14.2

Australia

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14.2.1 Introduction

This paper outlines the main steps that were taken between January and July 1997 by the Commission to meet its obligations to the GTAP consortium. The current commitment was to provide and update the Australian regional data base.

The Commission purchased ORANI header-array files from the Centre of International Economics (CIE). The data was for the year 1992–93. This purchase minimized the cost and effort of purchasing I/O tables directly from the Australian Bureau of Statistics (ABS). The data base had been ‘zeroed’ for the necessary negatives, but had not been adjusted for ‘typical’ year agricultural production, so that the data reflected actual production for 1992–93.

The agricultural sectors provided by the CIE were not multi product industries as in earlier versions of ORANI. That is, there was no Pastoral Zone, Wheat–Sheep Zone, High Rainfall Zone etc. Instead, agricultural industries followed the I/O classification of single-product industries. Finally, the purchased data was not balanced.

The 1992–93 I/O data base is based on the 1993 Australian New Zealand Standard Industrial Classification (ANZSIC), which comprises a *114x114* I/O table. In contrast, earlier ORANI data bases were based on the Australian Standard Industrial Classification (ASIC), which when purchased from the ABS, were *109x109* I/O tables. This implied a difference in the number and composition of the industries and commodities, particularly below the four-digit level.

A list of the 1992–93 CIE data base and its relation to the ABS I/O classification is given in table 14.2.A1 of the appendix.

The GTAP data base will be the fourth update. The number of industries/commodities in the GTAP sectoral classification has been increased from *33x33* to *50x50*. This classification is now referred to as GSC Rev 1 or GSC1 (see glossary at the front of this document).

14.2.2 Disaggregating the data base

The process of creating an Australian GTAP data base from an existing ORANI data base involved: establishing a concordance between the ORANI header arrays with the GTAP header arrays and -

— estimating the respective domestic/import splits for the margins and commodity taxes;
— establishing a concordance for both commodities and industries between ORANI and GSC1, and
— estimating the respective industry and commodity shares; following the commodity splits, ensuring that for particular commodities the implied sales structures
— accurately reflect the sales structures of the derived commodity;
— splitting labor into ‘high’ and ‘low’ skilled categories; and
— using a suite of software programs to disaggregate and then re-aggregate the ORANI data base.

14.2.2.1 Concording across industries and commodities

Because of the changes to both the ORANI and GTAP classifications, we were unable to apply the earlier concordance that were used in previous data base updates. We had to construct a new concordance between ORANI-92/93 and GSC1. The steps involved in building the new concordance involved:

- concording from ORANI to IOCC. As mentioned earlier, the new I/O classification is based on ANZSIC (1993) and a summary of the concordance is given in table 14.2.A1;
- breaking the IOCC into its component four-digit ANZSICs. This concordance is given in appendix B of ABS (1996a, Cat. No. 5209.0);
- using published ANZSIC-ISIC concordance tables to establish a concordance between ORANI and ISIC, via IOCC and ANZSIC;
- using the concordance between GSC1 and ISIC (given in Huff and McDougall 1996) to establish a concordance between ORANI and GSC1. This also included a concordance between GSC1 and the provisional Central Product Classification (CPC), which was used for agricultural and food products.

The final concordance between GSC1 and IOCC/ANZSIC is given in table 14.2.A2.

14.2.2.2 Calculating industry and commodity shares

Having constructed the industry/commodity concordance tables, the next step was to calculate the industry and commodity shares. The first step in calculating these shares was to identify which four-digit ANZSIC industries/commodities were allocated in part or in full to the various GSC1 groups. For example, according to table 14.2.A2, part of ANZSIC 2722 “Aluminum smelting” (which in turn is part of the 2702 Basic non-ferrous metals and products I/O group) was allocated to GSC1 36 and the other part (a recycling component) to GSC1 47. Similarly, ANZSIC 0111 (of IOCC 0107) was allocated entirely to GSC1 8, whereas part of ANZSIC 0113 was allocated to GSC1 4 and another part to GSC1 8. To successfully split the ANZSIC commodity groups we purchased from the ABS both the industry files and the commodity cards.

14.2.2.3 By commodity

Although the technique for splitting a commodity varies with the availability of data, the following methods were applied to most cases. Splitting data by commodity can involve either a single-step or multiple step process. The main data sources were the ABS’s unpublished commodity cards and the ABS’s published commodity details (ABS 1996b Cat. No. 5215.0).

In the one-step split, 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.

