

Guatemala I-O Table for GTAP¹

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1. Introduction

This document describes the steps behind the creation of the first Input-Output (I-O) table of Guatemala for the Global Trade Analysis Project (GTAP). The Guatemala I-O table for GTAP is based on the 2001 Social Accounting Matrix (SAM) built by Alarcon (2006) under the cooperation of Guatemala's *Secretaría General de Planificación* (SEGEPLAN) and the Institute of Social Studies (ISS) in The Hague.

The inclusion of Guatemala into GTAP has had the support of the International Trade and Integration Division of ECLAC. The ECLAC International Trade and Integration Division, United Nations, altogether with other ECLAC Division, has been embarked in the effort to develop and support the application of quantitative tools that allow the analysis of trade policy issues in Latin America and the Caribbean, specially those changes related to Free Trade Agreements (FTAs), Regional Integration Agreements (RIA) and the multilateral negotiations in World Trade Organization (WTO). A useful tool for such analysis is the application of Computable General Equilibrium Models (CGEM).

Under this directive, ECLAC incorporates the first I-O table of Guatemala in the GTAP database³. Guatemala is currently aggregated into the Central American region of GTAP (along with Costa Rica, El Salvador, Honduras, and Panama). The inclusion of Guatemala is part of an effort to disaggregate all Central American countries in the GTAP database.

This document is divided in 4 sections. The next section explains the data and the construction of the SAM, its particular characteristics and its salient economic features. Section 3 describes the process of building the GTAP ready database, outlining some of the assumptions made to set the structure of the source data consistent with GTAP specifications. Finally, section 4 describes briefly the sectoral aggregation and splits.

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³ This is the third time that ECLAC has helped in the inclusion of new or updated I-O data into GTAP. Previous countries include Chile and Nicaragua. (Schushny and Ludena (2007); Ludena and Schushny (2007); and Sánchez, Vos and Ludena, (2008)).

2. Source Data

The 2001 Guatemala's Social Accounting Matrix (SAM) was built under the cooperation of Guatemala's *Secretaría General de Planificación* (SEGEPLAN) and the Institute of Social Studies (ISS) in the Netherlands, with the support of the United Nations Development Program (UNDP) of Guatemala. The Central Bank of Guatemala and the National Institute of Statistics of Guatemala also cooperated in this project.

The SAM of Guatemala has a commodity (product) by industry (activity) setup, and includes 226 commodities and 127 activities. The units are in thousands of local currency (*quetzales*) in nominal terms at 2001 market prices. For ease of manipulation these were aggregated into 66 commodities and 59 activities. Appendix 1 provides a list of commodities in both Spanish and English with descriptions, and Appendix 2 lists all 59 activities in Guatemala's classification. Appendix 3 describes further commodity aggregation from 66 to 50 sectors, and Appendix 4 provides the concordance between those 50 sectors and GTAP 57 sector classification.

One of the salient characteristics of this I-O table is that the SAM used responds to the specific characteristics of the Guatemalan economy, which makes it relevant for policy assessment, especially in trade matters. This study updates Guatemala's I-O tables built by UNDP/ILO (1978), Garbonier (1986) and Bulmer-Tomas and Martin (1992). The construction of this I-O table is in concordance to the 1993 System of National Accounts, and has a larger sectoral disaggregation than previous SAMs or I-O tables. We modify the work Alarcon (2006) (see Table 1) to better fit GTAP data requirements.

Table 1. History of SAM and I-O table construction for Guatemala

Studies	Base year	Number of sectors/activities	Main Objective
SEGEPLAN (1978); I-O Table	1971	11 economic activities	Use in the analysis of a sectoral model used to project employment by type and education level.
Cruz and Serra (1989), Social Accounting Matrix (SAM)	1986	8 productive activities, 4 household types and 6 taxes	NA.
Tomas and Martin (1992), I-O Table	1987	53 economic activities	Economic analysis
Carbonnier, G. (2001), SAM	1986		Analysis of post conflict economies.
SEGEPLAN (2003), SAM	2001	59 economic activities	Construction of a new SAM.
ECLAC (2008), I-O Table	2001	66 economic activities, with emphasis on agricultural products	Inclusion of Guatemala in GTAP database, v7.0

3. I-O Table Adaptation for GTAP

The process of adaptation of the original data into GTAP format was done in two stages. The first stage (Figure 1) transforms the SAM data into GTAP format, that is, transforms the data into commodity by commodity format, splitting domestic from import use, with and without taxes, etc. The second stage (discussed in Section 4 and Figure 2) aggregates the data aiming at mapping multiple Guatemalan sectors into single GTAP sectors. We describe the process in the following paragraphs.

3.0 Data Preconditioning

Before we could start modifying the data, we modified several things, so the process of transforming to the into GTAP format. These modifications included:

- The original SAM from SEGEPLAN had a total of 127 activities, distributed in three types of activities: a) Market production, b) Production for final use, and c) Other Non-market production. Within these three types, there were activities that had data in two or more of these types of activities. For that reason, we consolidated the data and aggregated those activities that had data in two or more types of activities.
- The original data had a total of 226 commodities and 127 activities. To better match GTAP sectors and ease of manipulation, we aggregated the data into 66 commodities and 50 activities (Appendix 1 and Appendix 2).
- With the commodity aggregation, Electricity, Gas and Water production and distribution were merged. This merge affected Electricity, Gas and Water Distribution Margins, which added up to zero after the merge.
- There were some negative cells in intermediate use (i.e. corn use by beverages and use of forestry products in paper and paper products production), which were manually adjusted to make them zero. To maintain balance we adjusted change in stocks by the same value amount.

