11.B

Australia

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11.B.1 Overview

This research memorandum describes the methodology behind the creation of the Australian data base for the Global Trade Analysis Project (*GTAP*) model. The GTAP model is a multi-regional, computable general equilibrium model of the world economy widely used to undertake policy analyses on both a global and national basis. Providing the Australian data base for this model is part of the Productivity Commission's commitment as a key member of the GTAP consortium.

The process of creating an Australian data base suitable for the GTAP model involved:

- Creating a single-product version of the Monash data base (data base B);
- Making a number of corrections to data base B to produce data base C;
- Establishing a concordance between Monash and the GTAP data base to determine the extent of disaggregation of data base C that is required;
- Obtaining data on the commodities and industries which require disaggregation (available at the Input Output Commodity Classification (*IOCC*) by I-O level);
- Creating a IOCC by Monash data base from the IOCC by I-O data base;
- Establishing a concordance between IOCC and Monash;
- Using commodity-specific compositional shares from the IOCC by Monash data base to expand the commodity structure of data base C to produce data base D;
- Expanding the industry structure of data base D to data base E; and finally
- Aggregating data base E into GTAP format to produce data base F.

11.B.2 Preparing the Monash Data Base

The starting point for this exercise was the Monash 1993-94 input-output tables (data base A in figure 11.B.1). Monash is a computable, general equilibrium model of the Australian economy containing 122 commodities and 119 industries. The list of Monash commodities is presented in table 11.B.A1.

Because the GTAP model (and hence its data base) is single-product[1] in nature, the multi-product Monash data base had to be converted to a single-product data base. Table 11.B.1 presents the output of a typical Monash multi-product industry.

Table 11.B.1 Output Composition of the Wheat-Sheep Industry

Commodity Produced	Total Production ($ million)	Share of Industry Output (percent)
Wool	1078.14	15.3
Sheepmeat	370.64	5.3
Wheat	2079.47	29.5
Barley	850.52	12.1
Other grains	854.67	12.1
Beef cattle	1446.36	20.5
Hay and fodder	360.54	5.1
Total	7040.35	100.0

Note: Totals may not sum due to rounding.
Source: 1993-94 Monash data base.

Each multi-product industry in the Monash model is separated into the outputs it produced. This meant that there was a Wheat-sheep industry that produced wool, a Wheat-sheep industry that produced sheepmeat, a Wheat-sheep industry that produced wheat, and so on. Each of these new industries has the same cost structure as their parent industry, the Wheat-sheep industry.

The next step in this process of creating a single-product data base was to aggregate each of the various industries which produced wool to yield a Wool industry, each of the various industries which produced sheepmeat to yield a Sheepmeat industry and so on. These new industries had a cost structure that was a share-weighted sum of the cost structure of the parent industries that produced these outputs. This process yielded a single product Monash data base (data base B in figure 11.B.1).

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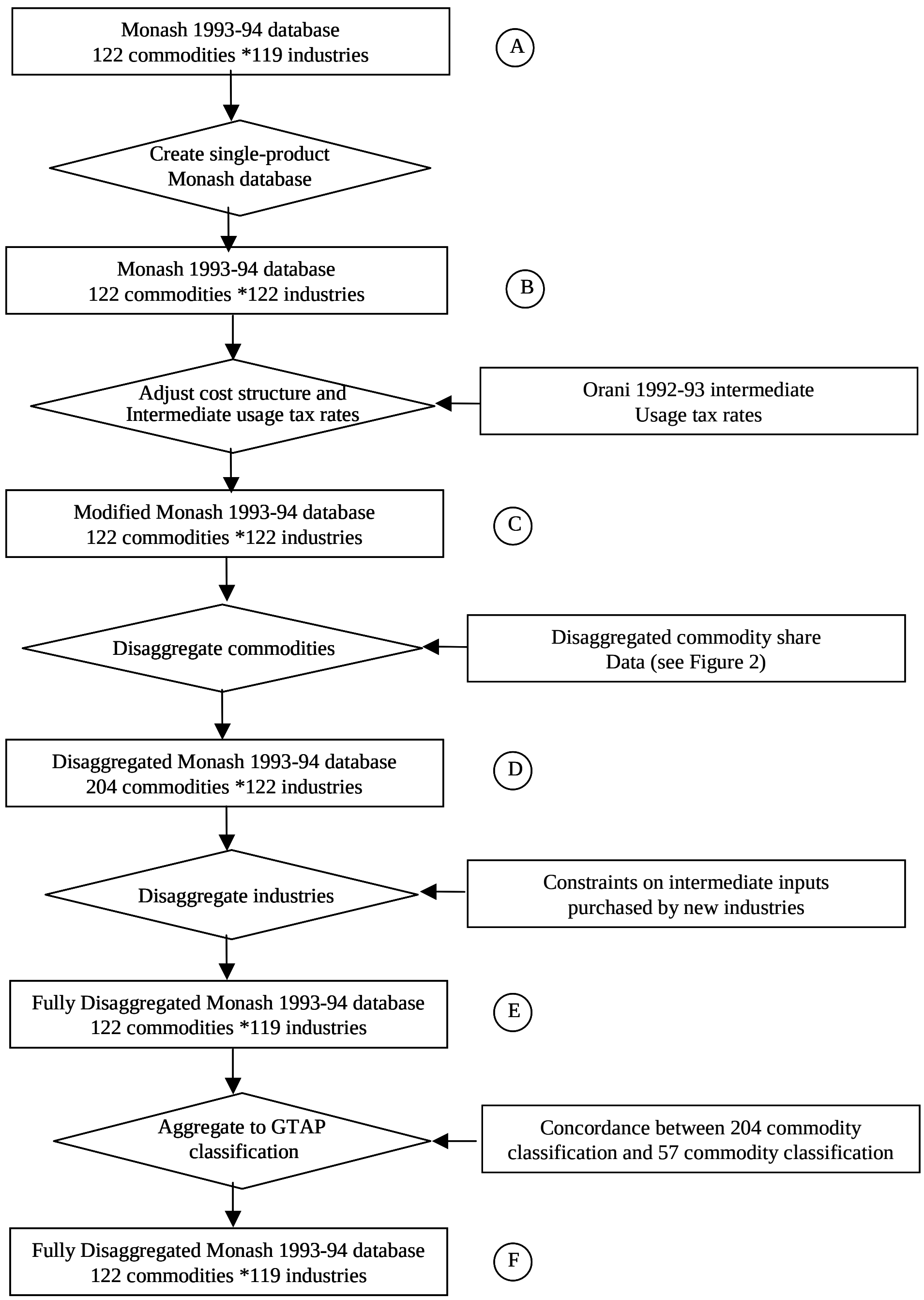
[1] By single-product, we mean that each industry produces only one commodity *and* each commodity is produced by only one industry.

Figure 11.B.1 Process for Creating the Australian Data Base for the GTAP Data Base



Next, two corrections were made to Data base B. The first correction was made to the Food Products industry. During the construction of the Monash model, two new industries, Sugar and Seafood, were split out from the Food Products industry. During this process, the cost structure of the Food Products industry was applied uniformly across the three new industries[2]. This meant that the pattern of input usage for the three industries was the same as for the Food Products industry, leading to some implausible input uses/allocations (table 11.B.2).

Table11.B.2 Selected Domestic Intermediate Usage in the Sugar, Seafood and Other Food Products Industries

Intermediate Input	Sugar		Seafood		Other Food products	
	$ Million	Percent of Usage	$ Million	Percent of Usage	$ Million	Percent of Usage
Barley	11	1	7	1	35	1
Sugar cane	189	19	126	19	617	19
Fishing	33	3	22	3	106	3
Meat products	56	6	37	6	183	6
Total food inputs	558	59	391	59	1914	59
Total non food inputs	410	41	273	41	1335	41
Total	998	100	664	100	3 249	100

Source: 1993-94 Monash data base.

Whilst applying the parent industry's cost structure on disaggregated industries is plausible when the outputs of the disaggregated industries are similar, this is not the case for the Other Food Products industry. The production processes (and hence the intermediate inputs required for producing Sugar, Seafood and Other Food Products[3]) are quite distinct. For example, it is unlikely that Meat products represents the same proportion of costs for the Sugar industry as it does for the Other Food Products industry. Because detailed information on the nature of the inputs purchased by the Sugar, Seafood and Other Food Products was not available, we arbitrarily decided which intermediate inputs were purchased by the three industries. Sales of intermediate inputs to these industries were adjusted as follows:

— The only food input[4] used by the Sugar industry was sugar cane;
— The only food input used by the Seafood industry was fishing;
— All food inputs used by the Sugar and Seafood industries were allocated to the Other Food Products industry; and
— Usage by the Sugar, Seafood and Other Food Products industries of non-food inputs was adjusted to keep their total usage of intermediate inputs in each industry constant.

[2] The three industries are Sugar, Seafood and the residual Other food products.

[3] Mostly pet foods.

[4] By food inputs, we mean commodities produced by the agricultural and food, beverages and tobacco industries.

Table 11.B.3 presents the data from table 11.B.2 after these adjustments were made.