According to the example in table 14.2.1 below, ‘01210030 Oats, unmilled’ production in 1992–93 was $169.1 million, while 0102 Grains was $3869.2 million. This implied that the share of oats 0.0434, or 4.34 per cent. The full table for 0102 Grains is given below.

Table 14.2.1 Imputed commodity shares for ‘0102 Grains’, one-step method, basic values

IOCC	Aust. Pdn ($ million)	Share (per cent)	Allocated to GSC1
01210010 Wheat (inc spelt) and meslin, unmilled	2089.1	0.539	2
0120020 Barley	618.9	0.159	3
01210030 Oats	169.1	0.043	3
01210040 Rice, in the husk	137.0	0.035	1
01210050 Grain, sorghum	79.0	0.020	3
01210065 Oilseeds and legumes for grain etc	680.3	0.174	5
01210080 Cereal grains n.e.c.	95.8	0.025	3
0102 Grains	3,869.2	1.000	

Note: Shares may not sum to 1 due to rounding.
Source: Table 1, ABS (1996, Cat. No. 5215.0).

Where an 8-digit I/O commodity group needed to be split and allocated to more than one GSC1, we employed a two step splitting method as illustrated in table 14.2.2 below. Take for example ‘02190010 Services to agriculture n.e.c.’ which normally belongs to IOCC 0200 services to agriculture. The first step was the same as that described above, in which the Australian production of 02190010 was expressed as a share of the Australian production of 0200. According to table 14.2.2 this is equal to $515.9 million, or 37 per cent.

The second step involved proxying the shares by estimating the level of Australian production of the GSC1s to which 02190010 was allocated to. In other words, we estimated the production of agricultural commodities of GSC1 codes 1 to 3, 5 to 7, 11 and 12. We then assumed that the share of ‘0219 services to agriculture n.e.c.’ followed this distribution. For example, Australian production of rice (GSC1 1) is $137 million while the Australian production of wheat (GSC1 2) is $2,258.2 million. The total Australian production for the above GSC1s is $10,105.1 million. If rice, wheat etc each used ‘0219 Services to agriculture n.e.c.’ in the same proportions, it followed that the share of 0219 allocated to rice was 1.4 per cent and for wheat 22.3 per cent for wheat. The final share is calculated by multiplying the first and second shares. For rice production the final share of 0200 Services to agriculture accounted by 0219 Services to agriculture n.e.c. is 0.50 per cent (0.37*0.014), while for wheat it was 8.3 per cent (0.37*0.0827).

Table 14.2.2 Imputed commodity shares for ‘02190010 services to agriculture n.e.c.’, two-step method, basic values

IOCC	Australian production ($ million) (Step 1)	Share (%) (Step 1)	Australian production ($ million) (Step 2)	Share (%) (Step)	Final share	Allocated to GSC1
02190010 p	515.9	0.370	137.0	0.014	0.0050	1
02190010 p			2,258.2	0.223	0.0827	2
02190010 p			962.8	0.095	0.353	3
02190010 p			775.3	0.077	0.284	5
02190010 p			98.4	0.010	0.0036	6
02190010 p			1,115.6	0.110	0.0409	7
02190010 p			2,314.3	0.229	0.848	11
02190010 p			2,443.5	0.242	0.895	12
02190010			10,105.1	1.000		

Source: Commission estimates; ABS Cat. No. 5215.0 (1996).

14.2.2.4 By industry

As with the commodity splits, we will discuss only the most commonly used splitting techniques. Because industry-data was only available for the manufacturing sector, we had to employ commodity splits to split the agriculture and services sectors.

The ABS can make available detailed industry files based on the manufacturing census. For 1992–93 there was no manufacturing census, and so the industry data was extrapolated on previous year trends.

As with the commodity splits, we employed both one-step and two-step splits. Where a four-digit ANZSIC industry was separated in its entirety from the IOCC group, a one-step split was sufficient. Analogous to the commodity split, when an ANZSIC industry itself was split, we undertook a two-step split.

Table 14.2.3 provides an example of a one-step industry split for the intermediate usage array. The I/O group 2101 meat and meat products comprised ANZSIC industries 2111 to 2113. The total intermediate usage at basic values of 2101 was available from the I/O tables (ABS 1996a, Cat. No. 5209.0), while the intermediate usage for the ANZSICs is available from the industry file variable TINTUSBV (total intermediate usage by basic values). Dividing TINTUSBV by the group's total intermediate usage gave us that share of the total intermediate use accounted by each ANZSIC industry. We then assumed that production technologies were sufficiently similar within an I/) commodity group that they employed commodities in the same proportions.

