

Chapter 3

Data Base Summary: Sectoral Data

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This chapter summarizes sectoral sales and costs data in the GTAP 5 data base. The data in the book version of this chapter refer to the world economy as an aggregate. Data for the individual GTAP regions is available from the CD-ROM package that accompanies this documentation and may also be found in version of the chapter that is downloadable from the GTAP website. The sectoral data reported draw heavily on the source input-output (I-O) tables from varying years (see chapter 11). Since the GTAP 5 data base was constructed by combining these tables with 1997 macroeconomic data (see previous chapter), the flows reported here will not be identical to those in the I-O tables. Thus, these figures should be treated as *estimates* of inter-industry flows. Readers interested in analyzing a particular sector/region would be well-advised to thoroughly familiarize themselves with this information in advance, as it will play an important role in determining the outcome of any model simulations.

3.1 *Disposition of Sales*

Tables 3.1 and 3.2 report sales summaries for the world region in all 57 GTAP 5 sectors. Table 3.1 reports this sales information in value terms (millions of 1997 US\$), while table 3.2 provides the same information in share form. For purposes of discussion, we focus here on the world economy as an aggregate with columns representing sectoral sales to intermediate usage (IU), private consumption (C), investment (I), government consumption (G), and exports (X). Data for the aggregate world region may be used as a reference point to compare with data on specific regions.

The 57 sectors in the GTAP 5 data base may be aggregated into 3 broad sectors, namely, food and agriculture, manufactures, and services. The 20 food and agricultural sectors (sectors 1-12,19-26) together comprise 9 percent of world sales value. The 22 manufacturing sectors (sectors 13-18, 27-42) contribute 31 percent. The high-value services sectors (sectors 43-57) compose the largest chunk at 60 percent of world sales value. The relative size of each sector is due largely to degree of sectoral disaggregation of the data base. The residual sector, other food, is the largest sector in the food and agriculture category. Chemicals, rubber and plastics and machinery and equipment are the two largest manufacturing sectors. Under services, the trade sector and the education/health sector are the largest, each contributing roughly 11 percent of world total sales.

Table 3.2 shows that most primary agricultural commodities, especially paddy rice, other grains, sugar cane, cattle/sheep, and raw milk are consumed much less directly but are instead sold mostly for further processing with more than 70 percent of world average sales going to domestic processors. On the other hand, more than 50 percent of sales of fruits and vegetables, fish, animal products (cattle/sheep, other meat), dairy, processed rice, other food, and beverages and tobacco, go directly to private consumption.

Natural resources (coal, oil, gas, and other minerals) are either exported or sold to refineries or distribution networks. Manufactures may be broadly divided into those which sell a large share of their output to consumers and the export market (wearing apparel, leather products, motor vehicles, transport equipment, electronic equipment, machinery and equipment, other manufactures) and those which sell mostly to other domestic firms (textiles, wood products, pulp and paper, petroleum, chemicals products, mineral products, and metal products).

Services are sold to both firms and households, by and large. The exceptions are construction services which are largely investment goods, and dwellings, which are by definition a consumption good. Electricity services, gas distribution, and financial services are also mostly provided for intermediate usage.

Construction is the most important component of investment in aggregate. The shares of machinery and equipment, motor vehicles, electronic equipment, and transport equipment going to

investment are also significant. As can be expected, a large share of education and health services go to government consumption.

Regional data for sectoral sales in value terms are available in tables 3.5.1 - 3.5.66 on the GTAP web site and CD-ROM versions of this chapter.

3.2 *Structure of Sectoral Costs*

Tables 3.3 reports the structure of sectoral costs in the GTAP 5 data base in value terms. That total cost for each sector, as shown in the last column in table 3.3, should equal total sales for each sector (last column in table 3.1) is a requirement that is imposed on the data base. Sectoral costs are composed of payments for intermediate usage, factors or production (unskilled and skilled labor, capital, land, natural resources), and other taxes. Note that land is used only in primary agricultural sectors and natural resources are used only in the extractive sectors.