Table 11.B.3 Adjusted Selected Domestic Intermediate Usage in the Sugar, Seafood and Other Food Products Industries

Intermediate Input	Sugar		Seafood		Other Food Products	
	$ Million	Percent of Usage	$ Million	Percent of Usage	$ Million	Percent of Usage
Barley	0	0	0	0	52	2
Sugar cane	932	93	0	0	0	0
Fishing	0	0	161	24	0	0
Meat products	0	0	0	0	277	8
Total food inputs	932	93	161	24	1801	55
Total non-food	66	7	504	76	1448	45
Total	998	100	664	100	3 249	100

Source: Commission estimates

The second adjustment to data base B was to the commodity by industry tax rates on intermediate usage. An examination of these tax rates in the Monash model suggested that there were some errors for certain commodities used by certain industries (table 11.B.4). In addition, the tax rates on usage of domestic and imported inputs were not uniform for sales to a given industry.

Table 11.B.4 Selected Intermediate Usage Tax Rates from the Monash Model

Intermediate Input	Tax Rate (percent)		Used by Industry
	Domestic	Imported	
Wine and spirits	650	650	Poultry
Wine and spirits	214	214	Railway equipment
Leather products	284	284	Agricultural services
Insurance	0.2	252	Other wood products
Insurance	0.01	245	Publishing
Insurance	0.6	162	Plastic products

Rather than adjust the tax rates on an *ad hoc* basis, the intermediate usage tax rates from the 1992-93 ORANI model were used. This eliminated both the unreasonably large tax rates levied on commodities used by some industries and ensured that the tax rates on both domestic and imported commodities were uniform (table 11.B.5). Note that the other costs item was adjusted for each industry to ensure that the new data base remained balanced.

Table 11.B.5 Adjusted Selected Domestic Intermediate Usage Tax Rates

Intermediate Input	Tax Rate (percent)		Used by Industry
	Domestic	Imported	
Wine and spirits	149	149	Poultry
Wine and spirits	130	130	Railway equipment
Leather products	46	46	Agricultural services
Insurance	9	9	Other wood products
Insurance	17	17	Publishing
Insurance	12	12	Plastic products

11.B.3. Disaggregating the Data Base

As a result of the above modifications, we have a 122 commodity by 122 industry data base (data base C in figure 11.B.1). As GTAP version 5 has 57 commodities and 57 industries, a concordance between Monash and GTAP was required. This concordance also identified whether data base C needed to be disaggregated[5].

Because of changes to both the source of the original I-O information and the GTAP classification, it was not possible to use the concordance developed in the previous data base update (Mastoris and Travis, 1997). Instead, we constructed a new concordance between Monash and the GTAP classification (table 11.B.A2). This concordance was constructed using:

— the concordance between ISIC and GSC2 (table 11.B.A3);

— and the concordance between the Central Product Classification (*CPC*) and GSC2 which was used for agricultural and food products (table 11.B.A4).

There is a relatively straightforward concordance between Monash and GTAP, with six Monash commodities and industries requiring disaggregation (table 11.B.6).

Table 11.B.6 Monash Commodities and Industries that Require Disaggregation

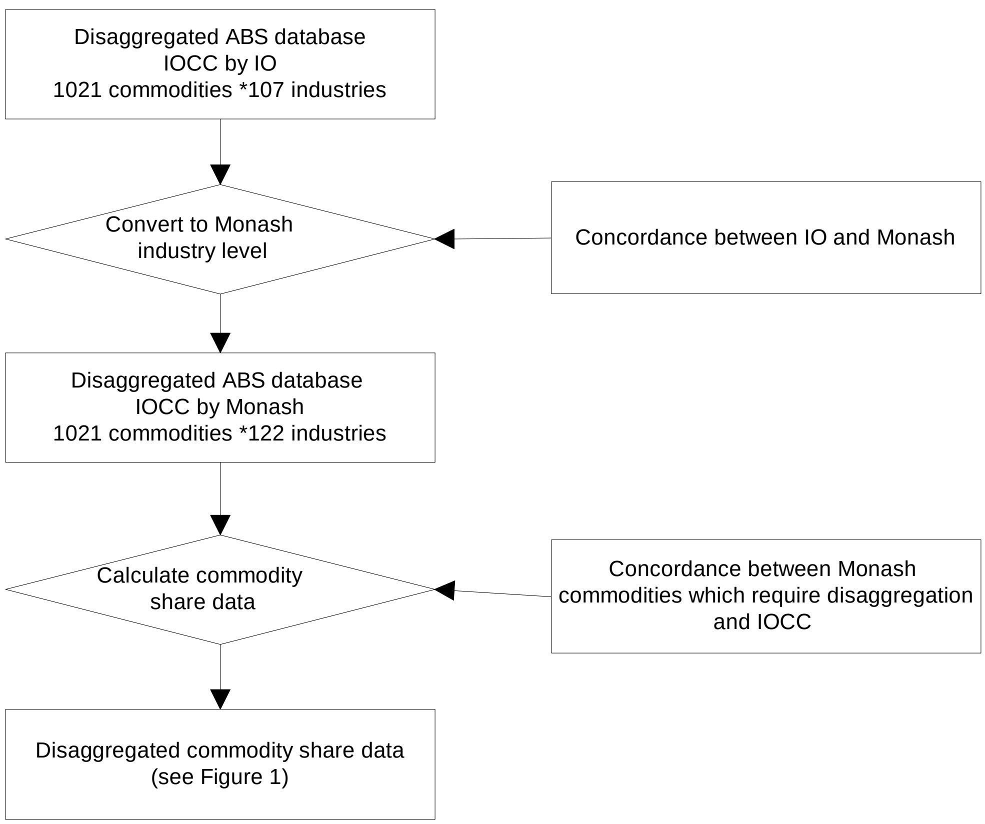
Other grains	Other agriculture
Agricultural services	Meat products
Flour and cereal products	Other food products

To assist in disaggregating these six commodities and industries, we used unpublished commodity card information from the Australian Bureau of Statistics (*ABS).* These commodity cards provide information at the IOCC level, the next level below the Monash classification, on the sales

[5] Disaggregation of the data base is required where a Monash commodity (industry) is an aggregate of two or more GTAP commodities (industries).

disposition of 1,021 commodities and provided the starting point for creating the commodity share data (figure 11.B.2).

Figure 11.B.2 Process for Creating Commodity Share Data



In order to make the commodity card data useable, we needed to convert it so it had the same industry structure as data base C, i.e. the Monash industry level. The commodity card data specified sales to 107 industries (I-O level) and fortunately, there was a 1:1 correspondence between the I-O level and the Monash level for all but six of the I-O industries. Details of these six I-O industries and their concordance with Monash is presented in table 11.B.7.

Table 11.B.7 Concordance Between I-O and Monash

I-O Industry	Monash Industry	Allocation (percent)
Sheep	Wool	76.7
	Sheepmeat	23.3
	Total	100.0
Grains	Wheat	50.9
	Barley	20.5
	Other grains	28.6
	Total	100.0
Other agriculture	Sugar cane	15.2
	Raw cotton	10.4
	Grapes	5.7
	Hay and fodder	9.2
	Other agriculture	59.5
	Total	100.0
Foresting and logging	Forestry Services	24.5
	Logging	75.5
	Total	100.0
Coal, oil, and gas	Coking coal	23.4
	Thermal coal	24.5
	Crude oil	32.0
	Natural gas	5.4
	Liquid gas	14.7
	Total	100.0
Other food products	Sugar	22.1
	Seafood	13.5
	Other food products	64.4
	Total	100.0

Source: ABS 1997a.

The table indicates the composition of the six I-O industries in terms of the Monash classification. For example, I-O industry Sheep is comprised of Monash industry Wool and Monash industry Sheepmeat in the ratio 76.7:23.3. Thus in the new IOCC by Monash data base, 76.7 percent of the inputs used by the I-O Sheep industry were allocated to the Monash Wool industry with the remainder going to the Monash Sheepmeat industry.

There were a few of exceptions made to the above rule, namely:

— sales of sheep shearing services to the Sheep industry were allocated solely to the new Wool industry;

— intra-industry usage of the six I-O industries were allocated to the Monash industry of the same name. For example, sales of wheat to the Grains industry were allocated solely to the new Wheat industry, sales of grapes to the Other Agriculture industry were allocated solely to the new Grapes industry and so on.

This IOCC by Monash data base was the starting point for disaggregating the commodity side of the data base.

11.B.4 Disaggregating the Commodity Side of the Data Base

Table 11.B.A5 details the 88 IOCCs which comprise the six Monash commodities to be disaggregated[6]. This concordance and the IOCC by Monash data base were used to calculate the commodity share data.

The standard approach to disaggregate commodity or industry data was followed in Mastoris and Travis (1997):

> *"Each commodity's Australian production was expressed as a share of the total Australian production of the commodity group to which it belonged. These shares were then used to split the commodity. The method assumed that in the production of that commodity, each industry used the same production technology." (Mastoris and Travis, 1997).*

The disadvantage with this methodology is that the sales (cost) structure of the disaggregated commodity (industry) takes on the same pattern as the group from which it was split.