3.1 Make Matrix

Because the GTAP database is set up as commodity by commodity, the multi-product (commodity by industry) Make table of Guatemala had to be converted into a single-product (commodity by commodity) table. We diagonalized the Make matrix by moving values of a commodity j across industries i to industry j . That is, we aggregated the product of each of the various industries which produce the same commodity to yield a sector that produces a single commodity. As a consequence, there was no longer room for secondary production in the Guatemalan matrix.

3.2 Direct Purchases and FISIM

Values of “foreign direct purchases by residents” were reallocated to gain accounting consistency following the SAM analytical framework. According to the 1993 United Nations System of National Accounts, “direct purchases” refer to acquisitions of, for example, air tickets and other transport-related purchases. For that reason, they were recorded as intermediate consumption for the activities providing transport and business

services; final household demand, equal to the net value of resident household purchases minus non-residents exports; final demand of transport exports; and, imports of transport services in the case of direct purchases of households and government overseas.

We also merged the Financial Intermediation Services Indirectly Measured (FISIM) with the activity/commodity of “Financial Services”. To do this, we first estimated a share vector based on the “net operating surplus” (NOS) that is part of the activities’ value added. We used these shares to “eliminate” the corresponding negative value added of FISIM and record it as part of financial services’ value added (in this sector’s NOS).

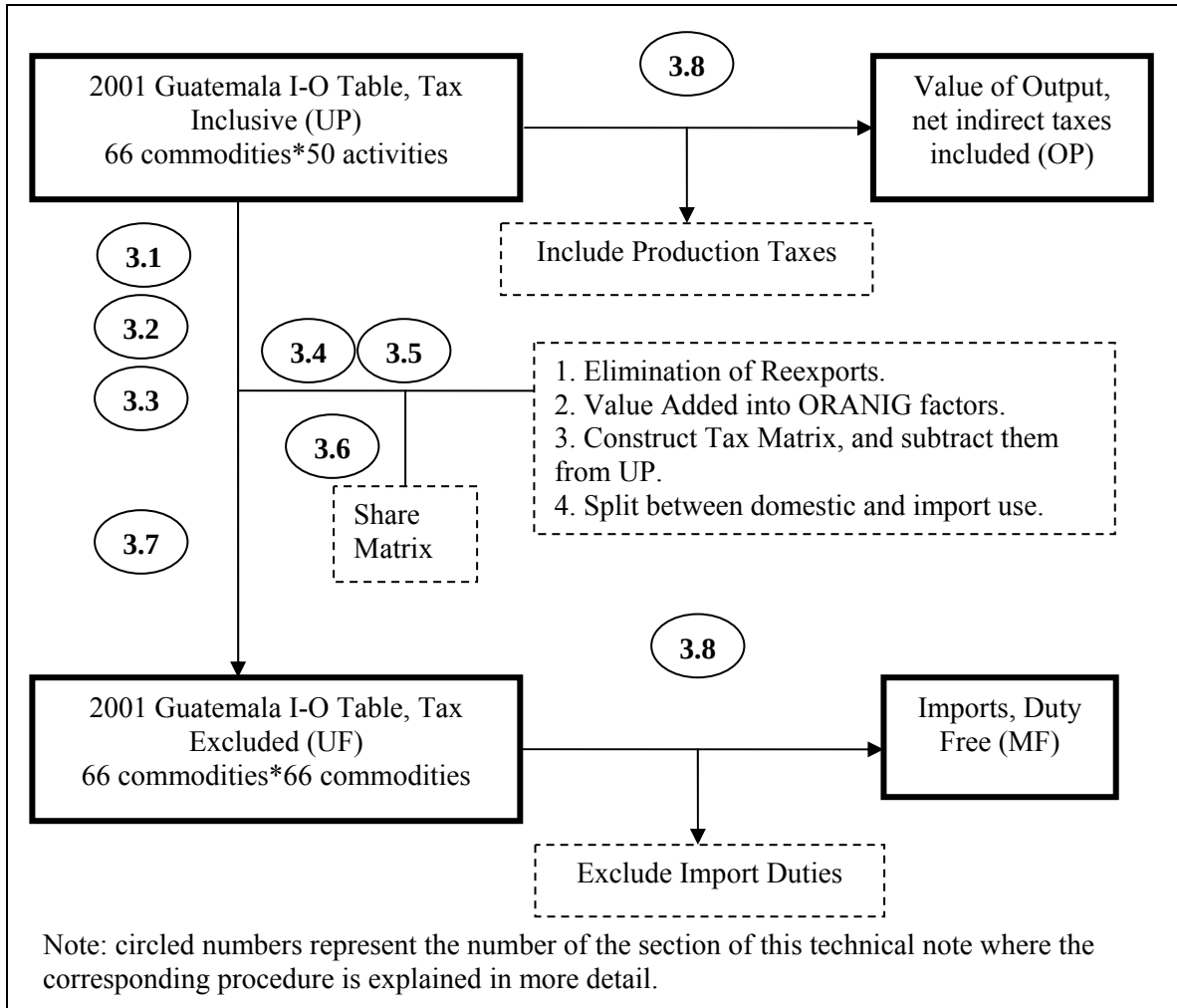


Figure 1. Guatemalan I-O adaptation from SEGEPLAN SAM to GTAP Database v. 7.0 (First Stage)