As noted in the previous chapter, the primary factor shares in agriculture are based on econometric evidence. Elsewhere, the labor shares are inherited from the I-O tables, with capital's share claiming the residual (including returns to self employed labor in most cases).

Table 3.4 presents the sectoral costs information in percentage shares. Intermediate inputs account for more than 70 percent of sectoral costs in the processed food sectors (meat products, vegetable oils, dairy products, processed rice, and refined sugar). Intermediate inputs also account for a large share of the costs of manufactured goods, especially petroleum, metals, and motor vehicles.

The cost share of unskilled labor is relatively high in the primary agricultural sectors, ranging from 18 to 33 percent. Total labor (skilled and unskilled) costs share accounts for more than one-third of the costs of trade and other transport services, financial services, insurance services, and education/health services.

Capital constitutes 80 percent of the cost of dwellings. The forestry sector, oil, gas, and business services are also relatively capital-intensive, with capital accounting for more than 30 percent of sectoral costs. The cost share of indirect taxes is highest at 12.6 percent in the beverages and tobacco sector. This is followed by the gas sector at 8.4 percent and gas distribution at 4.1 percent.

Regional data for sectoral cost in value terms are available in tables 3.6.1 - 3.6.66 on the GTAP web site and CD-ROM versions of this chapter.

Table 3.1 Sales Summary, World (1997 US\$ million)

GTAP Sectors	Intermediate Usage	Private Consumption	Investment	Government Consumption	Exports	Total
Paddy rice	114267	32765	892	235	1252	149410
Wheat	59462	25222	138	288	16959	102070
Other grains	103549	22542	115	292	14128	140625
Vegetables, fruit	144513	246488	4163	1315	42733	439212
Oil seeds	60666	17012	323	134	15735	93871
Sugar cane	38365	9299	290	110	50	48115
Plant-based fibers	30623	6416	123	78	9889	47129
Other crops	79842	38334	1657	861	38813	159506
Cattle, sheep	169598	27384	1685	185	6252	205104
Animal products	175009	95237	4939	484	14907	290575
Raw milk	152138	44336	4399	512	174	201558
Wool	18126	1755	370	147	2441	22839
Forestry	84129	28601	3937	1541	10648	128857
Fishing	54759	77572	421	124	9615	142490
Coal	73599	2311	0	1	20003	95914
Oil	204912	16	0	0	230860	435788
Gas	44455	1065	0	0	47117	92637
Other minerals	188647	2053	543	842	36255	228339
Cattle, sheep meat	76377	146349	343	2920	19693	245682
Other meat	66707	177532	16	1743	28747	274745
Vegetable oils	65791	63248	54	353	31896	161341
Dairy products	74913	178026	24	3819	28477	285258
Processed rice	27105	122419	19	345	5143	155032
Sugar	41926	44196	90	439	11400	98051
Other food	359219	617241	554	9945	118564	1105522
Beverages, tobacco	126663	412022	131	839	49958	589614
Textiles	382217	137352	6062	2496	191407	719533
Wearing apparel	73990	291949	2017	3289	141453	512699
Leather products	49987	70594	109	7679	76664	205033
Wood products	284859	113683	54680	4225	107186	564633
Paper, publishing	822590	160563	548	25388	134112	1143200
Petroleum	386019	136352	0	28	101256	623656
Chemicals, rubber	1492562	363135	8552	35496	594212	2493958
Mineral products	562443	36064	4781	3952	100421	707661
Ferrous metals	682692	1384	3209	504	148827	836615
Other metals	291648	1661	823	318	152224	446674
Metal products	687567	43446	86694	6502	112721	936928

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Table 3.1 Sales Summary, World (1997 US\$ million) (Contd)