By contrast, we had detailed information for all the components of the six Monash commodities that required disaggregation from the IOCC by Monash data base. This included information on sales to intermediate usage by industry, exports, household consumption, investment, sales to government and changes in stocks. This information was used to create commodity share data that was *specific* to each type of usage to disaggregate data base C[7]. That is, rather than calculating the share of sales that each IOCC comprises in its Monash commodity and allocating that share across all sales categories, we instead calculate the share of each IOCC in its Monash commodity grouping for *each* type of sales category, including sales to each industry.

Table 11.B.8 shows how this methodology preserved the diversity of the sales pattern from the commodity cards. The table presents sales of the IOCCs within the Monash commodity Services to Agriculture to two selected industries, Wool and Woven fibres. The data in the table indicates that whereas there was no cotton (ginned or seed) sold to the Wool industry, the only Services to Agriculture input used by the Woven fibres industry is cotton. This diversity in the use of the IOCCs which comprise the Services to Agriculture commodity would not be captured if the industry-average shares (last column of table 11.B.8) were used to allocate the sales of IOCCs.

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[6] This table also details the concordance between the IOCCs and GTAP.

[7] Note that the share data are also specific across sales to each industry.

Table 11.B.8 Selected Commodity Shares for Monash Commodity Services to Agriculture

	Sales to Wool		Sales to Woven fibres		Total Sales to all Industries	
Services to Agriculture	Value ($ million)	Share (percent)	Value ($ million)	Share (percent)	Value ($ million)	Share (percent)
Cotton ginned	0.0	0.0	94.26	88.4	108.72	*9.2*
Cotton seed	0.0	0.0	12.33	11.6	61.34	*5.2*
Sheep shearing services	102.86	87	0	0.0	103.06	8.7
Aerial agricultural services	1.45	1.2	0	0	36.05	3.1
Services to agriculture n.e.c.	13.92	11.7	0	0	771.16	65.3
Skins and pieces raw	0	0	0	0	100.42	8.5
Total	118.23	100	106.59	100	1180.75	100

Note: Shares may not sum due to rounding.

This same exercise was repeated for sales of the 88 IOCC commodities to all other Monash industries and all components of final demand. Note that where there was no information from the commodity cards regarding sales of any of the IOCCs which comprised a particular Monash commodity to an industry, default shares of total sales to intermediate usage for each IOCC were used. For the components of final demand, aggregate sales across all final demand categories (excluding changes in stocks) were used to calculate default shares where sales of an individual final demand category from the commodity cards were missing.

Using these commodity shares, we then disaggregate the commodities in the Monash data base. During this process, the size of the input-output table expanded from 122 commodities and 122 industries to 204 commodities and 122 industries (data base D in figure 11.B.1[8]).

11.B.5 Disaggregating the Industry Side and Aggregating to GTAP

Next the industries within data base D were expanded to create a 204 commodity by 204 industry data base (data base E).

Because the commodity card information contains disaggregated data for commodities but not for industries, the methodology used to disaggregate the six Monash industries follows a line similar to that in Mastoris and Travis (1997) with one significant difference. Rather than relying only on output shares to expand a disaggregated industry, judgement was exercised to determine whether the new industry used a particular intermediate input. That is, we specified either that:

[8] The data base now has (122 original commodities + 88 IOCC commodities – 6 Monash commodities) = 204 commodities

— the disaggregated industries purchased a particular commodity in equal proportions, or
— only one of the new industries purchased the commodities sold to the parent industry.

The main exceptions made to the above rule were:

— The only food input used by the IOCC 21510030 Rice, husked broken or milled industry is IOCC 01210040 Rice in the husk;
— The only Flour and Cereal product industry that uses IOCC 01210040 Rice in the husk is the IOCC 21510030 Rice, husked, broken or milled industry;
— The only food input used by the IOCC 21710020 Refined sugar and IOCC 21710030 Sugar n.e.c. industries is Sugar cane;
— The only Other food products industries that used Sugar cane are IOCC 21710020 Refined sugar and IOCC 21710030 Sugar n.e.c..

Intra-industry usage of the 88 IOCC commodities in data base D by a disaggregated Monash industry were allocated to the relevant new Monash industry. For example, sales of Potatoes to the Other agriculture industry were allocated solely to the new Potatoes industry, sales of Smallgoods to the Meat Products industry were allocated solely to the new Smallgoods industry, and so on. Disaggregating these industries produced data base E.

Finally, data base E was aggregated to the GTAP 57 by 57 level (data base F) using the concordance between the IOCC/Monash and GTAP (table 11.B.A6).

11.B.6 Diagnostics

At four key stages during the process outlined in figure 11.B.1 various diagnostic tests were conducted on the data base including comparing the cost and sales structures of industries before and after key changes to the data base and also checking for negative values for purchasers' prices.

The completed data base was also assessed by a number of GTAP programs written specifically to examine the rigorousness of an input-output data base. These programs check:

— that the total sales for each sector equal total costs;
— the signs of each element in the data base. Except for changes in stocks and taxes, all values should be positive or zero; and
— that the tax rates implied by the data base are not particularly large or ridiculous.

Following these checking procedures, the completed data base was sent to the GTAP Center for inclusion in Version 5 of the GTAP data base.

References

Australian Bureau of Statistics. 1997a. "1993-94 Australian National Accounts: Input-Output Tables, Commodity Details," Cat. No. 5215.0, AGPS, Canberra.

Australian Bureau of Statistics. 1997b. "1993-94 Australian National Accounts: Input-Output Tables," Cat. No. 5209.0, AGPS, Canberra.

Huff, K, McDougall R. and T. Walmsley. 1999. "Contributing Input-Output Tables to the GTAP Data Base," GTAP Technical Paper No. 1, Release 4.1, August.

Mastoris, I. and J. Travis. 1997. "Constructing the 1992-93 Australian data base for GTAP (Release 4)," Productivity Commission Research Memorandum, GT 1, August.

Appendix 1: Concordance Tables

Table 11.B.A1 Monash 1993-94 Commodities

Number	Description	Number	Description
1	Wool	39	Beer and malt
2	Sheep meat	40	Wine and spirits
3	Wheat	41	Tobacco products
4	Barley	42	Textile fibres, yarns etc
5	Other grains	43	Textile products
6	Beef cattle	44	Knitting mill products
7	Dairy cattle	45	Clothing
8	Pigs	46	Footwear
9	Poultry	47	Leather and leather products
10	Sugar cane	48	Sawmill products
11	Raw cotton	49	Other wood products
12	Grapes	50	Pulp, paper and paperboard
13	Hay and fodder	51	Paper containers and products
14	Other agriculture	52	Printing; services to printing
15	Services to agriculture	53	Publishing; recorded media etc
16	Services to forestry	54	Petroleum and coal products
17	Logging	55	Basic chemicals
18	Commercial fishing	56	Paints
19	Coking coal	57	Pharmaceuticals
20	Thermal coal	58	Soap and other detergents
21	Crude oil	59	Cosmetics and toiletries
22	Natural gas	60	Other chemical products
23	Liquid gas	61	Rubber products
24	Iron ores	62	Plastic products
25	Non-ferrous metal ores	63	Glass and glass products
26	Other mining	64	Ceramic products
27	Services to mining	65	Cement and lime
28	Meat and meat products	66	Plaster, other concrete prod.
29	Dairy products	67	Other non-metallic mineral products
30	Fruit and vegetable products	68	Iron and steel
31	Oils and fats	69	Basic non-ferrous metals etc
32	Flour and cereal products	70	Structural metal products
33	Bakery products	71	Sheet metal products
34	Confectionary	72	Fabricated metal products
35	Sugar	73	Motor vehicles and parts etc
36	Seafood products	74	Sips and boats
37	Other food products	75	Railway equipment
38	Soft drinks and syrups	76	Aircraft
77	Scientific etc equipment	100	Services to transport; storage
78	Electronic equipment	101	Communication services

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Table 11.B.A1 Monash 1993-94 Commodities (continued)

Number	Description	Number	Description
79	Household appliances	102	Banking
80	Other electrical equipment	103	Non-bank finance
81	Agricultural, mining etc equipment	104	Financial asset investors
82	Other machinery and equipment	105	Insurance
83	Prefabricated buildings	106	Services to finance etc
84	Furniture	107	Ownership of dwellings
85	Other manufacturing	108	Other property services
86	Electricity	109	Scientific and technical services
87	Gas	110	Legal, accounting etc services
88	Water, sewerage and drainage	111	Other business services
89	Residential building	112	Government administration
90	Other construction	113	Defence
91	Wholesale trade	114	Education
92	Retail trade	115	Health services
93	Mechanical repairs	116	Community services
94	Other repairs	117	Motion picture, radio etc
95	Accommodation, cafes & restaurants	118	Libraries, museums, arts
96	Road transport	119	Sport, gambling & recreational services
97	Rail, pipeline, other transp.	120	Personal services
98	Water transport	121	Other services
99	Air and space transport	122	Non-competing imports

