

Chapter 5

Data Base Summary: Sectoral Data

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This chapter summarizes sectoral sales and costs data for the world economy as an aggregate in the GTAP 6 Data Base. The regional sectoral data draw heavily on the source input-output tables from varying years (see chapter 11.A). Since the GTAP 6 Data Base was constructed by combining the I-O tables with 2001 macroeconomic data (see chapters 4 and 18.A), the sectoral flows for each region will not be identical to those in the original I-O tables. Thus, sectoral sales and costs 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.

5.1 Disposition of Sales

Tables 5.1 and 5.2 report sales summaries for the world region in all 57 sectors in the GTAP 6 Data Base. Table 5.1 reports this sales information in value terms (millions of 2001 US\$), while table 5.2 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, private consumption, investment, government consumption, and exports. 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 6 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 8 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 61 percent of world sales value. The relative size of each sector is due largely to the 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 5.2 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 other domestic firms (textiles, wood products, pulp and paper, petroleum, chemicals products, mineral products, and metal products), those whose output go directly to domestic consumers and the export market (wearing apparel and leather products), and those which sell to domestic firms for further processing and to the export market (motor vehicles, transport equipment, electronic equipment, machinery and equipment, other manufactures).

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 consumption goods. Electricity services, gas distribution, financial services, and business 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. More than 50 percent of sales of water transport and one-third of air transport sales go to the export market.

5.2 Structure of Sectoral Costs

Table 5.3 reports the structure of sectoral costs in the GTAP 6 Data Base in value terms. That total cost for each sector, as shown in the last column in table 5.3, should equal total sales for each sector (last column in table 5.1) is a requirement that is imposed on the data base. Sectoral costs are composed of payments for intermediate usage, factors of 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.

The primary factor shares in agriculture are based on econometric evidence as documented in chapter 18.C. 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 5.4 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 19 to 35 percent. Skilled labor accounts for a higher share of total cost relative to unskilled labor in several service sectors such as communications, financial services, insurance, business services, recreational services, and education/health services. Total labor (skilled and unskilled) costs share accounts for more than one-third of the costs of trade services, financial services, insurance services, and education/health services.

Capital constitutes 79 percent of the cost of dwellings. Extractive sectors, utility sectors, and some services sectors are also relatively capital-intensive. Capital accounts for more than 25 percent of sectoral costs in the forestry, oil, gas, electricity, gas distribution, water, communication, business services, and recreational services sectors. The cost share of indirect taxes is highest at 11.1 percent in the beverages and tobacco sector. This is followed by the gas sector at 8.3 percent. Domestic support provided to the agricultural sectors in developed countries show up as negative indirect taxes in these sectors.

Table 5.1 Sales Summary, World (2001 US\$ million)

GTAP Sectors	Intermediate	Private	Government		Exports	Total
	Usage	Consumption	Investment	Consumption		
Paddy rice	81417	14995	16	17	2071	98514
Wheat	54319	24853	70	179	16213	95632
Other grains	71037	17699	50	168	13979	102933
Vegetables, fruit	146073	239661	1568	1378	46924	435604
Oil seeds	41565	14027	107	131	15587	71418
Sugar cane	28404	6419	113	17	53	35005
Plant-based fibers	23806	6936	46	602	8267	39657
Other crops	118079	51696	1745	882	39987	212390
Cattle, sheep	118502	23409	2255	34	6127	150327
Animal products	175597	101041	9824	442	15517	302420
Raw milk	124744	42055	3575	657	184	171216
Wool	11250	3391	362	51	2905	17960
Forestry	92509	22832	6345	496	9842	132024
Fishing	59385	76544	303	122	7727	144081
Coal	76226	2064	0	0	21954	100244
Oil	192707	58	1	0	230143	422909
Gas	67563	4761	0	0	58730	131055
Other minerals	204984	1755	1763	161	38157	246820
Cattle, sheep meat	86961	143817	642	2510	21672	255602
Other meat	87145	185426	90	1485	31501	305647
Vegetable oils	69304	48489	197	483	15846	134319
Dairy products	93752	176927	197	4167	29724	304767
Processed rice	23057	100699	13	240	5615	129624
Sugar	65546	55277	55	495	8450	129823
Other food	395300	612649	1180	13318	133826	1156272
Beverages, tobacco	173316	422697	321	558	52327	649219
Textiles	436911	127001	7044	4233	197223	772412
Wearing apparel	78406	268340	1724	3004	160518	511993
Leather products	54845	66195	206	1046	89890	212181
Wood products	320039	105058	59596	4025	123649	612366
Paper, publishing	887220	163832	1972	22288	148222	1223534
Petroleum	495818	138061	4	28	103177	737088
Chemicals, rubber	1620260	350865	11501	34067	704614	2721308
Mineral products	635562	36297	4727	3029	113027	792642
Ferrous metals	679732	677	3021	456	144698	828584
Other metals	332977	1592	2230	337	155694	492828
Metal products	742677	39908	86360	4335	130472	1003752
Motor vehicles	479613	314976	343966	10134	528226	1676915
Transport equipment	140094	46890	74718	44307	206447	512456
Electronic equipt	468704	145808	274197	12066	816967	1717742
Machinery, equipt	814950	136583	562295	68120	1021838	2603786
Other manufactures	215412	161035	50668	7326	184397	618838
Electricity	809625	307091	4	33	24254	1141007
Gas distribution	76267	27369	1	14	2556	106207
Water	121278	78201	213	5489	1506	206687
Construction	739414	41333	3239796	228370	28808	4277722
Trade	2364831	3765476	396504	47027	179835	6753669