GTAP Sectors	Intermediat e Usage	Private Consumptio n	Investment	Government Consumptio n	Exports	Total
Motor vehicles	468917	312081	317115	13043	459317	1570474
Transport equipment	101713	42422	70412	41314	151075	406936
Electronic equipt	409506	150932	268916	12689	702566	1544609
Machinery, equipt	738779	127957	550661	63516	946011	2426924
Other manufactures	196518	151279	51502	4757	143508	547564
Electricity	711908	209240	1	28	22688	943865
Gas distribution	77380	20032	1	12	2452	99878
Water	96450	69824	81	13528	1079	180962
Construction	664024	40675	3061694	215426	35986	4017806
Trade	2180848	3582971	362873	41695	131086	6299472
Other transport	1162988	585771	29867	55625	216713	2050963
Water transport	77259	35865	1015	5100	191667	310907
Air transport	121413	93777	3097	7142	168829	394259
Communication	472346	351050	9602	18326	30773	882097
Financial services	1394350	470592	27580	27616	36967	1957104
Insurance	266936	445293	151	3321	39091	754793
Business services	2859444	921863	224378	107206	290818	4403708
Recreatl services	951731	1190012	21354	54868	67708	2285674
Education, health	589996	1702352	2596	3418678	98775	5812395
Dwellings	64902	1787929	2507	1420	0	1856758
TOTAL	21959338	16087539	5198105	4222738	6409301	53877012

Table 3.2 Sales Summary, World, 1997 (percent)

GTAP Sectors	Intermediate Usage	Private Consumption	Investment	Government Consumption	Exports	Total
Wheat	58.3	24.7	0.1	0.3	16.6	100
Other grains	73.6	16.0	0.1	0.2	10.0	100
Vegetables, fruit	32.9	56.1	0.9	0.3	9.7	100
Oil seeds	64.6	18.1	0.3	0.1	16.8	100
Sugar cane	79.7	19.3	0.6	0.2	0.1	100
Plant-based fibers	65.0	13.6	0.3	0.2	21.0	100
Other crops	50.1	24.0	1.0	0.5	24.3	100
Cattle, sheep	82.7	13.4	0.8	0.1	3.0	100
Animal products	60.2	32.8	1.7	0.2	5.1	100
Raw milk	75.5	22.0	2.2	0.3	0.1	100
Wool	79.4	7.7	1.6	0.6	10.7	100
Forestry	65.3	22.2	3.1	1.2	8.3	100
Fishing	38.4	54.4	0.3	0.1	6.7	100
Coal	76.7	2.4	0.0	0.0	20.9	100
Oil	47.0	0.0	0.0	0.0	53.0	100
Gas	48.0	1.1	0.0	0.0	50.9	100
Other minerals	82.6	0.9	0.2	0.4	15.9	100
Cattle, sheep meat	31.1	59.6	0.1	1.2	8.0	100
Other meat	24.3	64.6	0.0	0.6	10.5	100
Vegetable oils	40.8	39.2	0.0	0.2	19.8	100
Dairy products	26.3	62.4	0.0	1.3	10.0	100
Processed rice	17.5	79.0	0.0	0.2	3.3	100
Sugar	42.8	45.1	0.1	0.4	11.6	100
Other food	32.5	55.8	0.1	0.9	10.7	100
Beverages, tobacco	21.5	69.9	0.0	0.1	8.5	100
Textiles	53.1	19.1	0.8	0.3	26.6	100
Wearing apparel	14.4	56.9	0.4	0.6	27.6	100
Leather products	24.4	34.4	0.1	3.7	37.4	100
Wood products	50.5	20.1	9.7	0.7	19.0	100
Paper, publishing	72.0	14.0	0.0	2.2	11.7	100
Petroleum	61.9	21.9	0.0	0.0	16.2	100
Chemicals, rubber	59.8	14.6	0.3	1.4	23.8	100
Mineral products	79.5	5.1	0.7	0.6	14.2	100
Ferrous metals	81.6	0.2	0.4	0.1	17.8	100
Other metals	65.3	0.4	0.2	0.1	34.1	100
Metal products	73.4	4.6	9.3	0.7	12.0	100

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Table 3.2 Sales Summary, World, 1997 (percent) (Continued)

