

### **1. *Introduction***

This chapter describes the procedure and considerations underlying the construction of the Korean input-output (I-O) table for the Global Trade Analysis Project (GTAP) database version 10. The document is organized as follows. Section 2 provides a short description of general characteristics of the Korean I-O table. Section 3 shows how the Korean I-O table is mapped to the GTAP concordance. Section 4 explains how negative values in the initial Korean I-O table are adjusted and Section 5 shows how commodity taxes on domestic products and imports are calculated. In the final section, information not available from the Korean I-O table is mentioned.

### **2. *Data source***

The Korean I-O table used for the GTAP database version 10 was compiled by the Bank of Korea in Seoul (The Bank of Korea, 2016). The reference year of the Korean I-O table is 2014 and the unit of accounts is Korean million won (KRW). The Korean I-O table for 2014 is grouped commodity by commodity and includes 384 commodities. It was generated by multiplying the supply table consisting of 384 commodities and 328 industries by the use table consisting of 328 industries and 384 commodities, as the Korean I-O table for 2010 was done.<sup>2</sup>

The Korean I-O table includes three different tables: a transaction table of domestically produced goods and services, a transaction table of imported goods and services and a transaction table of composite goods and services composed of domestic and imported goods and services. These three tables<sup>3</sup> are evaluated at basic prices only.<sup>4</sup>

The matrix of final demand in the transaction table of domestic products and the matrix of final demand of the transaction table of imports include private consumption, government expenditure, private

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<sup>1</sup>The author appreciates Angel Aguiar's kind support for splitting sector 35 (slaughtering and meat processing) of the Korean I-O table into sector 19 (cmt) and sector 20 (omt) of the GTAP database and fixing tariffs.

<sup>2</sup>The Korean I-O table for 2010 used for the GTAP database version 9 is the first Korean I-O table generated using the supply and use tables compiled in compliance with the system of national accounts (SNA) of 2008. In other words, the supply and use tables were first compiled based on the SNA (2008), and the Korean I-O table for 2010 was calculated by multiplying the supply table by the use table.

<sup>3</sup>The supply table is evaluated at basic prices and there are the use tables evaluated at purchaser prices and basic prices.

<sup>4</sup>The Korean I-O tables for 2010 used for the GTAP database version 9 were evaluated at three different prices: purchaser prices, producer prices, and basic prices. The differences between the transaction table of domestic goods and services at purchaser prices and the transaction table of domestic goods and services at producer prices are trade margins and transportation costs. The differences between the transaction table of domestic products at producer prices and the transaction table of domestic products at basic prices are net commodity tax on products.

fixed capital formation, government fixed capital formation, change in stocks, acquisition less disposal of valuables, and exports.<sup>5</sup> Acquisition less disposal of valuables was added to private consumption to get a vector of household consumption of domestic products and a vector of household consumption of imports. Government fixed capital formation was added to private fixed capital formation to get a vector of investment usage of domestic products and a vector of investment usage of imports.

The matrix of value added in the transaction table of composite goods at basic prices includes compensation of employees, operating surplus, depreciation of fixed capital, and net indirect taxes (less subsidies). Depreciation of fixed capital was added to operating surplus to obtain a vector of employment of capital. Subsidies were subtracted from indirect taxes to get a vector of net non-commodity indirect taxes.

### ***3. Mapping the Korean I-O table to the GTAP sectoral classification***

Table A.1 in the appendix shows how 384 sectors of the Korean I-O table are mapped to the GTAP sectoral classification (GSC2). The Korean I-O table does not include sugar cane and sugar beet (sector 6 of the GTAP data base) and includes 7 sectors which should be split into more than one sector of the GTAP data base: sector 2 (wheat and other crops), sector 18 (other livestock breeding), sector 25 (agriculture, forestry and fishing services), sector 35 (slaughtering and meat processing), sector 42 (polished rice, barley and others), sector 50 (animal and vegetable fats and oils), and sector 340 (services auxiliary to finance and insurance) of the Korean I-O table.

Sector 2 (wheat and other crops<sup>6</sup>) of the Korean I-O table includes wheat and other crops and is split into sector 2 (wheat) and sector 3 (cereal grains nec) of the GSC2, as seen in Tables 1 and 2. The \* signifies the Korean I-O table sector affected by the split. 33.92 percent and 66.08 percent of sector 2 (wheat and other crops) of the Korean I-O table were assigned to sector 2 (wheat) and sector 3 (cereal grains nec) of the GSC2, respectively, as shown in Table 2<sup>7</sup>.

**Table 1. Splits of sector 2 (wheat and other crops) of the Korean I-O table in accordance with GSC2**

<b>GTAP (GSC2)</b>	<b>Korean I-O table</b>
<b>02 Wheat</b>	2* Wheat and other crops
<b>03 Cereal grains nec</b>	2* Wheat and other crops

<sup>5</sup> The transaction table of imports does not include a column of exports.

<sup>6</sup> Wheat was sector 3 of the Korean I-O table for 2007 used for GTAP database version 8, which includes 403 sectors, whereas wheat is part of sector 2 (wheat and other crops) of the Korean I-O table for 2010 used for GTAP database version 9 and the Korean I-O table for 2014 used for GTAP database version 10.

<sup>7</sup> The data required to calculate the splits are based on the data on supplies of domestic and imported goods by commodity and sector attached to the Korean I-O tables for 2010, because such data are not available in the Korean I-O tables for 2014.