3.3 Value added to ORANIG factors (labor, capital and land)

Value added in the source data accounted for labor and capital as a) wages and salaries, b) other production taxes, c) mixed income, and d) net operating surplus (profits). Total value added was distributed across these factors of production as follows: “wages and salaries” as labor and “net operating surplus” as capital. The “mixed income” was allocated proportionally between labor and capital using the share of these factors by

industry. Value added for land was set to zero for all sectors, since we did not have data available to split this factor from the available data. It is worth mentioning though, that capital is a composite factor that, due to lack of disaggregation in the national accounts of Guatemala, also accounts for the retribution to the land factor (and to any other physical capital stock such as livestock and so on).

3.4 Taxes: construction of the tax matrix

Four types of taxes were registered in the Supply-Use data of Guatemala's original SAM, namely: a) value-added tax (VAT), b) Subsidies, c) Commodity Taxes (except VAT and tariffs), d) import tariffs and e) Production and Import Taxes. The first four taxes are indexed by commodity and the last one is included within value added and indexed by activity. Net Indirect Taxes on Production are net payments that production units make/receive to the government and are later used to estimate total output (see section 3.6).

We created two tax matrices, allocating the first three tax vectors (VAT, Commodity Taxes and Subsidies) to one matrix and creating a tariff matrix. We distributed all these taxes across intermediate and final demand (excluding change in stocks and exports) using a share matrix of product consumption in intermediate and final demand. The tariff matrix was later added to the import component of UP.

3.5 Use Matrix, tax inclusive (UP), and tax excluded (UF)

To estimate the "Use matrix, tax inclusive" (UP), we first included the values of the column vector called "Trade Margins" into the commodity "Trade" of the modified commodity-by-commodity "Use matrix". We followed the same procedure for "Transport Margins" as these were included in the "Transport" sector. These two adjustments enabled capturing margins across commodities and allowed to maintain the balance between sales and costs.

To produce the "Use matrix, tax excluded" (UF), we subtracted the tax matrix and the tariff matrix estimated that is introduced in section 3.4 from the UP matrix. However, both matrices needed to be split between domestic and import use. The next section explains how this step was implemented.

3.6 Split between domestic and import use

In the 2001 SAM for Guatemala, a separate column vector reports total imports by commodity. To split the UP and UF matrices between domestic and import use, we first estimated a share matrix of intermediate and final demand use by product (excluding exports, which are allocated entirely to domestic use). For each row of the total use matrix, we compute the percentage of the row total allocated to each sector. We then estimated an import matrix (imports plus imports duties) by multiplying each commodity total by the appropriate percentage for each sector across intermediate and final demand. That is, an import matrix was generated as a result of pro-rating the totals across uses by applying the structure implied by the total use matrix. We estimated domestic use (tax excluded) by subtracting the import matrix from the UF matrix. All exports were included in the domestic use matrix.

To estimate both domestic and import use tax inclusive, we first split the matrix of taxes (IVA) into domestic and import taxes. We did this by using a share matrix of import use in total use, estimated by dividing the import use matrix (tax excluded) by the UF matrix. Using this share matrix, we calculated two tax matrices, one for domestic use and one for import use. We then added these two matrices to the corresponding domestic and import use (tax excluded) to calculate both domestic and import use, tax inclusive.

The resulting domestic and import tax matrices were finally subtracted from both domestic and import use (tax inclusive) to obtain both domestic and import use free of taxes.

3.7 Reexports

During the process of splitting domestic from import use, we found that some sectors had reexports. However, GTAP does not support reexports in the database. For this reason, we eliminated re-exports from Guatemala's I-O table. Specifically, we subtracted reexports from total exports, and from total imports (including import duties). We estimated shares of reexports and subtracted those percentages from the total value of imports, tariffs and exports. The reexport percentages used were: "Primary Products of precious metals and non ferrous metals" (8.19%) and "Water Transport Services" (73.72%).

3.8 Output (OP) and imports, duty free (MF)

To obtain a vector of output of sector i non-commodity net indirect tax included (vector "OP" in GTAP notation), we added together the sum of domestic and imports intermediate use, value added (labor and capital) and Net Indirect Taxes on Production. Finally, to produce a vector of imports by commodities with import duties excluded (vector "MF" in GTAP notation) we removed import duties from the vector of total imports by commodity (tax excluded).

4. Commodity aggregation and splits

Guatemala's 66 sectors were aggregated into 50 sectors, always maintaining the accounting balance of the matrix (Appendix 3). This first aggregation was found necessary as to map multiple Guatemala's sectors into single GTAP sectors. The sectoral breakdown to match the 50 aggregated sectors of the Guatemalan SAM to the 57 GSC2 sectors was performed at the GTAP Center, using the cost structure of their "GTAP Representative Table" and the agriculture I-O split procedure (chapter 13, Dimaranan and McDougall, 2002). Appendix 4 shows the mapping from the 50 aggregated sectors to GTAP 57 sectors.