GTAP Sectors	Intermediate Usage	Private Consumption	Investment	Government Consumption	Exports	Total
Motor vehicles	29.9	19.9	20.2	0.8	29.2	100
Transport equipment	25.0	10.4	17.3	10.2	37.1	100
Electronic equipt	26.5	9.8	17.4	0.8	45.5	100
Machinery, equipt	30.4	5.3	22.7	2.6	39.0	100
Other manufactures	35.9	27.6	9.4	0.9	26.2	100
Electricity	75.4	22.2	0.0	0.0	2.4	100
Gas distribution	77.5	20.1	0.0	0.0	2.5	100
Water	53.3	38.6	0.0	7.5	0.6	100
Construction	16.5	1.0	76.2	5.4	0.9	100
Trade	34.6	56.9	5.8	0.7	2.1	100
Other transport	56.7	28.6	1.5	2.7	10.6	100
Water transport	24.8	11.5	0.3	1.6	61.6	100
Air transport	30.8	23.8	0.8	1.8	42.8	100
Communication	53.5	39.8	1.1	2.1	3.5	100
Financial services	71.2	24.0	1.4	1.4	1.9	100
Insurance	35.4	59.0	0.0	0.4	5.2	100
Business services	64.9	20.9	5.1	2.4	6.6	100
Recreatl services	41.6	52.1	0.9	2.4	3.0	100
Education, health	10.2	29.3	0.0	58.8	1.7	100
Dwellings	3.5	96.3	0.1	0.1	0.0	100
TOTAL	40.8	29.9	9.6	7.8	11.9	100

Table 3.3 Cost Summary, World (1997 US\$ million)

GTAP Sectors	Interm. Usage	Unskilled Labor	Skilled Labor	Capital	Land	Natural Resources	Other Taxes	Total
Paddy rice	50614	46676	486	17431	34806	0	-604	149410
Wheat	45539	28755	1027	14812	13764	0	-1828	102070
Other grains	57826	40257	1476	21883	22555	0	-3372	140625
Vegetables, fruit	149901	141267	3642	66940	76068	0	1394	439212
Oil seeds	31735	27457	939	16636	18065	0	-962	93871
Sugar cane	16381	13952	367	8144	9570	0	-298	48115
Plant-based fibers	24233	10207	185	4445	7692	0	368	47129
Other crops	52983	52128	2102	26246	25118	0	930	159506
Cattle, sheep	126925	38636	1626	20656	17778	0	-516	205104
Animal products	185537	52753	1366	22346	28203	0	370	290575
Raw milk	107034	47104	2020	23916	22922	0	-1438	201558
Wool	12277	5572	107	2472	2131	0	280	22839
Forestry	46005	26957	851	45191	0	9037	815	128857
Fishing	58385	23129	734	26783	0	32389	1070	142490
Coal	36051	18501	3170	14581	0	23114	497	95914
Oil	124945	32906	10773	148732	0	108027	10405	435788
Gas	26144	6921	1759	28711	0	21325	7777	92637
Other minerals	123072	32087	8677	44603	0	14931	4969	228339
Cattle, sheep meat	206716	17042	4177	17974	0	0	-227	245682
Other meat	224053	23869	5960	20924	0	0	-60	274745
Vegetable oils	125795	11912	3236	19310	0	0	1088	161341
Dairy products	216302	24279	6375	40801	0	0	-2498	285258
Processed rice	125981	7620	1514	18343	0	0	1574	155032
Sugar	72746	8155	2226	14823	0	0	100	98051
Other food	760952	121567	40115	171199	0	0	11689	1105522
Beverages, tobacco	310890	52316	17151	134779	0	0	74478	589614
Textiles	495982	99459	21903	88566	0	0	13624	719533
Wearing apparel	330832	86959	17832	63951	0	0	13125	512699
Leather products	137938	32162	6177	25304	0	0	3452	205033
Wood products	359924	96241	23183	80326	0	0	4958	564633
Paper, publishing	675140	184941	85982	180242	0	0	16894	1143200
Petroleum	554918	14019	6585	38950	0	0	9185	623656
Chemicals, rubber	1665105	271698	147611	370650	0	0	38894	2493958
Mineral products	421461	114823	35396	119979	0	0	16002	707661
Ferrous metals	610911	99158	31005	81919	0	0	13622	836615
Other metals	327673	49136	16119	46583	0	0	7163	446674
Metal products	566806	181677	63461	110076	0	0	14908	936928