**Table 2. Shares of components of sector 2 (wheat and other crops) of the Korean I-O table**

<b>Commodity</b>	<b>Domestic production (mil. won)</b>	<b>Imports (mil. won)</b>	<b>Total supply (mil. won)</b>	<b>Share (%)</b>
<b>Wheat</b>	34,216	1,241,547	1,275,763	33.92
<b>Other crops</b>	158,892	2,325,913	2,484,805	66.08
<b>Total</b>	193,108	3,567,460	3,760,568	100

Sector 18 (other livestock breeding) of the Korean I-O table is split into sector 9 (bovine cattle, sheep and goats, horses), sector 10 (animal products nec), and sector 12 (wool, silk-worm cocoons) of the GSC2. The splits of sector 18 (other livestock breeding) of the Korean I-O table are presented in Tables 3 and 4. The splitting of sector 18 of the Korean I-O tables (the transaction tables of domestic products and imports) were done using the shares of total supply consisting of domestic output and imports of goats, goat milk, deer, antlers of the deer, other livestock, honey, nectar, dog, rabbit, other livestock products, fur, green skin and pelt, silk-worm cocoons, and by-products.

**Table 3. Splits of sector 18 (other livestock breeding) of the Korean I-O table in accordance with GSC2**

<b>GTAP (GSC2)</b>	<b>Korean I-O table</b>
<b>09 Bovine cattle, sheep and goats, horses</b>	15 Beef cattle
	18* Other livestock breeding
<b>10 Animal products nec</b>	16 Swine
	17 Poultry and eggs
	18* Other livestock breeding
<b>12 Wool, silk-worm cocoons</b>	18* Other livestock breeding

21.66 percent, 55.42 percent and 22.92 percent of sector 18 (other livestock breeding) of the Korean I-O table were assigned to sector 9 (bovine cattle, sheep and goats, horses), sector 10 (animal products nec), and sector 12 (wool, silk-worm cocoons) of the GSC2, respectively, as shown in Table 4.

**Table 4. Shares of components of sector 18 (other livestock breeding) of the Korean I-O table**

<b>Commodity</b>	<b>Domestic production (mil. won)</b>	<b>Imports (mil. won)</b>	<b>Total supply (mil. won)</b>	<b>Share (%)</b>
<b>Goats</b>	50,245	0	50,245	4.86
<b>Goat milk</b>	47,890	0	47,890	4.64
<b>Deer</b>	23,051	0	23,051	2.23
<b>Antlers of the deer</b>	72,980	28,035	101,015	9.78
<b>Other livestock</b>	532	1,050	1,582	0.15
<b>Subtotal</b>	194,698	29,085	223,783	21.66
<b>Honey</b>	433,193	3,549	436,742	42.28
<b>Nectar</b>	59,597	7,404	67,001	6.49
<b>Dog</b>	0	2,308	2,308	0.22
<b>Rabbit</b>	14,834	107	14,941	1.45
<b>Other livestock products</b>	15,957	35,568	51,525	4.99
<b>Subtotal</b>	523,581	48,936	572,517	55.42
<b>Fur</b>	292	73,295	73,587	7.12
<b>Green skin and pelt</b>	0	142,154	142,154	13.76
<b>Silk-worm cocoons</b>	5,630	965	6,595	0.64
<b>By-products</b>	9,193	5,235	14,428	1.4
<b>Subtotal</b>	15,115	221,649	236,764	22.92
<b>Total</b>	733,394	299,670	1,033,064	100

Sector 25 (agriculture, forestry and fishing services) of the Korean I-O table is split into sectors 1-14 of the GSC2, as shown in Table 5. The splitting of sector 25 of the Korean I-O table was done using the shares of domestic output of sectors 1-24 of the Korean I-O table, as presented in Table 6.

**Table 5. Splits of sector 25 (agriculture, forestry and fishing services) of the Korean I-O table in accordance with GSC2**

<b>GTAP (GSC2)</b>	<b>Korean I-O table</b>
<b>01 Paddy rice</b>	01 Unmilled rice
	25* Agriculture, forestry and fishing services
<b>02 Wheat</b>	02* Wheat and other crops
	25* Agriculture, forestry and fishing services
<b>03 Cereal grains nec</b>	02* Wheat and other crops
	25* Agriculture, forestry and fishing services
<b>04 Vegetables, fruit, nuts</b>	05 Vegetables
	06 Fruits
	03 Pulses
	25* Agriculture, forestry and fishing services
<b>05 Oil seeds</b>	12 Seeds and seedlings
	25* Agriculture, forestry and fishing services
<b>06 Sugar cane, sugar beet</b>	44 Raw sugar
<b>07 Plant-based fibers</b>	13 Other inedible crops
	25* Agriculture, forestry and fishing services
<b>08 Crops nec</b>	04 Potatoes
	07 Cultivated medicinal herbs
	08 Other edible crops
	09 Leaf tobacco
	10 Ornamental floriculture
	11 Natural rubber
	25* Agriculture, forestry and fishing services
<b>09 Bovine cattle, sheep and goats, horses</b>	15 Beef cattle
	18* Other livestock breeding
	25* Agriculture, forestry and fishing services
<b>10 Animal products nec</b>	16 Swine
	17 Poultry and eggs
	18* Other livestock breeding
	25* Agriculture, forestry and fishing services
<b>11 Raw milk</b>	14 Dairy farming
	25* Agriculture, forestry and fishing services
<b>12 Wool, silk-worm cocoons</b>	18* Other livestock breeding
	25* Agriculture, forestry and fishing services
<b>13 Forestry</b>	19 Forest planting and conservation
	20 Raw timber
	21 Edible forestry products
	22 Misc. forestry products
	25* Agriculture, forestry and fishing services
<b>14 Fishing</b>	23 Fishing
	24 Aquaculture
	25* Agriculture, forestry and fishing services