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Table 5.1 Sales Summary, World (2001 US\$ million) (Contd)

GTAP Sectors	Intermediate	Private		Government		Total
	Usage	Consumption	Investment	Consumption	Exports	
Other transport	1286296	583801	41393	41907	204925	2158322
Water transport	107876	35673	1801	4613	187365	337329
Air transport	151385	152135	5327	10486	162754	482087
Communication	554527	374927	14060	21546	40931	1005990
Financial services	1553164	544497	39032	34784	54737	2226214
Insurance	325853	443758	313	4184	41941	816050
Business services	3180527	948815	245229	140116	362060	4876746
Recreatl services	902568	1244715	24698	33686	83568	2289234
Education, health	613220	1917580	8183	4235750	107043	6881776
Dwellings	60964	1945886	1700	4938	0	2013488
TOTAL	23933562	16914546	5533317	5060334	7144671	58586420

Table 5.2 Sales Summary, World, 2001 (percent)

GTAP Sectors	Intermediate	Private	Investment	Government	Exports	Total
	Usage	Consumption		Consumption		
Paddy rice	82.6	15.2	0.0	0.0	2.1	100
Wheat	56.8	26.0	0.1	0.2	17.0	100
Other grains	69.0	17.2	0.0	0.2	13.6	100
Vegetables, fruit	33.5	55.0	0.4	0.3	10.8	100
Oil seeds	58.2	19.6	0.1	0.2	21.8	100
Sugar cane	81.1	18.3	0.3	0.0	0.2	100
Plant-based fibers	60.0	17.5	0.1	1.5	20.8	100
Other crops	55.6	24.3	0.8	0.4	18.8	100
Cattle, sheep	78.8	15.6	1.5	0.0	4.1	100
Animal products	58.1	33.4	3.2	0.1	5.1	100
Raw milk	72.9	24.6	2.1	0.4	0.1	100
Wool	62.6	18.9	2.0	0.3	16.2	100
Forestry	70.1	17.3	4.8	0.4	7.5	100
Fishing	41.2	53.1	0.2	0.1	5.4	100
Coal	76.0	2.1	0.0	0.0	21.9	100
Oil	45.6	0.0	0.0	0.0	54.4	100
Gas	51.6	3.6	0.0	0.0	44.8	100
Other minerals	83.0	0.7	0.7	0.1	15.5	100
Cattle, sheep meat	34.0	56.3	0.3	1.0	8.5	100
Other meat	28.5	60.7	0.0	0.5	10.3	100
Vegetable oils	51.6	36.1	0.1	0.4	11.8	100
Dairy products	30.8	58.1	0.1	1.4	9.8	100
Processed rice	17.8	77.7	0.0	0.2	4.3	100
Sugar	50.5	42.6	0.0	0.4	6.5	100
Other food	34.2	53.0	0.1	1.2	11.6	100
Beverages, tobacco	26.7	65.1	0.0	0.1	8.1	100
Textiles	56.6	16.4	0.9	0.5	25.5	100
Wearing apparel	15.3	52.4	0.3	0.6	31.4	100
Leather products	25.8	31.2	0.1	0.5	42.4	100
Wood products	52.3	17.2	9.7	0.7	20.2	100
Paper, publishing	72.5	13.4	0.2	1.8	12.1	100
Petroleum	67.3	18.7	0.0	0.0	14.0	100
Chemicals, rubber	59.5	12.9	0.4	1.3	25.9	100
Mineral products	80.2	4.6	0.6	0.4	14.3	100
Ferrous metals	82.0	0.1	0.4	0.1	17.5	100
Other metals	67.6	0.3	0.5	0.1	31.6	100
Metal products	74.0	4.0	8.6	0.4	13.0	100
Motor vehicles	28.6	18.8	20.5	0.6	31.5	100
Transport equipment	27.3	9.1	14.6	8.6	40.3	100
Electronic equipt	27.3	8.5	16.0	0.7	47.6	100
Machinery, equipt	31.3	5.2	21.6	2.6	39.2	100
Other manufactures	34.8	26.0	8.2	1.2	29.8	100
Electricity	71.0	26.9	0.0	0.0	2.1	100
Gas distribution	71.8	25.8	0.0	0.0	2.4	100
Water	58.7	37.8	0.1	2.7	0.7	100
Construction	17.3	1.0	75.7	5.3	0.7	100
Trade	35.0	55.8	5.9	0.7	2.7	100