In cases where a four-digit ANZSIC industry was itself split we undertook a two-step split. The second split used Australian production data (obtained either from the commodity cards or the commodity details publication, ABS 1996b Cat. No. 5215.0), and was similar to the second step of a two-stage commodity split. For example, the I/O group 1100 Coal, oil and gas comprises of three four-digit ANZSICs 1101, 1102 and 1200. Part of 1200 was allocated to GSC1 16 and the remainder to GSC1 17 (table 14.2.4). The first step involved accounting for the intermediate use by each of the industries, and ANZSIC 1200 accounted for $1416.9 million of intermediate usage, or 33 per cent of the intermediate usage of 1100 Coal, oil and gas.

Table 14.2.3 Imputed industry shares for '2101 meat and meat products', one-step method, basic values

IOCC	Total intermediate usage ($ million)	Share (per cent)	GSC1
2111 Meat processing	5,832.1	0.729	19
2112 Poultry processing	1,184.0	0.148	20
2113 Bacon, ham, and small good manufacturing	982.7	0.122	20
2101 Meat and meat products	7,988.9	1.000	

Note: Shares may not sum to 1 due to rounding.
Source: Table 2, ABS (1996a, Cat. No. 5209.0) and unpublished industry data.

Table 14.2.4 Imputed industry shares for ‘1100 Coal, oil and gas’, two-step method, basic values

IOCC	Commodity group	Total intermediate use ($ million) (Step 1)	Share (%) (Step 1)	Australian production ($ million) (Step 2)	Share (%) (Step 2)	Final share	GSC1
1200	12000011	1,416.9	0.33	5,608.1	0.67	0.22	16
	12000024			1,125.6	0.14	0.04	17
	12000027			1,595.4	0.19	0.06	17
1100	Coal; oil and gas	4,335.3	1.00		1.00	1.00	

Note: Shares may not sum to 1 due to rounding.
Source: Unpublished ABS data, and ABS (1996b) Cat, No. 5215.0.

But to split ANZSIC 1200, we used commodity data. Australian production of 1200 was equal to $8,329 million, of which commodity 1200011 accounted for 67 per cent. Using Australian production data was of course only a proxy. Thus the share of industry ‘1100 coal, oil and gas’ which was allocated to GSC1 16 is equal to 0.33*0.67, or 0.22 (table 14.2.4).

14.2.2.5 Bringing the shares together

This stage of calculating the industry and commodity shares was to identify the particular shares that were used to split the various matrices. The industry shares for the intermediate and investment matrices (including commodity taxes) used:

- one and two-step splits of commodity shares for agriculture and services; and
- one and two-step splits for manufacturing, where the first split used ‘total intermediate usage at basic values’ from the industry files. Where required, the second step split used Australian production by commodity from available commodity cards.

The split of the labor employment vector used:

- one and two-step splits of commodity shares for agriculture and services; and
- one and two-step splits for manufacturing, where the first split used ‘wages’ from the industry files. Where required, the second step split used Australian production by commodity from available commodity cards.

The split of the land and capital employment vectors used:

- one and two-step splits using commodity shares for agriculture and services;
- one and two-step splits for manufacturing, where the first split used ‘gross operating surplus’ from the industry files. Where required, the second step split used Australian production by commodity from available commodity cards.
- land was only allocated to the first 12 GSC1 categories. Any excess land was allocated to capital.

14.2.2.6 Labor splits

The GTAP Release 4 data base separates labor into high-and low-skilled occupations. In the 1992–93 ORANI data base, payments to labor was disaggregated into eight occupation classes based on the first edition of the Australian Standard Classification of Occupations (ASCO). Table 14.2.5 below summarizes the simple concordance between ASCO (first edition) and the GSC1 high/low skilled split.

The Australian Bureau of Statistics has recently adopted the second edition ASCO which is more readily compatible with the International Standard Classification of Occupations (ISCO).

Table 14.2.5 Summary of occupation classifications

ISCO to GSC	
High Skilled	
0	Armed forces personnel
1	Profession, technical and related workers
2	Administrative and managerial workers
Low Skilled	
3	Clerical and related workers
4	Sales workers
5	Service workers
6	Agriculture, animal husbandry & forestry workers, fisherman and hunters
7-9	Production and related workers, transport equipment workers and laborers
ASCO (1st edition) to GSC	
High Skilled	
1	Managers and administrators
2	Professionals
Low Skilled	
3	Para-professionals
4	Tradespersons
5	Clerks
6	Sales persons & personal service workers
7	Plant and machine workers
8	Laborers and related workers

14.2.2.7 Correcting sales structures

One important outcome of applying shares to split a commodity (industry) group, in order to single out a detailed commodity (industry), is that the sales (cost) structure of that detailed commodity (industry) takes on the same pattern as the group from which it was split.