**Table 6. Shares of sectors 1-24 of the Korean I-O table for the split of sector 25 (agriculture, forestry and fishing services) of the Korean I-O table**

<b>GTAP (GSC2)</b>	<b>Korean I-O table</b>	<b>Domestic production (mil. won)</b>	<b>Share (%)</b>
<b>01 pdr</b>	01 Unmilled rice	6,970,742	13.51
<b>02 wht</b>	02* Wheat and other crops	65,502	0.13
<b>03 gro</b>	02* Wheat and other crops	127,606	0.25
<b>04 v_f</b>	05 Vegetables	9,297,279	18.03
	06 Fruits	3,580,672	6.94
	03 Pulses	562,846	1.09
<b>05 osd</b>	12 Seeds and seedlings	47,797	0.09
<b>06 c_b</b>	Not existent	0	0
<b>07 pfb</b>	13 Other inedible crops	3,703	0.01
<b>08 ocr</b>	04 Potatoes	534,630	1.04
	07 Cultivated medicinal herbs	2,015,550	3.91
	08 Other edible crops	349,233	0.68
	09 Leaf tobacco	92,677	0.18
	10 Ornamental floriculture	1,535,706	2.98
	11 Natural rubber	0	0
	<b>09 ctl</b>	15 Beef cattle	4,701,208
	18* Other livestock breeding	158,853	0.31
<b>10 oap</b>	16 Swine	4,863,727	9.43
	17 Poultry and eggs	4,660,846	9.04
	18* Other livestock breeding	406447	0.79
<b>11 rmk</b>	14 Dairy farming	1,806,517	3.5
<b>12 wol</b>	18* Other livestock breeding	168,094	0.33
<b>13 for</b>	19 Forest planting and conservation	707,230	1.37
	20 Raw timber	259,619	0.5
	21 Edible forestry products	1,140,732	2.21
	22 Misc. forestry products	100,700	0.2
	<b>14 fsh</b>	23 Fishing	5,343,287
	24 Aquaculture	2,077,930	4.03
<b>Total</b>		51,579,133	100

Sector 35 (slaughtering and meat processing) of the Korean I-O table is split into sector 19 (bovine cattle, sheep and goats, horse meat products) and sector 20 (meat products nec) of the GSC2, as shown in Tables 7 and 8. Sector 50 (animal and vegetable fats and oils) of the Korean I-O table is split into sector 20 (meat products nec) and sector 21 (vegetable oils and fats) of the GSC2, as shown in Tables 7 and 9.

**Table 7. Splits of sector 35 (slaughtering and meat processing) and sector 50 (animal and marine fats and oils) of the Korean I-O table in accordance with GSC2**

GTAP (GSC2)	Korean I-O table
<b>19 Bovine cattle, sheep and goats, horse meat products</b>	35* Slaughtering and meat processing
<b>20 Meat products nec</b>	35* Slaughtering and meat processing
	36 Poultry slaughtering and processing
	37 Prepared meat products
	50* Animal and vegetable fats and oils
<b>21 Vegetable oils and fats</b>	50* Animal and vegetable fats and oils

**Table 8. Shares of components of sector 35 (slaughtering and meat processing) of the Korean I-O table**

Commodity	Domestic production (mil. won)	Imports (mil. won)	Total supply (mil. won)	Share (%)
<b>Slaughtered meat</b>	0	11,288	11,288	0.06
<b>Beef</b>	5,072,722	1,243,291	6,316,013	32.87
<b>Other slaughtered meat</b>	292	21,562	21,854	0.11
<b>Subtotal</b>	5,073,014	1,276,141	6,349,155	<b>33.04</b>
<b>Pig meat</b>	5,275,676	768,563	6,044,239	31.46
<b>Green skin</b>	34,764	468,685	503,449	2.62
<b>Other by-products</b>	87,415	224,196	311,611	1.62
<b>Chicken</b>	2,450,111	183,341	2,633,452	13.71
<b>Poultry except chicken</b>	637,000	5,374	642,374	3.34
<b>Poultry by-products</b>	150,565	52,231	202,796	1.06
<b>Ham and bacon</b>	708,071	4,941	713,012	3.71
<b>Sausage</b>	482,356	24,272	506,628	2.64
<b>Canned meat products</b>	13,424	14,073	27,497	0.14
<b>Poultry processed products</b>	386,680	63,558	450,238	2.34
<b>Other processed meat products</b>	815,195	14,309	829,504	4.32
<b>Subtotal</b>	11,041,257	1,823,543	12,864,800	<b>66.96</b>
<b>Total</b>	16,114,271	3,099,684	19,213,955	100

The splitting of sector 35 of the Korean I-O table were done using the shares of total supply consisting of domestic output and imports of slaughtered meat, beef, other slaughtered meat, pig meat, green skin, other by-products, chicken, poultry except chicken, poultry by-products, ham and bacon, sausage, canned meat products, poultry processed products, and other processed meat products, as shown in Table 8. 33.04 percent and 66.96 percent of sector 35 (slaughtering and meat processing) of the Korean I-O table were assigned to sector 19 (bovine cattle, sheep and goats, horse meat products) and sector 20 (meat products nec) of the GSC2, respectively.