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Table 5.2 Sales Summary, World, 2001 (percent) (Contd)

GTAP Sectors	Intermediate	Private	Investment	Government	Exports	Total
	Usage	Consumption		Consumption		
Other transport	59.6	27.0	1.9	1.9	9.5	100
Water transport	32.0	10.6	0.5	1.4	55.5	100
Air transport	31.4	31.6	1.1	2.2	33.8	100
Communication	55.1	37.3	1.4	2.1	4.1	100
Financial services	69.8	24.5	1.8	1.6	2.5	100
Insurance	39.9	54.4	0.0	0.5	5.1	100
Business services	65.2	19.5	5.0	2.9	7.4	100
Recreatl services	39.4	54.4	1.1	1.5	3.7	100
Education, health	8.9	27.9	0.1	61.6	1.6	100
Dwellings	3.0	96.6	0.1	0.2	0.0	100
TOTAL	40.9	28.9	9.4	8.6	12.2	100

Table 5.3 Cost Summary, World (2001 US\$ million)

GTAP Sectors	Interm. Unskilled		Skilled		Land	Natural Resources	Other Taxes	Total
	Usage	Labor	Labor	Capital				
Paddy rice	30121	33742	366	12403	23628	0	-1746	98514
Wheat	50659	23067	639	10545	12723	0	-2000	95632
Other grains	51414	26019	863	12908	13545	0	-1816	102933
Vegetables, fruit	137390	154809	3346	59163	77445	0	3451	435604
Oil seeds	28787	21142	657	12101	14808	0	-6077	71418
Sugar cane	13013	10005	233	5188	6783	0	-217	35005
Plant-based fibers	20445	9212	220	4710	5918	0	-848	39657
Other crops	77540	66413	2601	33295	35075	0	-2535	212390
Cattle, sheep	88725	30080	1145	16103	13086	0	1188	150327
Animal products	187420	57872	1305	21799	30882	0	3142	302420
Raw milk	97129	36328	1379	17564	19898	0	-1082	171216
Wool	10918	3623	72	1456	1788	0	102	17960
Forestry	49696	33239	925	38056	0	9169	940	132024
Fishing	59012	25254	733	25160	0	32737	1185	144081
Coal	42373	16501	2860	14876	0	22968	667	100244
Oil	173784	23291	7326	109689	0	94402	14417	422909
Gas	40069	6166	1771	43104	0	29076	10868	131055
Other minerals	139774	32206	8718	44660	0	15627	5836	246820
Cattle, sheep meat	196104	28662	6367	24271	0	0	198	255602
Other meat	236257	29967	7247	31394	0	0	783	305647
Vegetable oils	101598	9961	2832	19207	0	0	721	134319
Dairy products	224509	29837	7659	43981	0	0	-1218	304767
Processed rice	100940	10480	2091	16162	0	0	-50	129624
Sugar	93695	13254	4056	18003	0	0	815	129823
Other food	788007	130136	43420	182983	0	0	11727	1156272
Beverages, tobacco	361666	51902	17711	146188	0	0	71752	649219