In the case of the Australian data, this was evident with GSC1 commodity ‘1. Paddy rice’ which was obtained by splitting ORANI commodity ‘4. Other grains’. ‘Other grains’ is both exported and consumed by households directly. We assumed that ‘paddy rice’ was used entirely as an intermediate input. Most ‘paddy rice’ was used by the ‘processed rice’ industry.

To correct for this discrepancy, the sales of ‘paddy rice’ to exports, government and private consumption was entirely re-allocated to the ‘processed rice’ industry. To maintain as much balance in the data base as possible, exports, government and private consumption were increased in the remaining ‘other grains’ commodities. Similarly, intermediate usage of the remaining ‘other grains’ commodities was reduced to offset the increased intermediate usage by the ‘processed rice’ industry. These adjustments took place directly using MODHAR.

A second adjustment took place with respect to the ‘processed rice’ commodity. As in the earlier case, the actual sales structure of the derived ‘processed rice’ commodity did not accurately reflect our expectation that a large share of Australian rice was exported. Instead, it reflected the sales structures of the two commodities from which it was constructed: namely ORANI 20 ‘Flour mill products and cereal foods’ (which was split to obtain rice flour and cereals), and ORANI 23 ‘Other food products’ (which was split to obtain dehusked and packed rice). The ABS did not have any available data on the sales structure for rice flour and cereals, so it was necessary to estimate this commodity by applying a two-step commodity split similar to the process described ‘services to agriculture n.e.c.’ above.

The ABS did have detailed data on the sales structure of dehusked and packed rice in its unpublished commodity cards (IOCC 21520040 ‘rice’). This data was used instead of the implied shares. Adjustments were made to the remaining splits of ORANI commodities 20 and 23 so that the data base remained balanced. Again this change was implemented through MODHAR.

14.2.2.8 Other limits

As mentioned earlier, Australian production of commodities was used to split the agriculture and services for the one-step split, and in the second step of a two-step split for manufacturing industries. Using commodity data raises particular issues for industry splits where the industry that is being split is multi product.

For the agriculture I/O groups, which are by definition single-product industries, the production of the industry is identical to the production of that commodity (by definition). Using commodity data to split agriculture does not pose any problems. However, for manufacturing and services industries, which are to varying degrees multi product, this poses a potential problem, for we are essentially assuming that the production technologies of all industries producing commodity are the same.

As mentioned earlier, there are a number of other proxy measures used to estimate splits. In the case of ‘2610 glass and glass products’, which had to be split between GSC1 34 and 47, we used published Commission reports to infer ratios of 0.75 and 0.25 respectively. More detail of these approaches is given in the footnotes to the spreadsheets in which the calculations were made.

14.2.3 Aggregating the data base

The first step in the exercise was to ensure that the ORANI-92/93 arrays corresponded to the GTAP arrays. For example, since ORANI has nine margins while GTAP has none, the ORANI margins had to be aggregated across commodities, split into domestic and imported components, and then assigned to their respective margins commodities in the intermediate usage and other arrays.

14.2.4 Diagnostics

The data was checked first by comparing the cost and sales structures, to see if they met our prior expectations. Spot checks were also taken for the ‘paddy’ rice and ‘processed’ rice industries, to ensure that sufficient ‘paddy’ rice was used as an intermediate to ‘processed’ rice production, and that no ‘paddy’ rice was either exported or imported into Australia. Second, we compared our 50x50 data base against the more aggregated 38x38 1989–90 SALTER data base using an approximate concordance table. Despite the lack of strict comparability between the two data base, the exercise proved helpful in picking sources of ‘large’ discrepancies. No homogeneity tests were undertaken.

References

ABS. 1996a. “Australian national accounts: input-output tables” Cat. No. 5209.0, AGPS, Canberra.

ABS. 1996b. “Australian national accounts: input-output tables — commodity details”, Cat. No. 5215.0, AGPS, Canberra.

Calder W, McDougall R and A Strzelecki. 1993. “Procedures for later stage processing of single-region input-output data for SALTER”, SALTER Working Paper, No. 18, June, Industry Commission.