**Table 9. Shares of components of sector 50 (animal and vegetable fats and oils) of the Korean I-O table**

<b>Commodity</b>	<b>Domestic production (mil. won)</b>	<b>Imports (mil. won)</b>	<b>Total supply (mil. won)</b>	<b>Share (%)</b>
<b>Edible animal fats</b>	114,700	0	114,700	2.52
<b>Inedible animal fats</b>	35,188	78,098	113,286	2.49
<b>Fish fats</b>	5,107	24,289	29,396	0.65
<b>Animal oil cake</b>	165,059	0	165,059	3.63
<b>Subtotal</b>	<b>320,054</b>	<b>102,387</b>	<b>422,441</b>	<b>9.28</b>
<b>Sesame oil</b>	266,149	1,905	268,054	5.89
<b>Perilla oil</b>	31,685	1,834	33,519	0.74
<b>Raw corn oil</b>	14,762	444	15,206	0.33
<b>Rapeseed oil</b>	27,251	391	27,642	0.61
<b>Other vegetable oils</b>	46,092	441,775	487,867	10.72
<b>Soy bean oil</b>	537,567	338,107	875,674	19.23
<b>Corn oil</b>	69,720	185	69,905	1.54
<b>Olive oil</b>	26,450	43,282	69,732	1.53
<b>Other edible refined oil</b>	597,640	284,034	881,674	19.37
<b>Margarine</b>	81,542	3,763	85,305	1.87
<b>Shortening</b>	101,800	3,699	105,499	2.32
<b>Other oils</b>	37,714	21,860	59,574	1.31
<b>Other vegetable oil cake</b>	344,801	805,775	1,150,576	25.27
<b>Subtotal</b>	<b>2,183,173</b>	<b>1,947,054</b>	<b>4,130,227</b>	<b>90.72</b>
<b>Total</b>	<b>2,503,227</b>	<b>2,049,441</b>	<b>4,552,668</b>	<b>100</b>

The splitting of sector 50 of the Korean I-O table were done using the shares of total supply consisting of domestic output and imports of edible animal fats, inedible animal fats, fish fats, animal oil cake, sesame oil, perilla oil, raw corn oil, rapeseed oil, other vegetable oils, soy bean oil, corn oil, olive oil, other edible refined oil, margarine, shortening, other oils, and other vegetable oil cake, as shown in Table 9. 9.28 percent and 90.72 percent of sector 50 (animal and vegetable fats and oils) of the Korean I-O table were assigned to sector 20 (meat products nec) and sector 21 (vegetable oils and fats) of the GSC2, respectively.

Sector 42 (polished rice, barley and others) of the Korean I-O table is split into sector 23 (processed rice) and sector 25 (food products nec) of the GSC2, as shown in Tables 10 and 11. The splitting of sector 42 of the Korean I-O table were done using the shares of total supply consisting of domestic output and imports of processed rice, processed barley, other processed grains, and processed by-products, as seen in Table 11. 95.53 percent and 4.47 percent of sector 42 (polished rice, barley and others) of the Korean I-O table were assigned to sector 23 (processed rice) and sector 25 (food products nec) of the GSC2, respectively.

Sector 340 (services auxiliary to finance and insurance) of the Korean I-O table is split into sector 52 (financial services nec) and sector 53 (insurance) of the GTAP database, as shown in Table 12. Shares of the splits of sector 340 are presented in Table 13. 77.03 percent and 22.97 percent of domestic production of sector 340 were assigned to sector 52 (financial services nec) and sector 53 (insurance), respectively.



**Table 10. Splits of sector 42 (polished rice, barley and others) of the Korean I-O table in accordance with GSC2**

<b>GTAP (GSC2)</b>	<b>Korean I-O table</b>
<b>23 Processed rice</b>	42* Polished rice, barley and others
<b>25 Food products nec</b>	42* Polished rice, barley and others
	40 Processed fish and sea foods
	41 Frozen, salted, dried and smoked fish and sea foods
	43 Flour and cereal preparations
	46 Starches, glucose, glucose syrup and maltose
	47 Bakery and confectionery products
	48 Noodles
	49 Seasonings
	51 Canned or cured fruits and vegetables
	52 Coffee and tea
	53 Ginseng products
	54 Miscellaneous foodstuffs
	55 Prepared livestock feeds

**Table 11 Shares of components of 42 (polished rice, barley and others) of the Korean I-O table**

<b>Commodity</b>	<b>Domestic production (mil. won)</b>	<b>Imports (mil. won)</b>	<b>Total supply (mil. won)</b>	<b>Share (%)</b>
<b>Processed rice</b>	6,787,222	286,240	7,073,462	95.53
<b>Processed barley</b>	66,185	0	66,185	0.89
<b>Other processed grains</b>	237,623	48	237,671	3.21
<b>Processed by-products</b>	21,291	5,880	27,171	0.37
<b>Subtotal</b>	325,099	5,928	331,027	4.47
<b>Total</b>	7,112,321	292,168	7,404,489	100