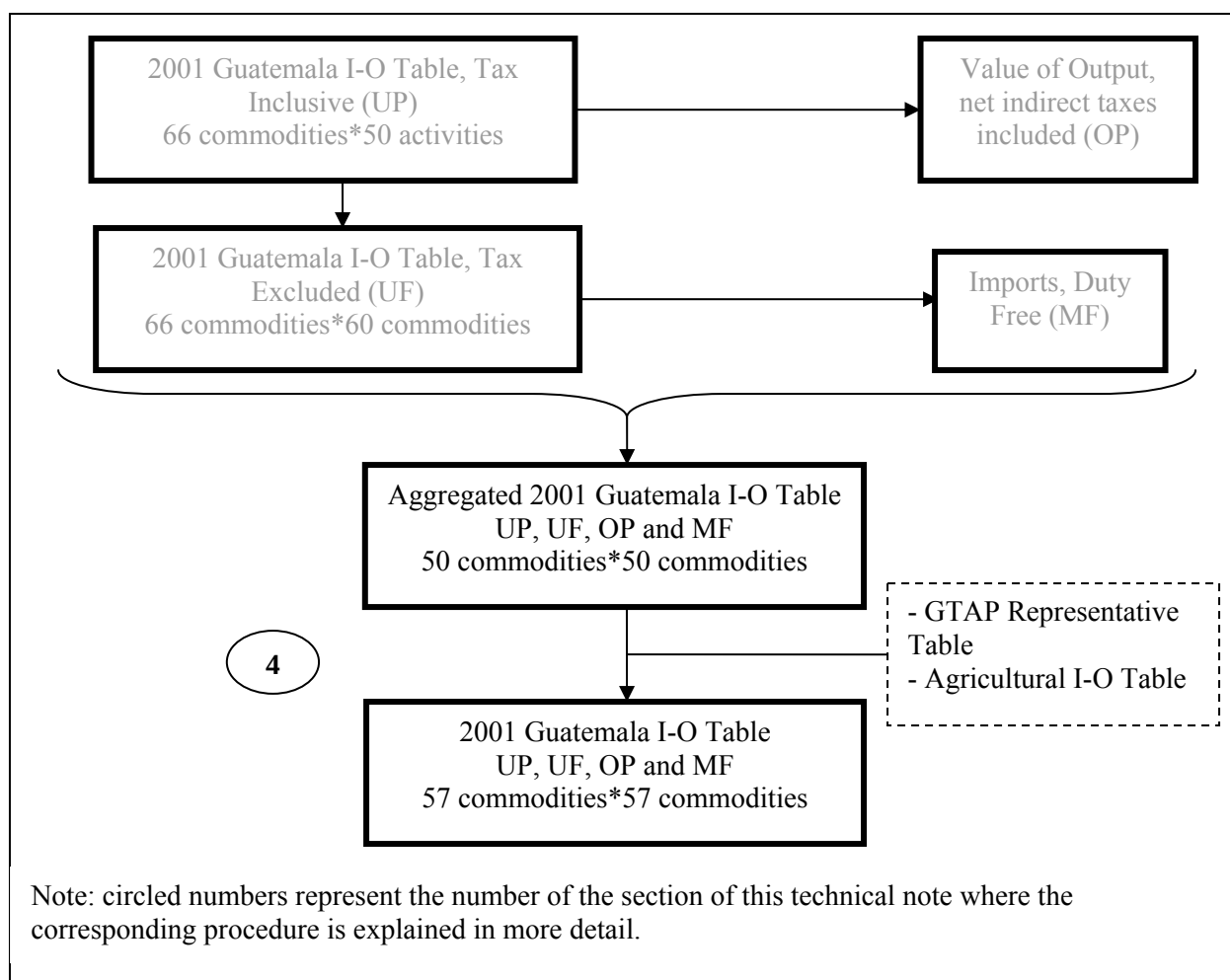


Figure 2. Guatemalan I-O adaptation from SEGEPLAN SAM to GTAP Database v. 7.0 (Second Stage)

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Appendix 1. Commodity classification for Guatemala used for GTAP format