Industry Commission. 1994. “The SALTER model of the world economy: Model structure, data base and parameters — A study undertaken by the Industry Commission on behalf of the Department of Foreign Affairs and Trade”, April, Canberra.

Huff, K and R. McDougall. 1996. “Contributing input-output tables to the GTAP data base”, GTAP Technical Paper No. 1, November 1996.

Appendix: Concordance tables

Table 14.2.A1 List of I/O and ORANI-92/93 commodity/industry codes and descriptions

IOCC	Commodity/industry	ORANI	IOCC	Commodity/industry	ORANI
101	Sheep	1	2303	Other wood products	37
102	Grains	2	2304	Pulp, paper and paperboard	38
103	Beef cattle	3	2305	Paper bags and containers	39
104	Dairy cattle	4	2306	Other paper products	40
105	Pigs	5	2401	Printing; services to printing	41
106	Poultry	6	2402	Publishing; recorded media etc	42
107	Other agriculture	7	2501	Petroleum and coal products	43
200	Services to agric.; hunting	8	2502	Fertilisers	44
300	Forestry and logging	9	2503	Other basic chemicals	45
400	Commercial fishing	10	2504	Paints	46
1100	Coal; oil and gas	11	2505	Pharmaceuticals etc	47
1301	Iron ores	12	2506	Soap and other detergents	48
1302	Non-ferrous metal ores	13	2507	Cosmetics and toiletries	49
1400	Other mining	14	2508	Other chemical products	50
1500	Services to mining	15	2509	Rubber products	51
2101	Meat and meat products	16	2510	Plastic products	52
2102	Dairy products	17	2601	Glass and glass products	53
2103	Fruit and vegetable	18	2602	Ceramic products	54
2104	Oils and fats	19	2603	Cement and lime	55
2105	Flour and cereal foods	20	2604	Concrete slurry	56
2106	Bakery products	21	2605	Plaster, other concrete prod.	57
2107	Confectionary	22	2606	Non-metallic min. products	58
2108	Other food products	23	2701	Iron and steel	59
2109	Soft drinks, cordials,	24	2702	Basic non-ferrous metals etc	60
2110	Beer and malt	25	2703	Structural metal products	61
2111	Wine and spirits	26	2704	Sheet metal products	62
2112	Tobacco products	27	2705	Fabricated metal products	63
2201	Wool scouring	28	2801	Motor vehicles and parts etc	64
2202	Textile fibres, yarns etc	29	2802	Ships and boats	65
2203	Textile products	30	2803	Railway equipment	66
2204	Knitting mill products	31	2804	Aircraft	67
2205	Clothing	32	2805	Scientific etc equipment	68
2206	Footwear	33	2806	Electronic equipment	69
2207	Leather and leather	34	2807	Household appliances	70
2301	Sawmill products	35	2808	Other electrical equipment	71
2302	Plywood, veneer and fab.	36	2809	Agricultural machinery	72

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Table 14.2.A1 List of I/O and ORANI-92/93 commodity/ industry codes and descriptions (continued)

IOCC	Commodity/industry	ORANI
2810	Mining etc equipment	73
2811	Other machinery and equipment	74
2901	Prefabricated buildings	75
2902	Furniture	76
2903	Other manufacturing	77
3601	Electricity	78
3602	Gas	79
3701	Water, sewerage and drainage	80
4101	Residential building	81
4102	Other construction	82
4501	Wholesale trade	83
5101	Retail trade	84
5401	Mechanical repairs	85
5402	Other repairs	86
5701	Accommodation, cafes &	87
6101	Road transport	88
6201	Rail, pipeline, other transp.	89
6301	Water transport	90
6401	Air and space transport	91
6601	Services to transport; storage	92
7101	Communication services	93
7301	Banking	94
7302	Non-bank finance	95
7303	Financial asset investors	96
7401	Insurance	97
7501	Services to finance etc	98
7701	Ownership of dwellings	99
7702	Other property services	100
7801	Scientific research etc	101
7802	Legal, accounting etc services	102
7803	Other business services	103
8101	Government administration	104
8201	Defense	105
8401	Education	106
8601	Health services	107
8701	Community services	108
9101	Motion picture, radio etc	109
9201	Libraries, museums, arts	110
9301	Sport, gambling etc	111
9501	Personal services	112
9601	Other services	113
	Non-competing imports	114

Table 14.2.A2 Concording from GSC1 Rev. 1 to IOCC, ANZSIC (4) and ANZSIC/IOCC (8), 1992-93