**Table 12. Splits of sector 340 (services auxiliary to finance and insurance) of the Korean I-O table in consistence with GSC2**

<b>GTAP (GSC2)</b>	<b>Korean I-O table</b>
<b>52 Financial services nec</b>	335 Central bank and banking institutions
	336 Financial investment institutions
	337 Other financial intermediaries
	340* Services auxiliary to finance and insurance
<b>53 Insurance</b>	338 Life insurance
	339 Casualty insurance
	340* Services auxiliary to finance and insurance

**Table 13. Shares of the splits of sector 340 (services auxiliary to finance and insurance) of the Korean I-O table**

<b>Sector</b>	<b>Domestic production (mil. won)</b>	<b>Share (%)</b>
<b>Securities organizations</b>	10,371,829	66.66
<b>Other financial organizations</b>	916,026	5.89
<b>Financial holding companies</b>	447,571	2.88
<b>Non-financial holding companies</b>	26,488	0.17
<b>The Financial Supervisory Service</b>	222,986	1.43
<b>Subtotal</b>	11,984,900	77.03
<b>Insurance agents and brokers</b>	3,369,304	21.65
<b>Insurance appraisal</b>	204,882	1.32
<b>Subtotal</b>	3,574,186	22.97
<b>Total</b>	12,207,886	100

Sector 341 (residential services) of the Korean I-O table is split into sectors 54 (obs) and 57 (dwe) of GSC2. According to the Korean Statistical Information Service (2016), 56 percent and 46 percent of sector 341 (residential services) were allocated to sector 57 (dwe) and sector 54 (obs), respectively.

#### ***4. Adjustment of negative values***

There were some negative values in the intermediate usage of domestic products, household consumption of domestic products, and investment usage of domestic products in the Korean I-O tables used for the previous versions 5 (Ko and Cheong, 2002), 6 (Ko, 2006), 7 (Ko, 2008), and 8 (Ko, 2012) of the GTAP databases, while there is no negative value in the intermediate usage of domestic products, household consumption of domestic products, and investment usage of domestic products in the Korean I-O tables used for GTAP database versions 9 and 10. It is because a ‘new’ row vector of scraps including negative values is introduced in the Korean I-O tables used for GTAP database versions 9 and 10, which does not belong to either the matrix of intermediate inputs or the matrix of value-added. The negative values of the vector of scraps were set to zeroes and the sectoral balance was restored by adjusting “non-commodity indirect taxes in the matrix of value added”.

There are negative values of operating surplus in the Korean I-O table for 2014: sector 26 (anthracite), sector 256 (steel ships), sector 257 (other ships), sector 304 (railroad passenger transportation), and sector 305 (railroad freight transportation), sector 309 (coastal and inland water transportation), sector 310 (deep sea transportation), and sector 311 (air transportation).

Before correcting the negative values, 384 sectors of the Korean I-O table were aggregated into 57 sectors in concordance with the GTAP sectoral classification (GSC2). Then, the still offending cells in operating surplus were set to zeroes and the sectoral balance was restored by adjusting “non-commodity indirect taxes”.

## ***5. Calculating commodity taxes on domestic products and imports***

Commodity tax on intermediate usage of domestic products, by commodity and commodity (AI16) was calculated from a row vector of net commodity taxes on domestic intermediate inputs<sup>8</sup>. Commodity tax on household consumption of domestic products, by commodity (AI18)<sup>9</sup>, commodity tax on investment usage of domestic products, by commodity (AI20), commodity tax on government usage of domestic products, by commodity (AI22), and commodity tax on change in stocks of domestic products, by commodity (AI25) were computed from a scalar of total net commodity taxes on domestic goods for each of them.

Commodity tax on intermediate usage of imports, by commodity and commodity (AI17) was calculated from a row vector of net commodity taxes on imported intermediate inputs<sup>10</sup>. Commodity tax on household consumption of imported products, by commodity (AI19)<sup>11</sup>, commodity tax on investment usage of imported products, by commodity (AI21), commodity tax on government usage of imported products, by commodity (AI23), and commodity tax on change in stocks of imported products, by commodity (AI26) were computed from a scalar of total net commodity taxes on imported goods for each of them.

Commodity tax on government consumption of domestic products, by commodity (AI22), commodity tax on government consumption of imports, by commodity (AI23), commodity tax on exports, by commodity (AI24) are zeroes in the Korean I-O table.

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<sup>8</sup> In the case of the Korean I-O table for 2010 used for GTAP database version 9, the matrix of commodity tax on intermediate usage of domestic products (AI16) was calculated by subtracting the matrix of intermediate usage of domestic products (AI01) at basic prices from the matrix of intermediate usage of domestic products (AI01) at producer prices.

<sup>9</sup> In the case of the Korean I-O table for 2010 used for GTAP database version 9, AI18, AI20, AI22, and AI25 were calculated by subtracting the corresponding vector of domestic products at basic prices from the corresponding vector of domestic products at producer prices. For example, the vector of commodity tax on household consumption of domestic products (AI18) was calculated by subtracting the vector of household consumption of domestic products (AI05) at basic prices from the vector of household consumption of domestic products (AI05) at producer prices.

<sup>10</sup> In the case of the Korean I-O table for 2010 used for GTAP database version 9, the matrix of commodity tax on intermediate usage of imported products (AI17) was calculated by subtracting the matrix of intermediate usage of imported products (AI02) at basic prices from the matrix of intermediate usage of imported products (AI02) at producer prices.