Code	Product (in Spanish)	Product	Description
01	Café	Coffee	Coffee
02	Banano	Bananas	Bananas
03	Cardamomo	Cardamom	Cardamom
04	Maíz	Corn	Corn
05	Sorgo y Otros cereales n.c.p.	Sorghum and other cereals nec	Sorghum and other cereals nec
06	Arroz en cáscara	Paddy Rice	Paddy Rice
07	Trigo	Wheat	Wheat
08	Tubérculos, raíces hortalizas y legumbres	Tubers, roots, and vegetables	Potato, other roots; Peas, broccoli, herbs and other vegetables; Beans and other pulses
09	Frutas	Fruits	Melon, mango, berries, other fruits and nuts
10	Semillas y Frutos Oleaginosos	Oilseeds and Oil fruits	Sesame, soybeans, cotton seed, other oil seeds and fruits
11	Otros Cultivos (Plantas vivas, Bebestibles, tabaco sin elaborar)	Other crops (Live plants, Beverage crops, raw tobacco)	Green tea, cacao, other beverage crops, spices; Live plants, cut flowers and seeds; Tobacco, not, wholly or partly stemmed/stripped
12	Plantas Utilizadas en la Fabricación de Azúcar	Sugar crops	Sugar cane and other sugar crops
13	Materias Vegetales sin Elaborar n.c.p.	Raw vegetable materials	Cotton and other raw vegetable materials
14	Ganado bovino, ovejas, cabras, caballos, mulas y burdeganos	Bovine Cattle	Bovine cattle, sheep, goats, horses, , etc.
15	Ganado Porcino, Aves de Corral, Otros Animales, Huevos, Miel y otros productos animales	Pigs, poultry, other animals and animal products	Pigs, poultry, other animals, eggs, honey, wool and other animal products
16	Leche sin elaborar	Raw milk	Raw milk
17	Lana	Wool	Wool
18	Productos de la Silvicultura y Extracción de Madera	Forestry and forestry products	Forestry and forestry products
19	Pescado y Otros Productos de la Pesca	Fishing and fish products	Tuna and other live fish, shrimp and other fishing products
20	Petróleo Crudo y Gas Natural	Crude Oil and Natural Gas	Crude oil and natural gas
21	Piedra, Arena, Arcilla y Otros Minerales	Stone, Sands Clay and Other Minerals	Construction slates, sands and clay; Metallic minerals, salt and other non metallic minerals
22	Carne y despojos comestibles de ganado vacuno (fresca, refrigerada o congelada)	Bovine Meat and Meat Products	Bovine meat, fresh, chilled or frozen, and other meat products
23	Carne y despojos comestibles de ganado porcino, aves y otros productos cárnicos	Pigs and Poultry Meat and Meat Products	Pig and poultry meat, fresh, chilled or frozen, and other meat products
24	Aceites y Grasas Animales y Vegetales	Vegetable and Animal Oils and Fats	Vegetable oil, vegetable lard, and other products
25	Productos Lácteos	Dairy Products	Processed milk and other milk products

26	Arroz sin cáscara	Processed rice	Processed rice
27	Azúcar	Sugar	Sugar and sugar products
28	Otros Alimentos	Other Food Products	Fish fillets and livers, frozen shrimp, other fish products; Processed vegetables and fruits, fruit juices, jam; wheat flour, other flours and milling products; Animal Food and Pellets; Bread and other bakery products; Macaroni, spaghetti and similar products; Starch, chocolate, candy and other food products
29	Bebidas y Productos del Tabaco	Beverages and Tobacco Products	Ethyl alcohol, liquors, wines and spirits, beer, malt; Non alcoholic beverages, bottled mineral waters; Tobacco products
30	Hilados e hilos; tejidos de fibras textiles; artículos textiles (excepto prendas de vestir)	Textile fibers and textile products	Textile fibers, textile products
31	Tejidos de punto o ganchillo; prendas de vestir; adobo y teñido de pieles	Wearing Apparel	Wearing Apparel
32	Cuero y Productos de Cuero; Calzado	Leather and Leather products; footwear	Leather and leather products; shoes and shoe parts
33	Madera y Productos de Madera, excepto Muebles; Artículos de Corcho, Paja y Materiales Trenzables	Wood and wood products, except furniture	Wood and wood products, except furniture
34	Pasta De Papel, Papel Y Productos De Papel; Impresos Y Artículos Análogos	Paper and paper products; Printing and Publishing	Paper and paper products; printing and publishing.
35	Productos de Horno de Coque; Productos De Petróleo Refinado; Combustibles Nucleares	Refined Oil and Coal Products; Nuclear Fuels	Gasoline, diesel, fuel oil and bunker, kerosene, etc.
36	Productos Químicos, Caucho y Plásticos	Chemical, Rubber and Plastic Products	Fertilizers, paint, pharmaceutical products, soap; Tires and other rubber products; plastic products
37	Otros Productos No Metálicos	Other Non Metallic Products	Glass, ceramic products; other mineral non metallic products
38	Productos básicos de hierro y acero	Basic Iron and Steel Products	Iron and steel Products
39	Productos primarios de metales preciosos y metales no ferrosos	Primary Precious Metals and Non Ferrous Metal Products	Primary Precious Metals and non ferrous metal Products
40	Productos elaborados de Metal	Manufactured Metal Products	Metal products
41	Maquinaria para usos generales	Machinery for General Use	Machinery for General Use
42	Maquinaria para usos especiales	Machinery for Special Use	Machinery for Special Use
43	Maquinaria de oficina, contabilidad e informática	Office, Accounting and IT Machinery	Office and electric machinery and equipment, ,
44	Maquinaria y aparatos eléctricos	Machinery and Electrical Equipment	Machinery and electrical equipment
45	Equipo y aparatos de radio, televisión y comunicaciones	Radio, TV and communications Equipment	Radio, TV and communications equipment
46	Aparatos médicos, instrumentos ópticos y de precisión	Medical, optical and precision equipment	Medical, optical and precision equipment