GSC1 1 Paddy rice	
01210040	Rice, in the husk (incl 0122p)
02190010p	Services to agriculture n.e.c.
GSC1 2 Wheat	
01210010	Wheat (incl spelt) and meslin (incl 0122p)
02190010p	Services to agriculture n.e.c.
01690030	Hops
GSC1 3 Cereal grains n.e.c.	
01210020	Barley, unmilled (incl 0122p)
01210030	Oats, unmilled (incl 0122p)
01210050	Grain, sorghum (incl 0122p)
01210080	Cereal grains n.e.c. (incl 0122p)
02190010p	Services to agriculture n.e.c.
GSC1 4 Vegetables, fruits and nuts	
01130010–70	Potatoes to Tomatoes
01130080p	Vegetables n.e.c.
01140010–30	Grapes, currents, raisins, sultanas
01150010&20	Apples, pears, quinces
01160010	Stone fruit
01170010	Kiwi fruit
01190010–70	Nuts, berries, tropical fruit
01690010	Mushrooms
GSC1 5 Oilseeds	
01210065	Oilseeds, legumes for grain (incl 0122p); forage products
01690060p	Agriculture n.e.c.
02110020	Cotton seed
02190010p	Services to agriculture n.e.c.
GSC1 6 Sugar cane and sugar beet	
01610010	Sugar cane
02190010p	Services to agriculture n.e.c.
GSC1 7 Plant-based fibers	
01620010	Cotton (excl ginned)
01698300	Natural rubber
02110010	Raw cotton
02111970	Cotton waste
02190010p	Services to agriculture n.e.c.
GSC1 8 Crops n.e.c.	
9525	Gardening services
01110010	Plant nurseries
01120010	Cut flowers & seeds
01130080p	Vegetables n.e.c.
01690020	Tobacco
01690040	Grass, lucerne, clover seed
01690050	Hay, cereal grass & fodder
01690060p	Agriculture n.e.c.

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Table 14.2.A2 Concording from GSC1 Rev.1 to IOCC, ANZSIC (4) and ANZSIC/IOCC (8) 1992-93 (continued)

	01698000	Raw coffee and chicory
	01698200	Cocoa beans
GSC1 9 Bovine cattle, sheep and goats, horses		
0103		Beef cattle
	01240010	Sheep and lambs (incl 0122p, 0123p)
	01520010	Horse studs
	02130010	Aerial agricultural services
GSC1 10 Animal products n.e.c.		
0105		Pigs
0106		Poultry
	01530010	Deer farming
	01590010	Honey
	02200010	Skins and pieces, raw
GSC1 11 Raw milk		
0104		Dairy cattle
	02190010p	Services to agriculture n.e.c.
GSC1 12 Wool, silk-worms		
	01240020	Wool (shorn and dead) (incl 0122p, 0123p)
	02120010	Sheep shearing services
	02190010p	Services to agriculture n.e.c.
GSC1 13 Forestry		
0300		Forestry and Logging
GSC1 14 Fishing		
0400		Commercial fishing
GSC1 15 Coal		
	11010010	Black coal (all types incl briquettes)
	11020010p	Brown coal-lignite (incl briquettes)
GSC1 16 Oil		
1520p		Other mining services
	12000011	Crude oil (incl condensate)
GSC1 17 Gas		
1520p		Other mining services
	12000024	Natural gas
	12000027	Liquefied natural gas; liquefied natural petroleum gases; oil and gas n.e.c.
GSC1 18 Minerals n.e.c.		
1301		Iron ores
1302		Non-ferrous metal ores
1411		Gravel and sand quarrying
1419		Construction material mining n.e.c.
1420		Other mining
	11020010p	Brown coal-lignite (incl briquettes) (peat)

contd

Table 14.2.A2 Concording from GSC1 Rev.1 to IOCC, ANZSIC (4) and ANZSIC/IOCC (8), 1992-93 (continute)

