prospectives et d'Information Internationales* (CEPII). The MAcMap data base is compiled from UNCTAD TRAINS data, country notifications to the WTO, AMAD, and from national customs information. Documentation about the MAcMap database, its sources and methodology, are available in chapter 16.D. In the GTAP 6 Data Base, we use trade-

weighted preferential rates data on ad valorem tariffs (including tariff rate quotas) plus the ad valorem equivalents (AVEs) of specific tariffs. The MAcMap tariff data for agriculture and merchandise commodities are provided to GTAP at the GTAP sectoral classification for 163 importer countries and 208 partner exporters. The data is then aggregated to the GTAP regional classification using GTAP's reconciled bilateral trade data as weights.

In the case of missing data, we apply our usual approach of using the protection rates derived from the input-output tables. However, we have excluded services commodities from this practice.

16.A.3 Export Subsidies

Agricultural export subsidy data for 2001, calculated from country notifications to the WTO, was contributed by Aziz Elbehri of ERS/USDA. Agricultural export subsidies are identified for the United States, Norway, Hungary, Poland, Israel, Slovakia, and the European Union. Data is still for 2000 for Korea, Canada, Switzerland, Czech Republic, and Turkey. We continue to use a common agricultural export subsidy rate for the EU member countries.

Since the set of countries in the dataset includes the European Union as a single region, the set of importing countries was mapped and extended to a subset of the standard countries. Using data flags to indicate missing data, the dataset was then extended to the full set of GTAP sectors and standard countries and then aggregated to the 87 GTAP regions using trade weights. An agricultural export subsidy data file, with data flags, was then generated for each single GTAP 6 region.

Export subsidy/tax data were also extracted from the input-output tables for countries not covered in the dataset . In using the data from the I-O tables, it is implicitly assumed that the export subsidy/tax information from the I-O tables cover only the ordinary export subsidies, i.e. excludes information on price undertakings, VERs, and MFA export tax equivalents. Agricultural export subsidies from the dataset were combined with data from the I-O tables. Preference was given to the agricultural export subsidy dataset, with data from the I-O tables brought in only for missing data indicated by data flags.

We have revised the treatment of export subsidies/taxes for services commodities. In the past, we used the export subsidy/taxes data available in the I-O tables to cover data that are missing from the external protection dataset. We continue to do so for the small number of missing data for non-agricultural merchandise commodities. However, because there is no external data source for services protection, we used to rely completely on protection for services that is extracted from the I-O tables. We have now dropped this practice since not all of the I-O tables report protection data and because the services protection data for some regions may be outdated and/or erroneous.

The export subsidy/tax data for each single region was then expanded bilaterally by assigning the same export subsidy/tax rate uniformly to all partner countries (importers).

16.A.4 ATC Export Tax Equivalents

Estimates of the export tax equivalent (ETE) of the export quotas on textiles and clothing (wearing apparel) exports under the Agreement on Textiles and Clothing (ATC) for 2001 were again provided by Joseph Francois and Dean Spinanger (chapter 16.F). Francois and Spinanger generated the ETE estimates using a non-linear least squares estimation model with bilateral trade data on textiles and clothing, underlying tariffs, and the coverage of the ATC quotas.

The dataset was extended on the exporter side by mapping the region aggregates to the set of standard countries. The importer regions were first mapped to a subset of the standard countries, thereby assigning the data for the EU to all its member states, then to the set of standard countries. The data set was then aggregated to the set of 87 GTAP regions, in both the exporter and importer dimension, using trade weights. A data file with export tax equivalent rates for textiles and wearing apparel exports to all GTAP region importers was then generated for each single GTAP region.

16.A.5 Other Protection Measures

The other protection measures that are included in the GTAP 6 Data Base are anti-dumping duties on the import side and price undertakings and voluntary export restraints (VERs)on the export side. Anti-dumping duties are duties that may be imposed by importers against dumped goods, if dumping causes injury to producers of competing products in the importing country. Price undertakings are agreements between an importer and exporter whereby the exporter agrees to raise the export price of the products above some minimum level to avoid the possibility of an anti-dumping duty. VERs are bilateral arrangements whereby an exporter agrees to restrict exports without the importing country having to make use of tariffs, quotas, or other import controls.

In GTAP 4, data for anti-dumping duties, and voluntary price undertakings were simply inherited from the GTAP version 3 data base and reported for information only. They were not incorporated into the version 4 border wedges. Zero rates were reported for VERs. In GTAP 5, as well as in GTAP 6, due to absence of up-to-date data, zero rates are reported for all three protection measures.

16.A.6 Free Trade Areas

The preparation of the import tariff and export subsidy data files are discussed in sections 16.A.2 and 16.A.3, respectively. Since we are now using preferential rates tariff data, we have stopped implementing our previous approach of applying zero rates for free trade areas (CER, NAFTA, EU, EU-EFTA, and SACU). The export subsidies were adjusted to impose zero rates between free trade areas (FTAs) for affected commodities. We recognize five FTAs in GTAP 6, as shown in table 16.A.2. For NAFTA and the EU-EFTA trade area, we impose zero rates outside the agriculture and food processing sectors; for the EU itself, for the ANZCERTA, and for SACU, we impose zero rates for all sectors, including agriculture and food processing.

Table 16.A.2 Free Trade Areas in GTAP Version 6 Data Base

Free Trade Area	GTAP Member Countries	Commodity Coverage
North American Free Trade Agreement (NAFTA)	USA, CAN, MEX	all commodities except primary agriculture and processed food
Australia New Zealand Closer Economic Relations Trade Agreement (ANZCERTA)	NZL, AUS	all commodities
European Union (EU)	AUT, BEL, DNK, FIN, FRA, DEU, GBR, GRC, IRL, ITA, LUX, NLD, PRT, ESP, SWE	all commodities
European Union -European Free Trade Association (EU-EFTA)	AUT, BEL, DNK, FIN, FRA, DEU, GBR, GRC, IRL, ITA, LUX, NLD, PRT, ESP, SWE, CHE, XEF	all commodities except primary agriculture and processed food
Southern Africa Customs Union (SACU)	BWA, XSC	all commodities

16.A.7 Assembly

The processing of the contributed datasets for each protection instrument was described in the previous sections of this document. A data file for each GTAP region was generated for each protection instrument. In the assembly process, the regional data files for each instrument are simply compiled into generate one data file for each region. The regional protection data files were used for further processing in the data construction process. Each regional protection data file includes the rates for ordinary tariffs, anti-dumping duties, ordinary export subsidies, ATC export subsidies, price undertakings, VERs, and the domestic support data. The domestic support data include the rates of total domestic support and the shares to total payments of output subsidies, intermediate input subsidies, land-based payments, and capital-based payments. Also included in each regional protection data file are the comprehensive rates for import duties and export subsidies representing all import-side and export-side instruments, respectively. The comprehensive rates are the ones used in adjusting the trade value flows in the FIT procedure (chapter 19) to incorporate the trade distortions in the data base.

As noted in the first section of this document, some more processing of the protection data is done further along in the GTAP Data Base construction process. These are done for energy commodities in the energy module (see chapter 17), in the FIT procedure (see chapter 19), and in the global data assembly process (see chapter 21).

The final protection data set is available in the GTAP data base either as explicit revenue values and tax rates or as implicit data calculable from two values of the same data flow. Further discussion about explicit and implicit protection is available in the guide to the GTAP Data Base (chapter 2). A summary tax rates file is generated by the GTAPView software described in chapter 10.