<sup>11</sup> In the case of the Korean I-O table for 2010 used for GTAP database version 9, AI19, AI21, AI23, and AI26 were calculated by subtracting the corresponding vector of imported products at basic prices from the corresponding vector of imported products at producer prices. For example, the vector of commodity tax on household consumption of imported products (AI19) was calculated by subtracting the vector of household consumption of imported products (AI06) at basic prices from the vector of household consumption of imported products (AI06) at producer prices.

## **6. *Information not available from the Korean I-O table***

Of the information mentioned in Table 2 of GTAP Technical Paper No. 1, “Contributing Input-Output Tables to the GTAP Data Base”, Release 4.2, January 2000, only employment of land, by industry (AI15) is not available from the Korean I-O table. This array is filled with zeroes.

## *References*

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## Appendix

**Table A.1 A Mapping of 384 Sectors of Korean I-O Table to GTAP Sectoral Classification**

GTAP sectoral classification (GSC3)			Korean I-O table sectoral classification	
01	pdr	Paddy rice	1	Unmilled rice
			25*	Agriculture, forestry and fishing services
02	wht	Wheat	2*	Wheat and other crops
			25*	Agriculture, forestry and fishing services
03	gro	Cereal grains nec	2*	Wheat and other crops
			25*	Agriculture, forestry and fishing services
04	v_f	Vegetables, fruit, nuts	5	Vegetables
			6	Fruits
			3	Pulses
			25*	Agriculture, forestry and fishing services
05	osd	Oil seeds	8	Other edible crops
			25*	Agriculture, forestry and fishing services
06	c_b	Sugar cane, sugar beet		Not existent
07	pfb	Plant-based fibers	13	Other inedible crops
			25*	Agriculture, forestry and fishing services
08	ocr	Crops nec	4	Potatoes
			7	Cultivated medicinal herbs
			8	Other edible crops
			9	Leaf tobacco
			10	Ornamental floriculture
			11	Natural rubber
			12	Seeds and seedlings
			25*	Agriculture, forestry and fishing services
09	ctl	Bovine cattle, sheep and goats, horses	15	Beef cattle
			18*	Other livestock breeding
			25*	Agriculture, forestry and fishing services
10	oap	Animal products nec	16	Swine
			17	Poultry and eggs
			18*	Other livestock breeding
			25*	Agriculture, forestry and fishing services
11	rmk	Raw milk	14	Dairy farming
			25*	Agriculture, forestry and fishing services
12	wol	Wool, silk-worm cocoons	18*	Other livestock breeding
			25*	Agriculture, forestry and fishing services
13	for	Forestry	19	Forest planting and conservation
			20	Raw timber
			21	Edible forestry products
			22	Misc. forestry products
			25*	Agriculture, forestry and fishing services
14	fish	Fishing	23	Fishing
			24	Aquaculture
			25*	Agriculture, forestry and fishing services
15	col	Coal	26	Anthracite
			27	Bituminous coal
16	oil	Oil	28	Crude petroleum
17	gas	Gas	29	Natural gas
18	omn	Minerals nec	30	Iron ores
			31	Other nonferrous metal ores
			32	Sand and stones
			33	Limestone
			34	Misc. nonmetallic minerals

19	cmt	Bovine cattle, sheep and goat, horse meat products	35*	Slaughtering and meat processing
20	omt	Meat products nec	35*	Slaughtering and meat processing
			36	Poultry slaughtering and processing
			37	Prepared meat products
			50*	Animal and vegetable fats and oils
21	vol	Vegetable oils and fats	50*	Animal and vegetable fats and oils
22	mil	Dairy products	38	Milk
			39	Dairy products
23	pcr	Processed rice	42*	Polished rice, barley and others
24	sgr	Sugar	44	Raw sugar
			45	Refined sugar
25	ofd	Food products nec	40	Processed fish and sea foods
			41	Frozen, salted, dried and smoked fish and sea foods
			42*	Polished rice and barley and others
			43	Flour and cereal preparations
			46	Starches, glucose, glucose syrup and maltose
			47	Bakery and confectionery products
			48	Noodles
			49	Seasonings
			51	Canned or cured fruits and vegetables
			52	Coffee and tea
			53	Ginseng products
			54	Miscellaneous foodstuffs
			55	Prepared livestock feeds
26	b_t	Beverages and tobacco products	56	Ethyl alcohol for beverages
			57	Distilled spirits (soju)
			58	Beer
			59	Other liquors
			60	Nonalcoholic drinks and ice
			61	Tobacco products
27	tex	Textiles	62	Natural yarn
			63	Chemical fiber yarn
			64	Other fiber yarns
			65	Natural fabrics
			66	Chemical fiber fabrics
			67	Other fiber fabrics
			68	Knitted fabrics
			69	Fiber bleaching and dyeing
28	wap	Wearing apparel	70	Textile products
			71	Cordage, rope, and fishing nets
			72	Misc. textile products
			73	Textile wearing apparels
			74	Knitted wearing apparels
			75	Leather wearing apparels
			76	Fur wearing apparels and products
			77	Clothing accessories
29	lea	Leather products	78	Leather
			79	Fur
			80	Luggage and handbags
			81	Footwear
			82	Other leather products
30	lum	Wood products	83	Lumber
			84	Plywood
			85	Reconstituted and densified wood