GSC1 19 Bovine cattle, sheep and goat, horse meat products	
2111	Meat processing
GSC1 20 Meat products n.e.c.	
2112	Poultry processing
2113	Bacon, ham and small goods
GSC1 21 Vegetable oils and fats	
2104	Oils and fats
GSC1 22 Dairy products	
2121	Milk and cream processing
2122	Ice cream manufacturing
2129	Dairy product manufacturing n.e.c.
GSC1 23 Processed rice	
2151p	Flour mill product manufacturing
GSC1 24 Sugar	
2171	Sugar manufacturing
GSC1 25 Food products n.e.c.	
2103	Fruit and vegetable products
2106	Bakery products
2107	Confectionary
2151p	Flour mill product manufacturing
2152	Cereal food and baking mix manufacturing
2173	Seafood processing
2174	Prepared animal and bird feed
2179	Food manufacturing n.e.c.
GSC1 26 Beverages and tobacco products	
2109	Soft drinks, cordials and syrups
2110	Beer and malt
2111	Wine and spirits
2112	Tobacco product manufacturing
GSC1 27 Textiles	
2201	Wool scouring
2202	Textile fibers, yarns and woven fabrics
2204	Knitting mill products
2221	Made-up textile product manufacturing
2222	Textile floor covering manufacturing
2223	Rope, cordage and twine manufacturing
2229p	Textile product manufacturing n.e.c.

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Table 14.2.A2 Concording from GSC1 Rev.1 to IOCC, ANZSIC (4) and ANZSIC/IOCC (8), 1992-93 (continued)

GSC1 28 Wearing apparel	
2205	Clothing
2261p	Leather tanning and fur dressing
GSC1 29 Leather products	
2250	Footwear
2261p	Leather tanning and fur dressing
GSC1 30 Wood products	
2301	Sawmill products
2302	Plywood, veneer and fabricated wood
2303	Other wood products
2919	Prefabricated building manufacturing n.e.c.
2921	Wooden furniture and upholstered seat manufacturing
2923	Mattress manufacturing (except rubber)
2929	Furniture manufacturing n.e.c.
GSC1 31 Paper products and publishing	
2305	Paperboard containers; paper bags and sacks
2306	Paper bag and sacks
2401	Printing and services to printing
2229p	Textile product manufacturing
2331p	Pulp, paper and paperboard
2421p	Newspaper printing or publishing
2422p	Other periodical publishing
2423	Book and other publishing
2430	Recorded media manufacturing and publishing
GSC1 32 Petroleum, coal products	
2501	Petroleum and coal products
GSC1 33 Chemical, rubber, plastic products	
2502	Fertilizers
2503	Other basic chemicals
2504	Paints
2505	Medicinal and pharmaceutical products; pesticides
2506	Soap and other detergents
2507	Cosmetic and toiletry preparations
2508	Other chemical products
2509	Rubber products
2561	Plastic blow moulded product
2562	Plastic extruded product
2563	Plastic bag and film manufacturing
2564p	Plastic product rigid fibre reinforced
2565	Plastic foam product manufacturing
2566	Plastic injection moulded products

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Table 14.2.A2 Concording from GSC1 Rev.1 to IOCC, ANZSIC (4) and ANZSIC/IOCC (8), 1992-93 (continued)

GSC1 34 Mineral products n.e.c.	
2602	Ceramic products
2603	Cement and lime
2604	Concrete slurry
2605	Plaster and other concrete products
2606	Other non-metallic mineral products
2610p	Glass and glass products
GSC1 35 Ferrous metals	
2711	Basic iron and steel manufacturing
2712p	Iron and steel casting and forging
2713	Steel and pipe
GSC1 36 Non-ferrous metals	
2721	Alumina production
2722p	Aluminum smelting
2723p	Copper, silver, lead, zinc smelting
2729	Basic Non-ferrous metal manufacturing n.e.c.
2731p	Aluminum, drawing, rolling and extruding
2733	Non-ferrous metal casting
GSC1 37 Metal products	
2703	Structural metal products
2704	Sheet metal products
2712p	Iron and steel casting and forging
2731p	Aluminum, drawing, rolling and extruding
2732	Non-ferrous metal rolling, drawing
2761	Hand tools and general hardware
2762	Spring and wire product manufacturing
2763	Nut, bolt, screw and rivet manufacturing
2764	Metal coating and finishing
2765	Non-ferrous pipe fitting manufacturing
2769p	Fabricated metal product manufacturing n.e.c.
2869p	Industrial machinery and equipment n.e.c.
2911	Prefabricated metal building manufacturing
2922	Sheet metal furniture manufacturing
GSC1 38 Motor vehicles and parts	
2811	Motor vehicle manufacturing
2812	Motor vehicle body manufacturing
2813	Automotive electrical and instruments
2819	Automotive component manufacturing n.e.c.
GSC1 39 Transport equipment n.e.c.	
2802	Ships and boats
2803	Railway equipment
2804	Aircraft
2829	Transport equipment n.e.c.