47	Equipo de transporte	Transport Equipment	Transport equipment
48	Otras Manufacturas	Other Manufactures	Jewelry, musical instruments, sport articles, toys; Waste from food and tobacco, non metal and metal ind.
49	Energía Eléctrica	Electricity	Electricity generation and distribution
50	Gas	Gas	Gas, steam and hot water generation and distribution
51	Agua Natural	Natural Water	Water generation and distribution
52	Construcciones	Construction	Construction
53	Servicios de Comercio	Trade Services	Trade services
54	Alojamiento; Servicios de Suministro de Comidas y Bebidas	Hotels Services; Food and Beverage Services	Hotels; food and beverage procurement services
55	Servicios de Transporte Terrestre, agencias de viajes y otros	Land Transport Services, travel agencies and others	Land transport services for freight and passengers
56	Servicios de Transporte por vía Acuática	Water Transport Services	Water transport services for freight and passengers
57	Servicios de Transporte por vía Aérea	Air Transport Services	Air transport services for freight and passengers
58	Servicios Postales, de Mensajería y Telecomunicaciones	Postal and Telecommunications Services	Postal Services, radio and satellite TV services
59	Servicios de Intermediación Financiera, excepto seguros y fondos de pensiones	Financial Services (except Insurance)	Financial Services (except insurance)
60	Servicios de seguro, reaseguro y fondos de pensiones	Insurance Services and Pension Funds	Insurance Services and Pension Funds
61	Servicios auxiliares de la intermediación financiera	Auxiliary Financial Services	Auxiliary Financial Services
62	Servicios auxiliares de seguros y fondos de pensiones	Auxiliary Insurance Services	Auxiliary Insurance Services
63	Servicios de alquiler de vivienda	Dwellings and Real State services	Real State renting and other services
64	Servicios de Empresas	Business Services	Legal, advertising, maintenance, and other business serv.
65	Otros Servicios Comunitarios, Sociales y Personales; Servicios Domésticos	Other Services	Other Community, Social and Personal Services; Domestic Services
66	Servicios de Admin. Pública y Otros Serv. para la Comunidad en General (Educación, Salud, Alcantarillado); Serv. de Seguridad Social de Afiliación Obligatoria	Public Administration, Defense, Education, Health and Social Security Services	Public Administration and Social Security Services; Education Services; Hospital, medical, dental and other human health services; Veterinary Services; Water and Sewage, Waste Management and environmental Services; Services from extraterritorial organizations and entities

Appendix 2. Activity classification in Guatemala

No.	Activity	Activity (in Spanish)
1	Coffee cultivation	Cultivo de café
2	Banana cultivation	Cultivo de banano
3	Cardamom cultivation	Cultivo de cardamomo
4	Cultivation of cereals and other crops	Cultivo de cereales y otros cultivos n.c.p.
5	Cultivation of roots, tubers, vegetables	Cultivo de tubérculos, raíces, hortalizas y legumbres, especialidades hortícolas y productos de vivero
6	Cultivation of fruits and nuts, beverage crops and spices	Cultivo de frutas y nueces, plantas cuyas hojas se utilizan para preparar bebidas, y especias
7	Cultivation of other Crops	Otros Cultivos n.c.p.
8	Raising of bovine cattle, sheep, goats, horses, mules	Cría de ganado vacuno, ovejas, cabras, caballos, asnos, mulas y burdéganos
9	Raising of pigs, poultry, other animals; Animal products and services	Cría de cerdos, aves de corral, otros animales, productos animales y servicios
10	Forestry and related services; Hunting	Silvicultura, extracción de madera y actividades de servicios conexas, y caza
11	Fishing (Fish catching and farming, Shrimp and lobster catching, Shrimp farming, Crustaceans, mollusks and other aquatic products catching)	Pesca (Captura de peces, Cría de peces en granjas piscícolas, Captura de camarones y langostas, Cultivo de camarones, Captura de crustáceos y moluscos y otros productos acuáticos)
12	Extraction of oil and natural gas	Extracción de petróleo y gas natural
13	Extraction of Stone, sand, clay and other Metallic and Non Minerals	Extracción de piedra, arena, arcilla y otros minerales metálicos y no metálicos
14	Slaughtering of bovine cattle	Matanza de ganado vacuno
15	Slaughtering of pigs, poultry and other meat	Matanza de ganado porcino, aves y otras carnes
16	Manufacturing of oils and fats from vegetable and animal origin	Elaboración de aceites y grasas de origen vegetal y animal
17	Milling of rice	Beneficios de arroz
18	Sugar Manufacturing	Elaboración de azúcar
19	Manufacturing of milk products	Elaboración de productos lácteos
20	Manufacturing of other food products	Elaboración de otros productos alimenticios
21	Manufacturing of beverages and Tobacco products	Elaboración de bebidas y productos de tabaco
22	Manufacturing of textile products	Fabricación de Hilados y otros productos textiles
23	Manufacturing of wearing apparel, except leather pieces	Fabricación de de prendas de vestir, excepto prendas de piel
24	Leather and Footwear manufacturing	Fabricación de Cuero y Productos de Cuero; Fabricación de calzado
25	Manufacturing of wood products, cork, straw, except furniture	Fabricación de Productos de Madera, excepto muebles
26	Manufacturing of paper and paper products; Printing and publishing activities	Fabricación de papel y productos de papel; edición e impresión de papel
27	Manufacturing of refined oil and coal products and nuclear fuel	Fabricación de coque, productos de la refinación de petróleo y combustible nuclear
28	Manufacturing of chemical, rubber and plastic products	Fabricación de productos químicos, caucho y plástico
29	Manufacturing of Other Non Metallic Products (glass, clay, concrete, cement and plaster)	Fabricación de Otros Productos No Metálicos (vidrio, arcilla, cemento, cal y yeso)