Table 11.B.A2 Concordance between Monash Commodities and GSC2

Monash Commodity Number	Monash Commodity Name	GTAP Commodity Name	GTAP Commodity Number
1	Wool	Wool, silk-worm cocoons	12
2	Sheepmeat	Bovine cattle, sheep and goats, horses	9
3	Wheat	Wheat	2
4	Barley	Cereal grains n.e.c.	3
5	Other grains	Paddy rice	1
		Cereal grains n.e.c.	3
		Oil seeds	5
6	Beef cattle	Bovine cattle, sheep and goats, horses	9
7	Dairy	Raw milk	11
8	Pigs	Animal products n.e.c.	10
9	Poultry	Animal products n.e.c.	10
10	Sugar cane	Sugar cane, sugar beet	6
11	Raw cotton	Plant-based fibres	7
12	Grapes	Vegetables, fruit, nuts	4
13	Hay and fodder	Crops n.e.c.	8
14	Other agriculture	Vegetables, fruit, nuts	4
		Crops n.e.c.	8
		Bovine cattle, sheep and goats, horses	9
		Animal products n.e.c.	10
15	Services to agriculture	Oilseeds	5
		Plant-based fibres	7
		Crops n.e.c.	8
		Animal products n.e.c.	10
		Wool, silk-worm cocoons	12
16	Services to forestry	Forestry	13
17	Logging	Forestry	13
18	Commercial fishing	Fishing	14
19	Coking coal	Coal	15
20	Thermal coal	Coal	15
21	Crude oil	Oil	16
22	Natural gas	Gas	17
23	Liquid gas	Gas	17
24	Iron ores	Gas	18
25	Non-ferrous metal ores	Minerals n.e.c.	18
26	Other mining	Minerals n.e.c.	18
27	Services to mining	Minerals n.e.c.	18
28	Meat and meat products	Bovine cattle, sheep and goat meat products	19
		Meat products n.e.c.	20
29	Dairy products	Dairy products	22
30	Fruit & vegetable products	Food products n.e.c.	25
31	Oils and fats	Vegetable oils and fats	21
32	Flour and cereal products	Processed rice, food products n.e.c.	23
33	Bakery products	Food products n.e.c.	251
34	Confectionary	Food products n.e.c.	25

contd

Table 11.B.A2 Concordance between Monash Commodities and GSC2 (continued)

Monash Commodity Number	Monash Commodity Name	GTAP Commodity Name	GTAP Commodity Number
35	Sugar	Sugar, food products n.e.c.	24
36	Seafood products	Food products n.e.c.	25
37	Other food products	Sugar	24
		Food products n.e.c.	25
38	Soft drinks and syrups	Beverages and tobacco products	26
39	Beer and malt	Beverages and tobacco products	26
40	Wine and spirits	Beverages and tobacco products	26
41	Tobacco products	Beverages and tobacco products	26
42	Textile fibres, yarns etc	Textiles	27
43	Textile products	Textiles	27
44	Knitting mill products	Textiles	27
45	Clothing	Wearing apparel	28
46	Footwear	Leather products	29
47	Leather and leather products	Leather products	29
48	Sawmill products	Wood products	30
49	Other wood products	Wood products	30
50	Pulp, paper and paperboard	Paper products, publishing	31
51	Paper containers & products	Paper products, publishing	31
52	Printing; services to printing	Paper products, publishing	31
53	Publishing; recorded media etc	Paper products, publishing	31
54	Petroleum and coal products	Petroleum, coal products	32
55	Basic chemicals	Chemical, rubber, plastic products	33
56	Paints	Chemical, rubber, plastic products	33
57	Pharmaceuticals	Chemical, rubber, plastic products	33
58	Soap and other detergents	Chemical, rubber, plastic products	33
59	Cosmetics and toiletries	Chemical, rubber, plastic products	33
60	Other chemical products	Chemical, rubber, plastic products	33
61	Rubber products	Chemical, rubber, plastic products	33
62	Plastic products	Chemical, rubber, plastic products	33
63	Glass and glass products	Mineral products n.e.c.	34
64	Ceramic products	Mineral products n.e.c.	34
65	Cement and lime	Mineral products n.e.c.	34
66	Plaster, other concrete prod.	Mineral products n.e.c.	34
67	Other non-metallic mineral products	Mineral products n.e.c.	34
68	Iron and steel	Ferrous metals	35
69	Basic non-ferrous metals etc	Metals n.e.c.	36
70	Structural metal products	Metal products	37
71	Sheet metal products	Metal products	37
72	Fabricated metal products	Metal products	37
73	Motor vehicles and parts etc	Motor vehicles and parts	38
74	Ships and boats	Transport equipment n.e.c.	39
75	Railway equipment	Transport equipment n.e.c.	39
76	Aircraft	Transport equipment n.e.c.	39
77	Scientific etc equipment	Machinery and equipment n.e.c.	41

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Table 11.B.A2 Concordance between Monash Commodities and GSC2 (continued)

Monash Commodity Number	Monash Commodity Name	GTAP Commodity Name	GTAP Commodity Number
78	Electronic equipment	Electronic equipment	40
79	Household appliances	Machinery and equipment n.e.c.	41
80	Other electrical equipment	Machinery and equipment n.e.c.	41
81	Agricultural, mining etc equipment	Machinery and equipment n.e.c.	41
82	Other machinery and equipment	Machinery and equipment n.e.c.	41
83	Prefabricated buildings	Metal products	37
84	Furniture	Wood products	30
85	Other manufacturing	Manufactures n.e.c.	42
86	Electricity	Electricity	43
87	Gas	Gas manufacture, distribution	44
88	Water, sewerage and drainage	Water	45
89	Residential building	Construction	46
90	Other construction	Construction	46
91	Wholesale trade	Trade	47
92	Retail trade	Trade	47
93	Mechanical repairs	Trade	47
94	Other repairs	Trade	47
95	Accommodation, cafes & restaurants	Trade	47
96	Road transport	Transport n.e.c.	48
97	Rail, pipeline, other transport.	Transport n.e.c.	48
98	Water transport	Water transport	49
99	Air and space transport	Air transport	50
100	Services to transport; storage	Transport n.e.c.	48
101	Communication services	Communication	51
102	Banking	Financial services n.e.c.	52
103	Non-bank finance	Financial services n.e.c.	52
104	Financial asset investors	Financial services n.e.c.	52
105	Insurance	Insurance	53
106	Services to finance etc	Financial services n.e.c.	52
107	Ownership of dwellings	Dwellings	57
108	Other property services	Business services n.e.c.	54
109	Scientific and technical services	Business services n.e.c.	54
110	Legal, accounting etc services	Business services n.e.c.	54
111	Other business services	Business services n.e.c.	54
112	Government administration	Public administration and defence, education, health	56
113	Defence	Public administration and defence, education, health	56
114	Education	Public administration and defence, education, health	56
115	Health services	Public administration and defence, education, health	56
116	Community services	Public administration and defence, education, health	56

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Table 11.B.A2 Concordance between Monash Commodities and GSC2 (continued)

Monash Commodity Number	Monash Commodity Name	GTAP Commodity Name	GTAP Commodity Number
117	Motion picture, radio etc	Recreational and other services	55
118	Libraries, museums, arts	Recreational and other services	55
119	Sport, gambling and recreational services	Recreational and other services	55
120	Personal services	Recreational and other services	55
121	Other services	Recreational and other services	55
122	Non-competing imports	Public administration and defence, education, health	56

Table 11.B.A3 Concordance Between ISIC Rev. 3 and GSC2

1	2	3	4
0111	1	1	Growing of paddy rice, not combined with animal farming
0111	2	2	Growing of wheat, not combined with animal farming
0111	3	3	Growing of grains except paddy rice and wheat, not combined with animal farming
0111	4	5	Growing of oil seeds, not combined with animal farming
0111	5	6	Growing of sugar cane and sugar beet, not combined with animal farming
0111	6	7	Growing of plant-based fibres, not combined with animal farming
0111	7	8	Growing of crops n.e.c., not combined with animal farming
0112	1	4	Growing of vegetables, not combined with animal farming
0112	2	8	Growing of horticultural specialities and vegetable products, not combined with animal farming
0113	1	4	Growing of fruit and nuts, not combined with animal farming
0113	2	8	Growing of beverage and spice crops, not combined with animal farming
0121	1	9	Farming of cattle, sheep, goats, horses, asses, mules and hinnies; excluding wool production; not combined with crop growing
0121	2	11	Dairy farming, not combined with crop growing
0121	3	12	Wool production, not combined with crop growing
0122	0	10	Other animal farming; production of animal products n.e.c.; not combined with crop growing
0130	1	1	Growing of paddy rice, combined with animal farming
0130	2	2	Growing of wheat, combined with animal farming
0130	3	3	Growing of grains except paddy rice and wheat, combined with animal farming combined with crop growing
0130	4	4	Growing of vegetables, fruit and nuts, combined with animal farming
0130	5	5	Growing of oil seeds, combined with animal farming
0130	6	6	Growing of sugar cane and sugar beet, combined with animal farming
0130	7	7	Growing of plant-based fibres, combined with animal farming
0130	8	8	Growing of crops n.e.c., combined with animal farming
0130	9	9	Farming of cattle, sheep, goats, horses, asses, mules and hinnies; excluding wool production;