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			86	Wooden products for construction
			87	Wooden containers
			88	Other wooden products
31	ppp	Paper products, publishing	89	Pulp
			90	Printing paper
			91	Other raw paper and paperboard
			92	Corrugated paper and solid fiber boxes
			93	Paper containers
			94	Stationery paper and office paper
			95	Sanitary paper products
			96	Other paper products
			97	Printing
			98	Publishing and reproduction of recorded media
			331	Newspapers
			332	Publishing
32	p_c	Petroleum, coal products	99	Coke and other coal products
			100	Coal briquettes
			101	Naphtha
			102	Gasoline
			103	Jet oil
			104	Kerosene
			105	Light oil
			106	Heavy oil
			107	Liquefied petroleum gas
			108	Refined mixed oil
			109	Lubricants and grease
			110	Misc. petroleum refinery products
33	crp	Chemical, rubber, plastic products	111	Aliphatic petrochemical basic products
			112	Aromatic petrochemical basic products
			113	Petrochemical intermediate products
			114	Coal chemicals
			115	Other basic organic chemicals
			116	Industrial gases
			117	Basic inorganic chemicals
			118	Dyes, pigments, and tanning materials
			119	Synthetic resins
			120	Synthetic rubber
			121	Chemical fibers
			122	Medicaments
			123	Fertilizers and nitrogen compounds
			124	Pesticides
			125	Paints, varnishes, and allied products
			126	Printing ink
			127	Soap, detergents and dentifrices
			128	Cosmetics
			129	Adhesives, gelatin and sealants
			130	Photographic chemical products
			131	Misc. chemical products
			132	Primary plastic products
			133	Plastic products for construction
			134	Plastic products for package
			135	Plastic products for assembly
			136	Misc. plastic products
			137	Tires and tubes
			138	Industrial rubber products
			139	Misc. rubber products

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34	nmm	Mineral products nec	140	Sheet glass and primary glass products
			141	Glass products for electronics
			142	Industrial glass products except 141
			143	Other glass products
			144	Pottery, china and earthenware for home use
			145	Industrial pottery products
			146	Clay refractories
			147	Clay products for construction
			148	Cement
			149	Ready mixed concrete
			150	Concrete blocks, bricks, and other concrete products
			151	Lime, gypsum, and plaster products
			152	Cut stone & stone products
			155	Asbestos and mineral wool products
			153	Abrasives
			154	Asphalts
			35	i_s
157	Pig iron			
158	Ferroalloys			
159	Steel ingots and semifinished products			
160	Steel rods and bars			
161	Section steel			
162	Rails and wires			
163	Hot rolled steel plates and sheets			
164	Fabricated wire products			
165	Steel pipe and tubes, except foundry iron pipe and tubes			
166	Cold rolled steel sheet, strip, and bars			
167	Coated steel plates			
36	nfm	Metals nec		
			169	Copper smelting, refining and alloy
			170	Aluminium smelting, refining and alloy
			171	Lead and zinc smelting, refining and alloy
			172	Gold and silver ingots
			173	Other nonferrous metal ingots
			174	Primary copper products
			175	Primary aluminium products
			176	Other nonferrous metal castings and forgings, and primary nonferrous metals
			177	Metal foundries
37	fmp	Metal products	178	Metal products for construction
			179	Structural metal products
			180	Metal tanks and reservoirs
			181	Industrial boiler and steam generator
			182	Metal forgings and metallurgical products
			183	Metal pressed products
			184	Treatment and coating of metals
			185	Products made of coated metals
			186	Household metallic utensils
			187	Fastening metal products
			188	Hand tools
			189	Bolts, nuts, screws, rivets, and washers
38	mvh	Motor vehicles and parts	190	Metal cans, barrels, and drums
			191	Other metal products
			249	Passenger automobiles

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			250	Buses and vans
			251	Trucks
			252	Motor vehicles with special equipment
			254	Motor vehicle engines
			253	Trailers and containers
39	otn	Transport equipment nec	255	Motor vehicle chassis, bodies and parts
			256	Steel ships
			257	Other ships
			258	Ship repairing and ship parts
			259	Railroad vehicles and parts
			260	Aircraft and parts
			261	Motorecycles and parts
40	ele	Electronic equipment	262	Bicycles and parts and misc. transportation
			199	Office machines and devices
			214	Motors and generators
			215	Electric transformers
			216	Capacitors and rectifiers
			217	electric circuit switch and connection equipment
			218	Panel boards and automatic control panels
			219	Batteries
			220	Insulated wires and cables
			221	Electric bulbs and lamps
			222	Electric lighting fixtures
			223	Misc. electric equipment and supplies
			224	Semiconductor devices
			225	Integrated circuits
			226	LCD flat display
			227	Misc. electronic display equipment
			228	Printed circuit boards
			229	Electric resistors, storage batteries, electric coils, and transformers
			230	Misc. electronic components
			231	Computers
			232	Computer memory storage
			233	Computer and peripheral equipment
			234	Wire telephone and telegraph equipment
			235	Mobile communications equipment
			236	Misc. communication and broadcasting equipment
			237	Television receiving sets
			238	Film production equipment
			239	Audio and sound equipment
			240	Household refrigerators and freezers
			241	Cooking appliances and heating apparatus
			242	Other household electronic appliances
41	ome	Machinery and equipment nec	192	Engines and turbines
			193	Pumps and compressors
			194	Valves
			195	Bearings, gears, gearing and driving elements
			196	Conveyors and conveying equipment
			197	Air-conditioning equipment and industrial refrigeration equipment
			198	Filtering or purifying machinery for liquid and Gases
			200	Misc. machinery and equipment of general purpose