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Table 14.2.A2 Concording from GSC1 Rev.1 to IOCC, ANZSIC (4) and ANZSIC/IOCC (8), 1992-93 (continued)

GSC1 40 Electronic equipment	
2806	Electronic equipment
GSC1 41 Machinery and equipment n.e.c.	
2805	Photographic and scientific equipment
2807	Household appliances
2808	Other electrical equipment
2809	Agricultural machinery
2810	Mining and construction mach.; lifting and material handling equip
2430	Recorded media manufacturing and publishing
2769p	Fabricated metal product manufacturing n.e.c.
2863	Food processing machinery manufacturing
2864	Machine tool and parts manufacturing
2865	Pump and compressor manufacturing
2867	Commercial space heating and cooling equipment manufacturing
2869p	Industrial machinery and equipment n.e.c.
GSC1 42 Manufactures n.e.c.	
2903	Other manufacturing
GSC1 43 Electricity	
3601	Electricity supply
GSC1 44 Gas manufacture, distribution	
3602	Gas supply
3701p	Water supply (provision of hot water)
GSC1 45 Water	
3701p	Water supply
GSC1 46 Construction	
4101	Residential building construction
4102	Other construction
GSC 47 Trade, transport	
4501	Wholesale trade
5401	Mechanical repairs
5402	Other repairs
5701	Accommodation, cafes and restaurants
6101	Road transport
6201	Rail, pipeline and other transport
6301	Water transport
6401	Air and space transport
6601	Services to transport; storage
7101	Communication services
2331p	Pulp, paper and paperboard manufacturing (recycling)

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Table 14.2.A2 Concording from GSC1 Rev.1 to IOCC, ANZSIC (4) and ANZSIC/IOCC (8), 1992-93 (continued)

2564p	Plastic product rigid fibre reinforced (recycling)
2610p	Glass and glass products (recycling)
2722p	Aluminum smelting (recycling)
2723p	Copper, silver, lead, zinc smelting (recycling)
5110p to 5259p	Retail trade (excl household repair services)
5311p to 5329p	Retail trade (excl household repair services)
7741	Motor vehicle hiring
7742	Other transport equipment leasing
GSC1 48 Financial, business and recreational services	
7301	Banking
7302	Non-banking finance
7303	Financial asset investors
7401	Insurance
7501	Services to finance, investment, insurance
7802	Legal, accounting, marketing and business management services
7803	Other business services
9101	Motion picture, radio and television services
9201	Libraries, museums and the arts
9301	Sport, gambling and recreational services
1511	Petroleum exploration (own account)
1512	Petroleum exploration services
01590020	Pet breeding and live animals n.e.c.
1513	Mineral exploration (own account)
1514	Mineral exploration services
2421p	Newspaper printing and publishing (news agency activities)
2422p	Other periodical publishing (news agency activities)
5110p to 5259p	Retail trade (household repair services component)
5261	Household equipment repair services
5269	Household equipment repair services n.e.c.
5311p to 5329p	Retail trade (household repair services component)
7712	Commercial property operators and developers
7720	Real estate agents
7730	Non-financial asset investors
7743	Plant hiring and leasing
7821	Architectural services
7822	Surveying services
7823	Consulting engineering services
7829	Technical services n.e.c.
7831	Data processing activities

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Table 14.2.A2 Concording from GSC1 Rev.1 to IOCC, ANZSIC (4) and ANZSIC/IOCC (8), 1992-93 (continued)

7832	Information storage and retrieval services
7833	Computer maintenance services
7834	Computer consultancy services
9511	Video hire outlets
9519	Personal and household good hiring n.e.c.
9521	Laundries and dry cleaners
9522	Photographic film processing
9523	Photographic studios
9524	Funeral directors, crematories and cemeteries
9526	Hairdressing and beauty salons
9529	Personal services n.e.c.
9700	Private households employing staff
GSC1 49 Public administration and defense, education, health	
8101	Government administration
8201	Defense
8401	Education
8601	Health services
8701	Community services
9601	Other services
7810	Scientific research
3702	Sewerage and drainage services
GSC1 50 Dwellings	
7701	Ownership of dwellings

The structure of the concordance is as follows:

GSC1 sectoral classification in bold	
1234	IOCC four-digit classification
1234	ANZSIC four-digit classification
1234 p	part of ANZSIC four-digit classification
12345678	ANZSIC/IOCC eight-digit classification
12345678 p	part of ANZSIC/IOCC eight-digit classification