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Table 11.B.A3 Concordance Between ISIC Rev. 3 and GSC2 (continued)

1	2	3	4
0130	10	10	Other animal farming; production of animal products n.e.c. combined with crop growing
0130	11	11	Dairy farming, combined with crop growing
0130	12	12	Wool production, combined with crop growing
0140	1	1	Services to growing of paddy rice
0140	2	2	Services to growing of wheat
0140	3	3	Services to growing of grains except paddy rice and wheat
0140	4	4	Services to growing of vegetables, fruit and nuts
0140	5	5	Services to growing of oil seeds
0140	6	6	Services to growing of sugar cane and sugar beet
0140	7	7	Services to growing of plant-based fibres
0140	8	8	Services to growing of crops n.e.c.
0140	9	9	Services to farming of cattle, sheep, goats, horses, asses, mules and hinnies; excluding wool production; combined with crop growing
0140	10	10	Services to other animal farming; production of animal products n.e.c.; combined with crop growing
0140	11	11	Services to dairy farming
0140	12	12	Services to wool production
0150	0	14	Hunting, trapping and game propagation, including related service activities
0200	0	13	Forestry, logging and related service activities
0500	0	14	Fishing, operation of fish hatcheries and fish farms;
1010	0	15	Mining and agglomeration of hard coal
1020	0	15	Mining and agglomeration of lignite
1030	0	18	Mining and agglomeration of peat
1110	1	16	Extraction of crude petroleum and natural gas
1200	0	18	Mining of uranium and thorium ores
1310	0	18	Mining of iron ores
1200	0	18	Mining of uranium and thorium ores
1310	0	18	Mining of iron ores
1320	0	18	Mining of non-ferrous metal ores, except uranium and thorium ores
1410	0	18	Quarrying of stone, sand and clay
1421	0	18	Mining of chemical and fertiliser minerals
1422	0	18	Extraction of salt
1429	0	18	Other mining and quarrying n.e.c.
1511	1	19	Production, processing and preserving of bovine cattle, sheep and goat, horse meat products
1511	2	20	Production, processing and preserving of meat products n.e.c.
1512	0	25	Processing and preserving of fish and fish products
1513	0	25	Processing and preserving of fruit and vegetables
1514	1	20	Manufacture of animal oils and fats
1514	2	21	Manufacture of vegetable oils and fats
1520	0	22	Manufacture of dairy products
1531	1	23	Rice milling
1531	2	25	Manufacture of grain mill products n.e.c.
1532	0	25	Manufacture of starches and starch products

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Table 11.B.A3 Concordance Between ISIC Rev. 3 and GSC2 (continued)

1	2	3	4
1533	0	25	Manufacture of prepared animal feeds
1541	0	25	Manufacture of bakery products (bread, pastry, etc.)
1542	0	24	Manufacture of sugar
1543	0	25	Manufacture of cocoa, chocolate and sugar confectionery
1544	0	25	Manufacture of macaroni, noodles, couscous and similar products
1549	0	25	Manufacture of other food products n.e.c.
1551	0	26	Distilling, rectifying and blending of spirits; ethyl alcohol production from fermented materials
1552	0	26	Manufacture of wines
1553	0	26	Manufacture of malt liquors and malt
1554	0	26	Manufacture of soft drinks; production of mineral waters
1600	0	26	Manufacture of tobacco products
1711	0	27	Preparation and spinning of textile fibres; weaving of textiles
1712	0	27	Finishing of textiles
1721	0	27	Manufacture of made-up textile articles, except apparel
1722	0	27	Manufacture of carpets and rugs
1723	0	27	Manufacture of cordage, rope, twine and netting
1729	0	27	Manufacture of other textiles n.e.c.
1730	0	27	Manufacture of knitted and crocheted fabrics and articles
1810	0	28	Manufacture of wearing apparel, except fur apparel
1820	0	28	Dressing and dying of fur; manufacture of articles of fur
1911	0	29	Tanning and dressing of leather
1912	0	29	Manufacture of luggage, handbags and the like, saddlery and harness
1920	0	29	Manufacture of footwear
2010	0	30	Sawmilling and planing of wood
2021	0	30	Manufacture of veneer sheets; manufacture of plywood, laminboard, particle board and other panels and boards
2022	0	30	Manufacture of builders' carpentry and joinery
2023	0	30	Manufacture of wooden containers
2029	0	30	Manufacture of other products of wood; manufacture of articles of cork, straw and plaiting materials
2101	0	31	Manufacture of pulp, paper and paperboard
2102	0	31	Manufacture of corrugated paper and paperboard and of containers of paper and paperboard
2109	0	31	Manufacture of other articles of paper and paperboard
2211	0	31	Publishing of books, brochures, musical books and other publications
2212	0	31	Publishing of newspapers, journals and periodicals
2213	0	41	Publishing of recorded media
2219	0	31	Other publishing (photos, engravings, postcards, timetables, forms, posters
2221	0	31	Printing (periodicals, books, maps, music, posters, catalogues, stamps, currency) on account of publishers, producers, government, others
2222	0	31	Service activities related to printing (bookbinding, production of type plates)
2230	0	41	Reproduction of recorded media
2310	0	32	Manufacture of coke oven products
2320	0	32	Manufacture of refined petroleum products

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Table 11.B.A3 Concordance Between ISIC Rev. 3 and GSC2 (continued)

1	2	3	4
2330	0	33	Processing of nuclear fuel
2411	0	33	Manufacture of basic chemicals, except fertilisers and nitrogen compounds
2412	0	33	Manufacture of fertilisers and nitrogen compounds
2413	0	33	Manufacture of plastics in primary forms and synthetic rubber
2421	0	33	Manufacture of pesticides and other agro-chemical products
2422	0	33	Manufacture of paints, varnishes and similar coatings, printing ink and mastics
2423	0	33	Manufacture of pharmaceuticals, medicinal chemicals and botanical products
2424	0	33	Manufacture of soap and detergents, cleaning and polishing preparations, perfumes and toilet preparations
2429	0	33	Manufacture of other chemical products n.e.c.
2430	0	27	Manufacture of man-made fibres
2511	0	33	Manufacture of rubber tyres and tubes; retreading/rebuilding of tyres
2519	0	33	Manufacture of other rubber products
2520	0	33	Manufacture of plastics products
2610	0	34	Manufacture of glass and glass products
2691	0	34	Manufacture of non-structural non-refractory ceramic ware (pottery, china and earthenware)
2692	0	34	Manufacture of refractory ceramic products
2693	0	34	Manufacture of structural non-refractory clay and ceramic products
2694	0	34	Manufacture of cement, lime and plaster
2695	0	34	Manufacture of articles of concrete, cement and plaster
2696	0	34	Cutting, shaping and finishing of stone (not at quarry)
2699	0	34	Manufacture of other non-metallic mineral products n.e.c.
2710	0	35	Manufacture of basic iron and steel
2720	0	36	Manufacture of basic precious and non-ferrous metals
2731	0	35	Casting of iron and steel
2732	0	36	Casting of non-ferrous metals
2811	0	37	Manufacture of structural metal products
2812	0	37	Manufacture of tanks, reservoirs and containers of metal
2813	0	37	Manufacture of steam generators, except central heating hot water boilers
2891	0	37	Forging, pressing, stamping and roll-forming of metal; powder metallurgy
2892	0	37	Treatment and coating of metals; general mechanical engineering on a fee or contract basis
2893	0	37	Manufacture of cutlery, hand tools and general hardware
2899	0	37	Manufacture of other fabricated metal products n.e.c.
2911	0	41	Manufacture of engines and turbines, except aircraft, vehicle and cycle engines
2912	0	41	Manufacture of pumps, compressors, taps and valves
2913	0	41	Manufacture of bearings, gears, gearing and driving elements
2914	0	41	Manufacture of ovens, furnaces and furnace burners
2915	0	41	Manufacture of lifting and handling equipment
2919	0	41	Manufacture of other general purpose machinery
2921	0	41	Manufacture of agricultural and forestry machinery
2922	0	41	Manufacture of machine-tools
2923	0	41	Manufacture of machinery for metallurgy
2924	0	41	Manufacture of machinery for mining, quarrying and construction

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Table 11.B.A3 Concordance Between ISIC Rev. 3 and GSC2 (continued)