30	Manufacturing of common metals	Fabricación de metales comunes
31	Manufacturing of metal products, except machinery and equipment	Fabricación de productos elaborados de metal, excepto maquinaria y equipo
32	Manufacturing of machinery and equipment	Fabricación de maquinaria y equipo, n.c.p.
33	Manufacturing of other products (Other manufacturing industries, furniture, Recycling)	Fabricación de otras manufacturas (otras manufacturas, muebles, reciclaje)
34	Generation, collection and distribution of electric energy	Generación, captación y distribución de energía eléctrica
35	Distribution of gaseous fuels through pipes, supply of vapor and hot water	Distribución de combustibles gaseosos por tubería, suministro de vapor y agua caliente
36	Collection, purification and distribution of water	Captación, depuración y distribución de agua
37	Construction	Construcción
38	Wholesale and retail trade	Comercio al por mayor y al por menor
39	Hotels, Restaurants, bars and canteens	Hoteles; Restaurantes, bares y cantinas
40	Land Transport and pipes, travel agencies and others	Transporte por Vía Terrestre; Transporte por Tuberías, Agencias de viajes y otros
41	Water Transport	Transporte por Vía Acuática
42	Air Transport	Transporte por Vía Aérea
43	Postal services and Telecommunications	Servicios postales y de correo y Telecomunicaciones
44	Financial intermediation, except financing of insurance plans and pensions; SIFMI	Intermediación Financiera, excepto la Financiación de Planes de Seguros y Pensiones; SIFMI
45	Financing of insurance plans and pensions, except plans of mandatory Social Security	Financiación de Planes de Seguros y de Pensiones, excepto los Planes de Seguridad Social de Afiliación Obligatoria
46	Auxiliary activities of financial intermediation	Actividades Auxiliares de la Intermediación Financiera
47	Dwellings and house renting	Alquiler de vivienda
48	Business Services	Servicios Empresariales
49	Other Services (Business organizations activities; Domestic Services)	Otros Servicios (Actividades de organizaciones empresariales y de empleadores; Hogares privados con servicio doméstico)
50	Public administration and defense (Education, Health, Social Security)	Administración pública y defensa (Enseñanza, Salud, Seguridad Social)

Appendix 3. Commodity aggregation of Guatemala's sectors

No.	Aggregated Sectors (50)	Original Sectors (66)	No.
01	Paddy rice	Paddy rice	6
02	Wheat	Wheat	7
03	Cereals	Corn Sorghum and other cereals nec	4, 5
04	Fruits and Vegetables	Tubers, roots, and vegetables Fruits Bananas	2, 8, 9
05	Oilseeds and Oil fruits	Oilseeds and Oil fruits	10
06	Sugar Crops	Sugar Crops	12
07	Raw vegetable materials	Raw vegetable materials	13
08	Other crops	Coffee Cardamom Other crops (Live plants, Beverage crops, raw tobacco)	1, 3, 11
09	Bovine Cattle	Bovine Cattle	14
10	Pigs, poultry, other animals and animal products	Pigs, poultry, other animals and animal products	15
11	Raw milk	Raw milk	16
12	Wool	Wool	17
13	Forestry and forestry products	Forestry and forestry products	18
14	Fishing and fish products	Fishing and fish products	19
15	Crude Oil and Natural Gas	Crude Oil and Natural Gas	20
16	Stone, Sands Clay and Other Minerals	Stone, Sands Clay and Other Minerals	21
17	Bovine Meat and Meat Products	Bovine Meat and Meat Products	22
18	Pigs and Poultry Meat and Meat Products	Pigs and Poultry Meat and Meat Products	23
19	Vegetable and Animal Oils and Fats	Vegetable and Animal Oils and Fats	24
20	Dairy Products	Dairy Products	25
21	Processed rice	Processed rice	26
22	Sugar	Sugar	27
23	Other Food Products	Other Food Products	28
24	Beverage and Tobacco Products	Beverage and Tobacco Products	29
25	Textile fibers and textile products	Textile fibers and textile products	30
26	Wearing Apparel	Wearing Apparel	31
27	Leather and Leather products; footwear	Leather and Leather products; footwear	32
28	Wood and wood products	Wood and wood products, except furniture	33
29	Paper and paper products	Paper and paper products; Printing and Publishing	34
30	Refined Oil and Coal Products	Refined Oil and Coal Products; Nuclear Fuels	35
31	Chemical, Rubber and Plastic Products	Chemical, Rubber and Plastic Products	36
32	Other Non Metallic Products	Other Non Metallic Products	37
33	Common Metals	Basic Iron and Steel Products Primary Precious Metals and Non Ferrous Metal Products Manufactured Metal Products	38, 39, 40
34	Machinery and equipment nec	Machinery for General Use	41, 42, 46