Textiles	539490	104736	22796	87572	0	0	17818	772412
Wearing apparel	332096	89142	18403	58155	0	0	14197	511993
Leather products	148809	29119	5703	23935	0	0	4616	212181
Wood products	389947	101392	25399	87851	0	0	7777	612366
Paper, publishing	729756	193056	91568	189977	0	0	19178	1223534
Petroleum	666657	11086	4707	31289	0	0	23349	737088
Chemicals, rubber	1838018	281182	159651	399393	0	0	43064	2721308
Mineral products	489245	121491	36938	126497	0	0	18471	792642
Ferrous metals	618069	95005	29468	73827	0	0	12216	828584
Other metals	374540	49148	15835	46082	0	0	7223	492828
Metal products	617312	187925	66706	114983	0	0	16827	1003752
Motor vehicles	1266680	187683	89508	127023	0	0	6020	1676915
Transport equipment	324364	87803	43303	50824	0	0	6162	512456
Electronic equipt	1167943	198945	124196	206212	0	0	20446	1717742
Machinery, equipt	1588170	391229	257159	337344	0	0	29884	2603786
Other manufactures	375667	95876	28289	105496	0	0	13510	618838
Electricity	559337	92064	60677	385451	0	0	43478	1141007
Gas distribution	50704	12041	7142	33252	0	0	3067	106207
Water	85228	39318	22150	55458	0	0	4533	206687
Construction	2399889	921179	328913	561261	0	0	66481	4277722
Trade	2577937	1864473	630718	1476754	0	0	203790	6753669

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Table 5.3 Cost Summary, World (2001 US\$ million) (Contd)

GTAP Sectors	Interm. Unskilled		Skilled		Land	Natural Resources	Other Taxes	Total
	Usage	Labor	Labor	Capital				
Other transport	1067631	465589	160825	443677	0	0	20601	2158322
Water transport	218116	47739	17261	48713	0	0	5500	337329
Air transport	297882	87299	26219	61168	0	0	9519	482087
Communication	377222	130313	142279	340756	0	0	15420	1005990
Financial services	885756	341928	431624	516796	0	0	50109	2226214
Insurance	430916	134384	163632	69353	0	0	17765	816050
Business services	1733195	539096	635137	1814199	0	0	155119	4876746
Recreatl services	954663	309953	359836	578529	0	0	86254	2289234
Education, health	1985427	1978303	2103347	854957	0	0	-40258	6881776
Dwellings	298292	75362	0	1588705	0	0	51129	2013488
TOTAL	28790010	10177022	6235925	11860457	255579	203978	1063464	58586420

Table 5.4 Cost Summary, World, 2001 (percent)