1	2	3	4
2925	0	41	Manufacture of machinery for food, beverage and tobacco processing
2926	0	41	Manufacture of machinery for textile, apparel and leather production
2927	0	41	Manufacture of weapons and ammunition
2929	0	41	Manufacture of other special purpose machinery
2930	0	41	Manufacture of domestic appliances n.e.c.
3000	0	40	Manufacture of office, accounting and computing machinery
3110	0	41	Manufacture of electric motors, generators and transformers
3120	0	41	Manufacture of electricity distribution and control apparatus
3130	0	41	Manufacture of insulated wire and cable
3140	0	41	Manufacture of accumulators, primary cells and primary batteries
3150	0	41	Manufacture of lighting equipment and electric lamps
3190	0	41	Manufacture of other electrical equipment n.e.c.
3210	0	40	Manufacture of electronic valves and tubes and other electronic components
3220	0	40	Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy
3230	0	40	Manufacture of television and radio receivers, sound or video recording or reproducing apparatus, and associated goods
3311	0	41	Manufacture of medical and surgical equipment and orthopaedic appliances
3312	0	41	Manufacture of instruments and appliances for measuring, checking, testing, navigating and other purposes, except industrial process control equipment
3313	0	41	Manufacture of industrial process control equipment
3320	0	41	Manufacture of optical instruments and photographic equipment
3330	0	41	Manufacture of watches and clocks
3410	0	38	Manufacture of motor vehicles
3420	0	38	Manufacture of bodies (coachwork) for motor vehicles; manufacture of trailers and semi-trailers
3430	0	38	Manufacture of parts and accessories for motor vehicles and their engines
3511	0	39	Building and repairing of ships
3512	0	39	Building and repairing of pleasure and sporting boats
3520	0	39	Manufacture of railway and tramway locomotives and rolling stock
3530	0	39	Manufacture of aircraft and spacecraft
3591	0	39	Manufacture of motorcycles
3592	0	39	Manufacture of bicycles and invalid carriages
3599	0	39	Manufacture of other transport equipment n.e.c.
3610	0	30	Manufacture of furniture
3691	0	42	Manufacture of jewellery and related articles
3692	0	42	Manufacture of musical instruments
3693	0	42	Manufacture of sports goods
3694	0	42	Manufacture of games and toys
3699	0	42	Other manufacturing n.e.c.
3710	0	47	Recycling of metal waste and scrap
3720	0	47	Recycling of non-metal waste and scrap
4010	0	43	Production, collection and distribution of electricity
4020	0	44	Manufacture of gas; distribution of gaseous fuels through mains
4030	0	44	Steam and hot water supply

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Table 11.B.A3 Concordance Between ISIC Rev. 3 and GSC2 (continued)

1	2	3	4
4100	0	45	Collection, purification and distribution of water
4510	0	46	Site preparation (construction)
4520	0	46	Building of complete constructions or parts thereof; civil engineering
4530	0	46	Building installation
4540	0	46	Building completion
4550	0	46	Renting of construction or demolition equipment with operator
5010	0	47	Sale of motor vehicles
5020	0	47	Maintenance and repair of motor vehicles
5030	0	47	Sale of motor vehicle parts and accessories
5040	0	47	Sale, maintenance and repair of motorcycles and related parts
5050	0	47	Retail sale of automotive fuel
5110	0	47	Wholesale on a fee or contract basis
5121	0	47	Wholesale of agricultural raw materials and live animals
5122	0	47	Wholesale of food, beverages and tobacco
5131	0	47	Wholesale of textiles, clothing and footwear
5139	0	47	Wholesale of other household goods
5141	0	47	Wholesale of solid, liquid and gaseous fuels and related products
5142	0	47	Wholesale of metals and metal ores
5143	0	47	Wholesale of construction materials, hardware, plumbing and heating equipment and supplies
5149	0	47	Wholesale of other intermediate products, waste and scrap
5150	0	47	Wholesale of machinery, equipment and supplies
5190	0	47	Other wholesale
5211	0	47	Retail sale in non-specialised stores with food, beverages or tobacco
5219	0	47	Other retail sale in non-specialised stores
5220	0	47	Retail sale of food, beverages or tobacco in specialised stores
5231	0	47	Retail sale of pharmaceutical and medical goods, cosmetic and toiletries
5232	0	47	Retail sale of textiles, clothing, footwear and leather goods
5233	0	47	Retail sale of household appliances, articles and equipment
5234	0	47	Retail sale of hardware, paints and glass
5239	0	47	Other retail sale in specialised stores
5240	0	47	Retail sale of second-hand goods in stores
5251	0	47	Retail sale via mail order houses
5252	0	47	Retail sale via stalls and markets
5259	0	47	Other non-store retail sale
5260	0	48	Repair of personal and household goods
5510	0	47	Hotels; camping sites and other provision of short-stay accommodation
5520	0	47	Restaurants, bars and canteens
6010	0	48	Transport via railways
6021	0	48	Other scheduled passenger land transport
6022	0	48	Other non-scheduled passenger land transport
6023	0	48	Freight transport by road
6030	0	48	Transport via pipelines
6110	0	49	Sea and coastal water transport
6120	0	49	Inland water transport

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Table 11.B.A3 Concordance Between ISIC Rev. 3 and GSC2 (continued)

1	2	3	4
6210	0	50	Scheduled air transport
6220	0	50	Non-scheduled air transport
6301	0	48	Cargo handling
6302	0	48	Storage and warehousing
6303	0	48	Other supporting transport activities
6304	0	48	Activities of travel agencies and tour operators; tourist assistance activities
6309	0	48	Activities of other transport agencies
6411	0	51	National post activities
6412	0	51	Courier activities other than national post activities
6420	0	51	Telecommunications
6511	0	52	Central banking
6519	0	52	Other monetary intermediation
6591	0	52	Financial leasing
6592	0	52	Other credit granting
6599	0	52	Other financial intermediation n.e.c.
6601	0	53	Life insurance
6602	0	53	Pension funding
6603	0	53	Non-life insurance
6711	0	52	Administration of financial markets
6712	0	52	Security dealing activities
6719	0	52	Activities auxiliary to financial intermediation n.e.c.
6720	0	52	Activities auxiliary to insurance and pension funding
7010	0	54	Real estate activities with own or leased property
7020	0	54	Real estate activities on a fee or contract basis
7111	0	54	Renting of land transport equipment (without operator)
7112	0	54	Renting of water transport equipment (without operator)
7113	0	54	Renting of air transport equipment (without operator)
7121	0	54	Renting of agricultural machinery and equipment
7122	0	54	Renting of construction and civil engineering machinery and equipment
7123	0	54	Renting of office machinery and equipment (including computers)
7129	0	54	Renting of other machinery and equipment n.e.c.
7130	0	54	Renting of personal and household goods n.e.c.
7210	0	54	Hardware consultancy
7220	0	54	Software consultancy and supply
7230	0	54	Data processing
7240	0	54	Data base activities
7250	0	54	Maintenance and repair of office, accounting and computing machinery
7290	0	54	Other computer related activities
7310	0	54	Research and experimental development on natural sciences and engineering (NSE)
7320	0	54	Research and experimental development on social sciences and humanities
7411	0	54	Legal activities
7412	0	54	Accounting, bookkeeping and auditing activities; tax consultancy
7413	0	54	Market research and public opinion polling
7414	0	54	Business and management consultancy activities

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Table 11.B.A3 Concordance Between ISIC Rev. 3 and GSC2 (continued)

1	2	3	4
7421	0	54	Architectural and engineering activities and related technical consultancy
7422	0	54	Technical testing and analysis
7430	0	54	Advertising
7491	0	54	Labour recruitment and provision of personnel
7492	0	54	Investigation and security activities
7493	0	54	Building-cleaning activities
7494	0	54	Photographic activities
7495	0	54	Packaging activities
7499	0	54	Other business activities n.e.c.
7511	0	56	General (overall) public service activities
7512	0	56	Regulation of the activities of agencies that provide health care, education, cultural services and other social services, excluding social security
7513	0	56	Regulation of and contribution to more efficient operation of business
7514	0	56	Ancillary service activities for the Government as a whole
7521	0	56	Foreign affairs
7522	0	56	Defence activities
7523	0	56	Public order and safety activities
7530	0	56	Compulsory social security activities
8010	0	56	Primary education
8021	0	56	General secondary education
8022	0	56	Technical and vocational secondary education
8030	0	56	Higher education
8090	0	56	Adult and other education
8511	0	56	Hospital activities
8512	0	56	Medical and dental practice activities
8519	0	56	Other human health activities
8520	0	56	Veterinary activities
8531	0	56	Social work with accommodation
8532	0	56	Social work without accommodation
9000	0	56	Sewage and refuse disposal, sanitation and similar activities
9111	0	56	Activities of business and employers' organisations
9112	0	56	Activities of professional organisations
9120	0	56	Activities of trade unions
9191	0	56	Activities of religious organisations
9192	0	56	Activities of political organisations
9199	0	56	Activities of other membership organisations n.e.c.
9211	0	55	Motion picture and video production and distribution
9212	0	55	Motion picture projection
9213	0	55	Production of radio and television programs, whether or not combined with broadcasting
9214	0	55	Dramatic arts, music and other arts activities
9219	0	55	Other entertainment activities n.e.c.
9220	0	55	News agency activities
9231	0	55	Library and archives activities
9232	0	55	Museums activities and preservation of historical sites and buildings

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Table 11.B.A3 Concordance Between ISIC Rev. 3 and GSC2 (continued)

1	2	3	4
9233	0	55	Botanical and zoological gardens and nature reserves activities
9241	0	55	Sporting activities
9249	0	55	Other recreational activities
9301	0	55	Washing and (dry-) cleaning of textile and fur products
9302	0	55	Hairdressing and other beauty treatment
9303	0	55	Funeral and related activities
9309	0	55	Other personal service activities n.e.c.
9500	0	55	Private households with employed persons
9900	0	56	Extra-territorial organisations and bodies

Source: Based on Huff, McDougall and Walmsley (1999).
Each record in the concordance contains four fields:
(1) four digit ISIC code (ISIC class)
(2) if ISIC class maps to multiple GSC sectors, fifth digit to subclassify ISIC class; otherwise, "0"
(3) GSC sector number
(4) description of ISIC class or ad-hoc subclass
For further information on the ISIC, see United Nations 1990, "International Standard Industrial Classification of All Economic Activities, Third Revision", Statistical Paper Series M No. 4, Rev. 3, Sales No. E.91.XVII.7.