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			201	Agricultural implements and machines
			202	Construction and mining machines
			203	Metal cutting equipment
			204	Metal forming machine tools
			205	Metal molds and industrial patterns
			206	Semiconductor machines
			207	Display machines
			208	Food processing machines
			209	Textile and apparel machines
			210	Industrial robots
			211	Printing machines
			212	Rubber and plastic surgery equipment
			213	Misc. special purpose equipment
			243	Medical instruments and supplies
			245	Industrial automatic regulators
			244	Measuring and analytical instruments
			246	Cinematograph cameras and projectors
			247	Other photographic and optical instruments
42	omf	Manufactures nec	248	Watches and clocks
			263	Wood furniture
			264	Metal furniture
			265	Other furniture
			266	Toys and games
			267	Sporting and athletic goods
			268	Musical instruments
			269	Pens, pencils, and other artists' materials
			270	Jewelry and plated ware
			271	Models and decorations
			272	Misc. manufactured products
			273	Manufacturing and processing services
43	ely	Electricity	274	Water power generation
			275	Thermal power generation
			276	Atomic power generation
			277	In-house power generation
			278	Renewable energy generation
44	gdt	Gas manufacture, distribution	279	Manufactured gas supply
45	wtr	Water	280	Steam and hot water supply
			281	Water supply
46	cns	Construction	287	Residential building construction
			288	Nonresidential building construction
			289	Building repairs
			290	Road construction
			291	Railroad construction
			292	Breakwater, pier, and harbor construction
			293	Dam, levee, and flood control project construction
			294	Water main line and drainage project construction
			295	Land clearing and reclamation, and irrigation project construction
			296	Land leveling and athletic field construction
			297	Environment purification facilities
			298	Communications line construction
			299	Electric power plant construction
			300	Industrial plant construction
			301	Miscellaneous construction

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47	trd	Trade	302	Wholesale trade
			303	Retail trade
			318	General eating places
			319	Drinking places
			320	Misc. eating and drinking places
			321	Hotels and other lodging places
			378	Motor repair services
48	otp	Transport nec	304	Railroad passenger transportation
			305	Railroad freight transportation
			306	Road passenger transportation
			307	Road freight transportation
			308	Parcel delivery service
			312	Services incidental to road transportation
			315	Cargo loading or unloading operations
			316	Warehousing and storage
			317	Other services incidental to transportation
49	wtp	Water transport	309	Coastal and inland water transportation
			310	Deep sea transportation
			313	Services incidental to water transportation
50	atp	Air transport	311	Air transportation
			314	Airports, flying, fields and airport terminal services
51	cmn	Communication	322	Postal services
			323	Wire communication services
			324	Wireless communication services
			325	Misc. communication services
			326	Terrestrial broadcasting
			327	Cable and satellite broadcasting
			328	Information service
			329	Computer software development and supply
			330	Computer programming, data processing, and other computer related services
			333	Movie and audio production and distribution
52	ofi	Financial services nec	335	Central bank and banking institutions
			336	Financial investment institutions
			337	Other financial intermediaries
			340*	Services auxiliary to finance and insurance
53	isr	Insurance	338	Life insurance
			339	Casualty insurance
			340*	Services auxiliary to finance and insurance
54	obs	Business services nec	341*	Residential services
			342	Non-residential building rental
			343	Real estate development and supply
			344	Real estate agents and managers
			345	Renting of machinery and goods
			350	Legal and accounting services
			351	Market survey and management consulting services
			352	Advertising services
			353	Architectural and civil engineering services
			354	Engineering-related services
			355	Science and technology services
			356	Misc. special services
			357	Cleaning and disinfection services
			358	Manpower supply services
			359	Misc. business services

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55	ros	Recreational and other services	379	Machines repair services			
			334	Showing of movies			
			371	Culture services (public)			
			372	Theatrical producers, bands, and entertainers			
			373	Other culture services			
			374	Sports services			
			375	Amusement and recreation services			
			376	Business associations and professional membership organizations			
			377	Religious, political, labor, and other social organizations			
			380	Individual and home repair services			
			381	Barber and beauty shops			
			382	Laundry and cleaning services			
			383	Domestic services			
			384	Other personal services			
			56	osg	Public administration and defense, education, and health	360	Public government
						361	Local government
						362	Education services (public)
363	Education services (non-profit)						
364	Education services (commercial)						
365	Medical and health services(public)						
366	Medical and health services (non-profit)						
367	Medical and health services (commercial)						
368	Social insurance (public)						
369	Social welfare services (public)						
370	Social welfare services (non-profit)						
282	Treatment of sewage, waste water, and night soil(public)						
283	Treatment of sewage, waste water, and night soil (commercial)						
284	Collection and disposal of wastes (public)						
285	Collection and disposal of wastes (commercial)						
286	Resource recycling services						
346	Research and development(public)						
347	Research and development (non-profit)						
348	Research and development (commercial)						
349	Research and development in enterprise						
57	dwe	Dwellings	341*	Residential services (imputed rent)			

The \* signifies the sectors of the Korean I-O table affected by the splits.