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Table 3.3 Cost Summary, World (1997 US\$ million) (Continued)

GTAP Sectors	Interm. Usage	Unskilled Labor	Skilled Labor	Capital	Land	Natural Resources	Other Taxes	Total
Motor vehicles	1175592	183474	84364	119588	0	0	7456	1570474
Transport equipment	255638	71158	35643	38903	0	0	5594	406936
Electronic equipt	1043392	187258	118207	177330	0	0	18422	1544609
Machinery, equipt	1448912	384818	242151	319865	0	0	31177	2426924
Other manufactures	343616	79606	24034	87616	0	0	12692	547564
Electricity	540141	62429	41831	278379	0	0	21086	943865
Gas distribution	42051	16308	9245	28205	0	0	4069	99878
Water	69812	35247	19815	52071	0	0	4016	180962
Construction	2272060	852278	314263	517192	0	0	62013	4017806
Trade	2401983	1691766	594132	1449873	0	0	161718	6299472
Other transport	940267	513674	174565	410662	0	0	11796	2050963
Water transport	209711	40138	15057	41656	0	0	4345	310907
Air transport	251602	69909	21382	45592	0	0	5774	394259
Communication	300766	123765	131141	315226	0	0	11199	882097
Financial services	741099	308195	374442	487189	0	0	46178	1957104
Insurance	347158	140342	152546	98546	0	0	16200	754793
Business services	1492174	488718	552338	1719350	0	0	151129	4403708
Recreatl services	973790	299341	339532	582914	0	0	90097	2285674
Education, health	1778931	1637095	1770771	678579	0	0	-52980	5812395
Dwellings	294201	31909	0	1475381	0	0	55267	1856758
TOTAL	26388612	9359726	5592775	11123343	278672	208824	925075	53877012

Table 3.4 Cost Summary, World, 1997 (percent)