GTAP Sectors	Interm. Usage	Unskilled Labor	Skilled Labor	Capital	Land	Natural Resources	Other Taxes	Total
Paddy rice	30.6	34.3	0.4	12.6	24.0	0.0	-1.8	100
Wheat	53.0	24.1	0.7	11.0	13.3	0.0	-2.1	100
Other grains	49.9	25.3	0.8	12.5	13.2	0.0	-1.8	100
Vegetables, fruit	31.5	35.5	0.8	13.6	17.8	0.0	0.8	100
Oil seeds	40.3	29.6	0.9	16.9	20.7	0.0	-8.5	100
Sugar cane	37.2	28.6	0.7	14.8	19.4	0.0	-0.6	100
Plant-based fibers	51.6	23.2	0.6	11.9	14.9	0.0	-2.1	100
Other crops	36.5	31.3	1.2	15.7	16.5	0.0	-1.2	100
Cattle, sheep	59.0	20.0	0.8	10.7	8.7	0.0	0.8	100
Animal products	62.0	19.1	0.4	7.2	10.2	0.0	1.0	100
Raw milk	56.7	21.2	0.8	10.3	11.6	0.0	-0.6	100
Wool	60.8	20.2	0.4	8.1	10.0	0.0	0.6	100
Forestry	37.6	25.2	0.7	28.8	0.0	6.9	0.7	100
Fishing	41.0	17.5	0.5	17.5	0.0	22.7	0.8	100
Coal	42.3	16.5	2.9	14.8	0.0	22.9	0.7	100
Oil	41.1	5.5	1.7	25.9	0.0	22.3	3.4	100
Gas	30.6	4.7	1.4	32.9	0.0	22.2	8.3	100
Other minerals	56.6	13.0	3.5	18.1	0.0	6.3	2.4	100
Cattle, sheep meat	76.7	11.2	2.5	9.5	0.0	0.0	0.1	100
Other meat	77.3	9.8	2.4	10.3	0.0	0.0	0.3	100
Vegetable oils	75.6	7.4	2.1	14.3	0.0	0.0	0.5	100
Dairy products	73.7	9.8	2.5	14.4	0.0	0.0	-0.4	100
Processed rice	77.9	8.1	1.6	12.5	0.0	0.0	0.0	100
Sugar	72.2	10.2	3.1	13.9	0.0	0.0	0.6	100
Other food	68.2	11.3	3.8	15.8	0.0	0.0	1.0	100
Beverages, tobacco	55.7	8.0	2.7	22.5	0.0	0.0	11.1	100
Textiles	69.8	13.6	3.0	11.3	0.0	0.0	2.3	100
Wearing apparel	64.9	17.4	3.6	11.4	0.0	0.0	2.8	100
Leather products	70.1	13.7	2.7	11.3	0.0	0.0	2.2	100
Wood products	63.7	16.6	4.1	14.3	0.0	0.0	1.3	100
Paper, publishing	59.6	15.8	7.5	15.5	0.0	0.0	1.6	100
Petroleum	90.4	1.5	0.6	4.2	0.0	0.0	3.2	100
Chemicals, rubber	67.5	10.3	5.9	14.7	0.0	0.0	1.6	100
Mineral products	61.7	15.3	4.7	16.0	0.0	0.0	2.3	100
Ferrous metals	74.6	11.5	3.6	8.9	0.0	0.0	1.5	100
Other metals	76.0	10.0	3.2	9.4	0.0	0.0	1.5	100
Metal products	61.5	18.7	6.6	11.5	0.0	0.0	1.7	100
Motor vehicles	75.5	11.2	5.3	7.6	0.0	0.0	0.4	100
Transport equipment	63.3	17.1	8.5	9.9	0.0	0.0	1.2	100
Electronic equipt	68.0	11.6	7.2	12.0	0.0	0.0	1.2	100
Machinery, equipt	61.0	15.0	9.9	13.0	0.0	0.0	1.1	100
Other manufactures	60.7	15.5	4.6	17.0	0.0	0.0	2.2	100
Electricity	49.0	8.1	5.3	33.8	0.0	0.0	3.8	100
Gas distribution	47.7	11.3	6.7	31.3	0.0	0.0	2.9	100
Water	41.2	19.0	10.7	26.8	0.0	0.0	2.2	100
Construction	56.1	21.5	7.7	13.1	0.0	0.0	1.6	100
Trade	38.2	27.6	9.3	21.9	0.0	0.0	3.0	100

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Table 5.4 Cost Summary, World, 2001 (percent) (Contd)

GTAP Sectors	Interm. Usage	Unskilled Labor	Skilled Labor	Capital	Land	Natural Resources	Other Taxes	Total
Other transport	49.5	21.6	7.5	20.6	0.0	0.0	1.0	100
Water transport	64.7	14.2	5.1	14.4	0.0	0.0	1.6	100
Air transport	61.8	18.1	5.4	12.7	0.0	0.0	2.0	100
Communication	37.5	13.0	14.1	33.9	0.0	0.0	1.5	100
Financial services	39.8	15.4	19.4	23.2	0.0	0.0	2.3	100
Insurance	52.8	16.5	20.1	8.5	0.0	0.0	2.2	100
Business services	35.5	11.1	13.0	37.2	0.0	0.0	3.2	100
Recreatl services	41.7	13.5	15.7	25.3	0.0	0.0	3.8	100
Education, health	28.9	28.7	30.6	12.4	0.0	0.0	-0.6	100
Dwellings	14.8	3.7	0.0	78.9	0.0	0.0	2.5	100
TOTAL	49.1	17.4	10.6	20.2	0.4	0.3	1.8	100