Table 11.B.A4 Concordance Between CPC and GSC2 for Agricultural and Food Products

1	2	3	4
0111	0	2	Wheat and meslin
0112	0	3	Maize (corn)
0113	0	1	Rice, not husked
0114	0	1	Husked rice
0115	0	3	Barley
0116	0	3	Rye, oats
0119	0	3	Other cereals
0121	0	4	Potatoes
0122	0	4	Dried leguminous vegetables, shelled
0123	0	4	Other vegetables, fresh or chilled
0124	0	4	Edible roots and tubers with high starch or inulin content
0131	0	4	Dates, figs, bananas, coconuts, brazil nuts, cashew nuts, pineapples, avocados, mangos, guavas, mangosteens, fresh or dried
0132	0	4	Citrus fruit, fresh or dried
0133	0	4	Grapes, fresh or dried
0134	0	4	Other fruit, fresh
0135	0	4	Other fruit, dried
0136	0	4	Other nuts, fresh or dried, whether or not shelled
0141	0	5	Soya beans
0142	0	5	Ground nuts
0143	0	5	Sunflower, sesamum, safflower, rape, colza and mustard seeds
0144	0	5	Cotton seeds
0149	0	5	Oil seeds n.e.c. and oleaginous fruit
0151	0	8	Live plants; bulbs, tubers and roots; cuttings and slips; mushroom spawn
0152	0	8	Cut flowers and flower buds including bouquets, wreaths, floral baskets
0153	0	8	Flower seeds and fruit seeds
0154	0	8	Vegetable seeds
0161	0	8	Beverage crops
0162	0	8	Spices, whether or not processed
0170	0	8	Unmanufactured tobacco
0181	0	6	Sugar beet
0182	0	6	Sugar cane
0191	0	8	Cereal straw and husks, unprepared, whether or not chopped, ground, pressed or in the form of pellets; swedes, mangolds, fodder roots, hay, lucerne (alfalfa), clover, sainfoin, forage kale, lupins, vetches and similar forage products, whether or not in the form of pellets
0192	0	7	Raw vegetable materials used in textiles: cotton, jute and other textile bast fibres, flax and true hemp
0193	0	8	Plants and parts of plants used primarily in perfumery, in pharmacy, or for insecticidal, fungicidal or similar purposes
0194	0	8	Sugar beet seed and seeds of forage plants
0199	0	8	Other raw vegetable materials
0211	0	9	Bovine cattle, sheep and goats, horses, asses, mules, and hinnies, live
0212	0	10	Swine, poultry and other animals, live
0291	0	11	Raw milk

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Table 11.B.A4 Concordance Between CPC and GSC2 for Agricultural and Food Products (continued)

1	2	3	4
0292	0	10	Eggs, in shell, fresh, preserved or cooked
0293	0	10	Natural honey
0294	0	10	Snails, live, fresh, chilled, frozen, dried, salted or in brine, except sea snails; frogs' legs, fresh, chilled or frozen
0295	0	10	Edible products of animal origin n.e.c.
0296	0	12	Raw animal materials used in textile
0297	0	10	Hides, skins and furskins, raw
0298	0	10	Insect waxes and spermaceti, whether or not refined or coloured
0299	0	9	Bovine semen
2111	1	19	Meat of bovine animals, fresh or chilled
2111	2	19	Meat of bovine animals, frozen
2111	3	20	Meat of swine, fresh or chilled
2111	4	20	Meat of swine, frozen
2111	5	19	Meat of sheep, fresh or chilled
2111	6	19	Meat of sheep, frozen
2111	7	19	Meat of goats, fresh, chilled or frozen
2111	8	19	Meat of horses, asses, mules or hinnies, fresh, chilled or frozen
2111	9	19	Edible offal of bovine animals, swine, sheep, goats, horses, asses, mules or hinnies, fresh, chilled or frozen
2112	0	20	Meat and edible offal, fresh, chilled or frozen, n.e.c.
2113	0	20	Preserves and preparations of meat, meat offal or blood
2114	0	20	Flours, meals and pellets of meat or meat offal, inedible; greaves
2121	0	25	Fish fillets, other fish meat and fish livers and roes, fresh or chilled
2122	0	25	Fish, fish fillets, other fish meat and fish livers and roes, frozen
2123	0	25	Fish, dried, salted or in brine; smoked fish; edible fish meal
2124	0	25	Fish, otherwise prepared or preserved; caviar
2125	0	25	Crustaceans, frozen; molluscs and other aquatic invertebrates, frozen, dried, salted or in brine
2126	0	25	Crustaceans, molluscs and other aquatic invertebrates, n.e.c.
2129	0	25	Flours, meals and pellets, inedible, and other products, n.e.c., of fish or of crustaceans, molluscs or other aquatic invertebrates; dead fish, crustaceans, molluscs or other aquatic invertebrates unfit for human consumption
2131	0	25	Vegetables (uncooked or cooked by steaming or boiling in water), frozen
2132	0	25	Vegetables provisionally preserved
2139	0	25	Other preserved vegetables (including dried, canned and preserved)
2140	0	25	Fruit juices and vegetable juices
2151	0	25	Fruit and nuts, uncooked or cooked by steaming or boiling in water, frozen
2152	0	25	Jams, fruit jellies and fruit or nut puree and pastes
2153	0	25	Nuts, ground-nuts, etc., roasted, salted or otherwise prepared n.e.c.
2154	0	25	Fruit and nuts provisionally preserved
2155	0	25	Other preserved fruits
2156	0	25	Apricot, peach or plum stones and kernels
2161	0	19	Fats of bovine animals, sheep, goats, pigs and poultry, raw or rendered; wool

contd

Table 11.B.A4 Concordance Between CPC and GSC2 for Agricultural and Food Products (continued)

1	2	3	4
2162	0	20	Animal oils and fats, crude and refined, except fats of bovine animals, sheep, goats, pigs and poultry
2164	0	21	Palm, coconut, palm kernel, babassu and linseed oil, crude
2165	0	21	Soya-bean, ground-nut, olive, sunflower-seed, safflower, cotton-seed, rape, colza and mustard oil and their fractions, refined but not chemically modified; other oils obtained solely from olives and sesame oil, and their fractions, whether or not refined, but not chemically modified
2166	0	21	Maize (corn) oil and its fractions, not chemically modified
2167	0	21	Palm, coconut, palm kernel, babassu and linseed oil and their fractions, refined but not chemically modified; castor, tung and jojoba oil and fixed vegetable fats and oils (except maize oil) and their fractions n.e.c., whether or not refined, but not chemically modified
2168	0	21	Margarine and similar preparations
2169	0	21	Animal or vegetable fats and oils and their fractions, partly or wholly hydrogenated, inter- esterified, re-esterified or elaidinised, whether or not refined, but not prepared
2170	0	21	Cotton linters
2181	0	21	Oil-cake and other solid residues, whether or not ground or in the form of pellets, resulting from the extraction of vegetable fats or oils
2182	0	21	Flours and meals of oil seeds or oleaginous fruits, except those of mustard
2183	0	21	Vegetable waxes, except triglycerides; degras; residues resulting from the treatment of fatty substances or animal or vegetable waxes
2211	0	22	Processed liquid milk
2212	0	22	Cream
2291	0	22	Milk and cream in solid forms
2292	0	22	Milk and cream, concentrated or containing added sugar or other sweetening matter, other than in solid forms
2293	0	22	Yoghurt and other fermented or acidified milk and cream
2294	0	22	Butter and other fats and oils derived from milk
2295	0	22	Cheese and curd
2296	0	22	Casein
2297	0	22	Ice cream and other edible ice
2298	0	22	Lactose and lactose syrup
2299	0	22	Dairy products n.e.c.
2311	0	25	Wheat or meslin flour
2312	0	25	Cereal flours other than of wheat or meslin
2313	0	25	Groats, meal and pellets of wheat
2314	0	25	Cereal groats, meal and pellets n.e.c.
2315	0	25	Other cereal grain products (including corn flakes)
2316	0	23	Rice, semi- or wholly milled
2317	0	25	Other vegetable flours and meals
2318	0	25	Mixes and doughs for the preparation of bakers' wares
2321	0	25	Glucose and glucose syrup; fructose and fructose syrup; invert sugar; sugars and sugar syrups n.e.c.; artificial honey; caramel

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Table 11.B.A4 Concordance Between CPC and GSC2 for Agricultural and Food Products (continued)