GTAP Sectors	Interm. Usage	Unskilled Labor	Skilled Labor	Capital	Land	Natural Resources	Other Taxes	Total
Paddy rice	33.9	31.2	0.3	11.7	23.3	0.0	-0.4	100
Wheat	44.6	28.2	1.0	14.5	13.5	0.0	-1.8	100
Other grains	41.1	28.6	1.0	15.6	16.0	0.0	-2.4	100
Vegetables, fruit	34.1	32.2	0.8	15.2	17.3	0.0	0.3	100
Oil seeds	33.8	29.3	1.0	17.7	19.2	0.0	-1.0	100
Sugar cane	34.0	29.0	0.8	16.9	19.9	0.0	-0.6	100
Plant-based fibers	51.4	21.7	0.4	9.4	16.3	0.0	0.8	100
Other crops	33.2	32.7	1.3	16.5	15.7	0.0	0.6	100
Cattle, sheep	61.9	18.8	0.8	10.1	8.7	0.0	-0.3	100
Animal products	63.9	18.2	0.5	7.7	9.7	0.0	0.1	100
Raw milk	53.1	23.4	1.0	11.9	11.4	0.0	-0.7	100
Wool	53.8	24.4	0.5	10.8	9.3	0.0	1.2	100
Forestry	35.7	20.9	0.7	35.1	0.0	7.0	0.6	100
Fishing	41.0	16.2	0.5	18.8	0.0	22.7	0.8	100
Coal	37.6	19.3	3.3	15.2	0.0	24.1	0.5	100
Oil	28.7	7.6	2.5	34.1	0.0	24.8	2.4	100
Gas	28.2	7.5	1.9	31.0	0.0	23.0	8.4	100
Other minerals	53.9	14.1	3.8	19.5	0.0	6.5	2.2	100
Cattle, sheep meat	84.1	6.9	1.7	7.3	0.0	0.0	-0.1	100
Other meat	81.5	8.7	2.2	7.6	0.0	0.0	0.0	100
Vegetable oils	78.0	7.4	2.0	12.0	0.0	0.0	0.7	100
Dairy products	75.8	8.5	2.2	14.3	0.0	0.0	-0.9	100
Processed rice	81.3	4.9	1.0	11.8	0.0	0.0	1.0	100
Sugar	74.2	8.3	2.3	15.1	0.0	0.0	0.1	100
Other food	68.8	11.0	3.6	15.5	0.0	0.0	1.1	100
Beverages, tobacco	52.7	8.9	2.9	22.9	0.0	0.0	12.6	100
Textiles	68.9	13.8	3.0	12.3	0.0	0.0	1.9	100
Wearing apparel	64.5	17.0	3.5	12.5	0.0	0.0	2.6	100
Leather products	67.3	15.7	3.0	12.3	0.0	0.0	1.7	100
Wood products	63.7	17.0	4.1	14.2	0.0	0.0	0.9	100
Paper, publishing	59.1	16.2	7.5	15.8	0.0	0.0	1.5	100
Petroleum	89.0	2.2	1.1	6.2	0.0	0.0	1.5	100
Chemicals, rubber	66.8	10.9	5.9	14.9	0.0	0.0	1.6	100
Mineral products	59.6	16.2	5.0	17.0	0.0	0.0	2.3	100
Ferrous metals	73.0	11.9	3.7	9.8	0.0	0.0	1.6	100
Other metals	73.4	11.0	3.6	10.4	0.0	0.0	1.6	100
Metal products	60.5	19.4	6.8	11.7	0.0	0.0	1.6	100

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Table 3.4 Cost Summary, World, 1997 (percent) (Continued)

GTAP Sectors	Interm. Usage	Unskilled Labor	Skilled Labor	Capital	Land	Natural Resources	Other Taxes	Total
Motor vehicles	74.9	11.7	5.4	7.6	0.0	0.0	0.5	100
Transport equipment	62.8	17.5	8.8	9.6	0.0	0.0	1.4	100
Electronic equipt	67.6	12.1	7.7	11.5	0.0	0.0	1.2	100
Machinery, equipt	59.7	15.9	10.0	13.2	0.0	0.0	1.3	100
Other manufactures	62.8	14.5	4.4	16.0	0.0	0.0	2.3	100
Electricity	57.2	6.6	4.4	29.5	0.0	0.0	2.2	100
Gas distribution	42.1	16.3	9.3	28.2	0.0	0.0	4.1	100
Water	38.6	19.5	10.9	28.8	0.0	0.0	2.2	100
Construction	56.5	21.2	7.8	12.9	0.0	0.0	1.5	100
Trade	38.1	26.9	9.4	23.0	0.0	0.0	2.6	100
Other transport	45.8	25.0	8.5	20.0	0.0	0.0	0.6	100
Water transport	67.5	12.9	4.8	13.4	0.0	0.0	1.4	100
Air transport	63.8	17.7	5.4	11.6	0.0	0.0	1.5	100
Communication	34.1	14.0	14.9	35.7	0.0	0.0	1.3	100
Financial services	37.9	15.7	19.1	24.9	0.0	0.0	2.4	100
Insurance	46.0	18.6	20.2	13.1	0.0	0.0	2.1	100
Business services	33.9	11.1	12.5	39.0	0.0	0.0	3.4	100
Recreatl services	42.6	13.1	14.9	25.5	0.0	0.0	3.9	100
Education, health	30.6	28.2	30.5	11.7	0.0	0.0	-0.9	100
Dwellings	15.8	1.7	0.0	79.5	0.0	0.0	3.0	100
TOTAL	49.0	17.4	10.4	20.6	0.5	0.4	1.7	100