		Machinery for Special Use Medical, optical and precision equipment	
35	Electronic equipment	Office, Accounting and IT Machinery Machinery and Electrical Equipment Radio, TV and communications Equipment	43, 44, 45
36	Transport Equipment	Transport Equipment	47
37	Other Manufactures	Other Manufactures	48
38	Electricity	Electricity	49
39	Gas	Gas	50
40	Natural Water	Natural Water	51
41	Construction	Construction	52
42	Trade and Hotel Services	Trade Services Hotels Services; Food and Beverage Services	53, 54
43	Transport and Warehousing Services	Land Transport Services, travel agencies and others Water Transport Services Air Transport Services	55, 56, 57
44	Postal and Telecommunications Services	Postal and Telecommunications Services	58
45	Financial Services	Financial Services (except Insurance) Auxiliary Financial Services	59, 61
46	Insurance Services	Insurance Services and Pension Funds Auxiliary Insurance Services	60, 62
47	Dwellings and Real State services	Dwellings and Real State Services	63
48	Business Services	Business Services	64
49	Other Services	Other Services	65
50	Public Administration, Education, Health	Public Admin. and Social Security Services	66

Appendix 4. Concordance between GSC2 sectors and Guatemala's I-O table

GSC2 No.	GSC2 code	GSC2 description	Guatemala commodity name	Guatemala commodity No.
1	pdr	Paddy rice	Paddy rice	1
2	wht	Wheat	Wheat	2
3	gro	Cereal grains nec	Cereals	3
4	v_f	Vegetables, fruit, nuts	Fruits and Vegetables	4
5	osd	Oil seeds	Oilseeds and Oil Fruits	5
6	c_b	Sugar cane, sugar beet	Sugar Crops	6
7	pfb	Plant-based fibers	Raw vegetable materials	7
8	ocr	Crops nec	Other Crops	8
9	ctl	Cattle, sheep, goats, horses	Bovine Cattle	9
10	oap	Animal products nec	Pigs, poultry, and other animals	10
11	rmk	Raw milk	Raw milk	11
12	wol	Wool, silk-worm cocoons	Wool	12
13	for	Forestry	Forestry and forestry products	13
14	fsh	Fishing	Fishing and fish products	14
15	col	Coal	Crude Oil and Natural Gas	15
16	oil	Oil	Crude Oil and Natural Gas	15
17	gas	Gas	Crude Oil and Natural Gas	15
18	omn	Minerals nec	Stone, Sands Clay and Other Minerals	16
19	cmt	Meat: cattle, sheep, goats, horse	Bovine Meat and Meat Products	17
20	omt	Meat products nec	Pigs and Poultry Meat and Meat Products	18
21	vol	Vegetable oils and fats	Vegetable and Animal Oils and Fats	19
22	mil	Dairy products	Dairy Products	20
23	pcr	Processed rice	Processed rice	21
24	sgr	Sugar	Sugar	22
25	ofd	Food products nec	Other Food Products	23
26	b_t	Beverages and tobacco products	Beverage and Tobacco Products	24
27	tex	Textiles	Textile fibers and textile products	25
28	wap	Wearing apparel	Wearing Apparel	26
29	lea	Leather products	Leather and Leather products; footwear	27
30	lum	Wood products	Wood and wood products	28
31	ppp	Paper products, publishing	Paper and paper products	29
32	p_c	Petroleum, coal products	Refined Oil and Coal Products	30
33	crp	Chemical, rubber, plastic prods	Chemical, Rubber and Plastic Products	31
34	nmn	Mineral products nec	Other Non Metallic Products	32
35	i_s	Ferrous metals	Common Metals	33
36	nfm	Metals nec	Common Metals	33
37	fmp	Metal products	Common Metals	33
38	mvh	Motor vehicles and parts	Transport Equipment	36
39	otn	Transport equipment nec	Transport Equipment	36
40	ele	Electronic equipment	Electronic equipment	35
41	ome	Machinery and equipment nec	Machinery and equipment nec	34
42	omf	Manufactures nec	Other Manufactures	37
43	ely	Electricity	Electricity	38
44	gdt	Gas manufacture, distribution	Gas	39
45	wtr	Water	Natural Water	40

Appendix 4 (Continued)

GSC2 No.	GSC2 code	GSC2 description	Guatemala commodity name	Guatemala commodity No.
46	cns	Construction	Construction	41
47	trd	Trade	Trade and Hotel Services	42
48	otp	Transport nec	Transport and Warehousing Services	43
49	wtp	Sea transport	Transport and Warehousing Services	43
50	atp	Air transport	Transport and Warehousing Services	43
51	cmn	Communication	Postal and Telecommunications Services	44
52	ofi	Financial services nec	Financial Services	45
53	isr	Insurance	Insurance Services	46
54	obs	Business services nec	Business Services	48
55	ros	Recreation and other services	Other Services	49
56	osg	PubAdmin/Defence/Health/Educat	Public Administration, Education, Health	50
57	dwe	Dwellings	Dwellings and Real State services	47