1	2	3	4
2322	0	25	Starches; inulin; wheat gluten; dextrins and other modified starches
2323	0	25	Tapioca and substitutes therefore prepared from starch, in the form of flakes, grains, siftings or similar forms
2330	0	25	Preparations used in animal feeding
2341	0	25	Crispbread; rusks, toasted bread and similar toasted products
2342	0	25	Gingerbread and the like; sweet biscuits; waffles and wafers
2343	0	25	Other bread and other bakers' wares
2351	0	24	Raw cane or beet sugar
2352	0	24	Refined cane or beet sugar and chemically pure sucrose, in solid form, not containing added flavouring or colouring matter
2353	0	24	Refined cane or beet sugar, in solid form, containing added flavouring or colouring matter; maple sugar and maple syrup
2354	0	24	Molasses
2361	0	25	Cocoa paste, whether or not defatted
2362	0	25	Cocoa butter, fat and oil
2363	0	25	Cocoa powder, not sweetened
2364	0	25	Cocoa powder, sweetened
2365	0	25	Chocolate and other food preparations containing cocoa (except sweetened cocoa powder), in bulk forms
2366	0	25	Chocolate and other food preparations containing cocoa (except sweetened cocoa powder), n.e.c.
2367	0	25	Sugar confectionery (including white chocolate), not containing cocoa; fruit, nuts, fruit-peel and other parts of plants, preserved by sugar
2371	0	25	Uncooked pasta, not stuffed or otherwise prepared
2372	0	25	Pasta, cooked, stuffed or otherwise prepared; couscous
2391	0	25	Coffee and tea
2399	0	25	Other food products
2411	0	26	Undenatured ethyl alcohol of an alcoholic strength by volume > 80% vol
2412	0	26	Ethyl alcohol and other spirits, denatured, of any strength
2413	0	26	Undenatured ethyl alcohol of an alcoholic strength by volume of less than 80% vol; spirits, liqueurs and other spirituous beverages; compound alcoholic preparations of a kind used for the manufacture of beverages
2421	0	26	Wine of fresh grapes, whether or not flavoured; grape must
2422	0	26	Cider, perry, mead and other fermented beverages, except wine of fresh grapes and beer made from malt
2431	0	26	Beer made from malt
2432	0	26	Malt, whether or not roasted
2441	0	26	Waters (including mineral waters and aerated waters), not sweetened nor flavoured, except natural water; ice and snow
2449	0	26	Other non-alcoholic beverages
2501	0	26	Cigars, cheroots, cigarillos and cigarettes of tobacco or tobacco substitutes
2509	0	26	Other manufactured tobacco and manufactured tobacco substitutes; "homogenised" or "reconstituted" tobacco; tobacco extracts and essences

Note: Each record in the concordance contains four fields:
(1) first four digits of CPC code (CPC class)
(2) if CPC class maps to multiple GSC sectors, fifth digit of CPC code; otherwise, "0"
(3) GSC sector number
(4) description of CPC class or subclass

Table 11.B.A5 Concordance Between the 6 Monash Commodities that are Disaggregated, the IOCC Commodities they Comprise and GTAP Commodities

Monash Commodity Number	Monash Commodity Name	IOCC Number	IOCC Name	GTAP Commodity Name	GTAP Commodity Number
5	Other grains	01210030	Oats, unmilled	Cereal grains n.e.c.	3
		01210040	Rice in the husk	Paddy rice	1
		01210050	Grain, sorghum	Cereal grains n.e.c.	3
		01210060	Oilseeds	Oil seeds	5
		01210070	Legumes for grain: forage products	Cereal grains n.e.c.	3
		01210080	Cereal grains n.e.c.	Cereal grains n.e.c.	3
14	Other agriculture	01110010	Plant nurseries	Crops n.e.c.	8
		01120010	Cut flower and flower seeds	Crops n.e.c.	8
		01130010	Potatoes	Vegetables, fruit and nuts	4
		01130020	Beans and peas	Vegetables, fruit and nuts	4
		01130030	Cabbages, brussels sprout, etc	Veges, fruit and nuts	4
		01130040	Carrots	Vegetables, fruit and nuts	4
		01130050	Lettuces	Vegetables, fruit and nuts	4
		01130060	Onions	Vegetables, fruit and nuts	4
		01130070	Tomatoes	Vegetables, fruit and nuts	4
		01130080	Vegetables n.e.c.	Vegetables, fruit and nuts	4
		01140030	Currants, raisins etc.	Vegetables, fruit and nuts	4
		01150010	Apples	Vegetables, fruit and nuts	4
		01150020	Pears and quinces	Vegetables, fruit and nuts	4
		01160010	Stone fruit	Vegetables, fruit and nuts	4
		01170010	Kiwi fruit	Vegetables, fruit and nuts	4
		01190010	Bananas	Vegetables, fruit and nuts	4
		01190020	Pineapples	Vegetables, fruit and nuts	4
		01190030	Plantation fruit n.e.c.	Vegetables, fruit and nuts	4
		01190040	Citrus fruit	Vegetables, fruit and nuts	4
		01190050	Edible nuts	Vegetables, fruit and nuts	4
		01190060	Strawberries	Vegetables, fruit and nuts	4
		01190070	Berries, orchard fruit and small fruit n.e.c.	Vegetables, fruit and nuts	
		01520010	Horse studs	Bovine cattle, sheep and goats, horses	9
		01530010	Deer farming	Animal products n.e.c.	10
		01590010	Honey	Animal products n.e.c.	10
		01590020	Pet breeding and live animals	Animal products n.e.c.	10
		01690010	Mushrooms	Vegetables, fruit and nuts	4
		01690020	Tobacco	Crops n.e.c.	8
		01690030	Hops	Crops n.e.c.	8
		01690040	Grass, lucerne and clover seed	Crops n.e.c.	8
		01690060	Agriculture n.e.c.	Crops n.e.c.	8

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Table 11.B.A5 Concordance Between the 6 Monash Commodities that are Disaggregated, the IOCC Commodities they Comprise and GTAP Commodities (continued)

Monash Commodity Number	Monash Commodity Name	IOCC Number	IOCC Name	GTAP Commodity Name	GTAP Commodity Number
15	Services to Agriculture	02110010	Cotton ginned	Plant-based fibres	7
		02110020	Cotton seed	Oilseeds	5
		02120010	Sheep shearing services	Wool, silk-worm cocoons	12
		02130010	Aerial agricultural services	Crops n.e.c.	8
		02190010	Services to agriculture n.e.c.	Crops n.e.c.	8
		02200010	Skins and pieces raw	Animal products n.e.c.	10
28	Meat and meat prod.	21110010	Fresh meat	Bovine cattle, sheep and goat meat products	19
		21110020	Casings, bungs, weasands and runners	Bovine cattle, sheep and goat meat products	19
		21110030	Edible offals	Bovine cattle, sheep and goat meat products	19
		21110040	Edible tallow	Bovine cattle, sheep and goat meat products	
		21110050	Inedible tallow	Bovine cattle, sheep and goat meat products	
		21110060	Raw hides and skins	Bovine cattle, sheep and goat meat products	19
		21110070	Meat for human consumption	Bovine cattle, sheep and goat meat products	19
		21110080	Meal of meat, offal and blood	Meat products n.e.c.	20
		21120010	Poultry, slaughtered	Meat products n.e.c.	20
		21130010	Bacon and ham	Meat products n.e.c.	20
		21130020	Smallgoods	Meat products n.e.c.	20
		21131920	Other income	Meat products n.e.c.	20
32	Flour and cereal prod.	21510010	Wheat flour	Food products n.e.c.	25
		21510020	Wheat bran	Food products n.e.c.	25
		21510030	Flour mill products n.e.c.	Food products n.e.c.	25
		21510040	Starch of wheat and corn	Food products n.e.c.	25
		21510050	Glucose	Food products n.e.c.	25
		21510060	Wheat gluten		
		21520010	Cereal breakfast foods	Food products n.e.c.	25
		21520020	Flour self-raising	Food products n.e.c.	25
		21520030	Prepared baking mixes and doughs	Food products n.e.c.	25 23
		21520040	Rice, husked, broken or milled	Processed rice	25 25
		21520050	Pasta	Food products n.e.c.	
		21521920	Other income	Food products n.e.c.	

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Table 11.B.A5 Concordance Between the 6 Monash Commodities that are Disaggregated, the IOCC Commodities they Comprise and GTAP Commodities (continued)

Monash Commodity Number	Monash Commodity Name	IOCC Number	IOCC Name	GTAP Commodity Name	GTAP Commodity Number
37	Other food products	21710020	Refined sugar	Sugar	24
		21710030	Sugar n.e.c.	Sugar	24
			Dog and cat food (excl canned)	Food products n.e.c.	25
			Dog and cat food, canned	Food products n.e.c.	25
			Prepared animal and bird feeds	Food products n.e.c.	25
			Coffee	Food products n.e.c.	25
			Yeast	Food products n.e.c.	25
			Meat pastes, potato crisps, nuts	Food products n.e.c.	25
			Spices	Food products n.e.c.	25
			Mustard, Worcestershire sauce, etc	Food products n.e.c.	25
			Flavouring essences	Food products n.e.c.	25
			Food products n.e.c.	Food products n.e.c.	25
			Other income	Food products n.e.c.	25