Transforming the Bolivian 2004 Supply-Use Tables into a GTAP-compatible Input-Output format

By

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1. Introduction

The first Bolivian Input-Output (I-O) matrix into the GTAP global database was constructed by Carlos Ludena (GTAP Center, Purdue University, USA) and Sara Wong (*Escuela Superior Politécnica del Litoral*, Ecuador) in October 2005. These authors transformed the original Bolivian 2000 Supply-Use tables into a GTAP compatible I-O format[3].

This document explains the steps behind the transformation of the second Bolivian I-O matrix (2004 data) assembled for the GTAP global database, version 6.2. This transformation was done through a collaborative work between the University of Purdue and the University of Reading, following guidelines as per stated in the GTAP Technical Paper No 1.

The next section explains the data and structure of the Bolivian Make and Use matrices. Section 3 describes the process of transforming the database, outlining the steps followed to calculate GTAP's four arrays' that contain the transformed I-O data. Finally, sections 4 and 5 explain the sectoral aggregation and disaggregation and some final comments.

2. Preparing the Bolivian Data Base

2.1 Source Data

The Bolivian National Institute of Statistics (BNIS) is the official domestic institution in charge of collecting, classifying, coding, compiling, and releasing domestic statistical information. The BNIS is in charge of assembling national accounts data and supply-use matrices.

The second I-O matrix was built with data for the year 2004 obtained from the BNIS[4]. The source data includes Supply and Use tables which have a commodity by industry format. The units of this matrix are in thousands of local currency (*bolivianos*) in nominal terms at purchasers' prices, and include 35 commodity groups and 35 industries. The commodity groups are composed of 214 sub-groups of commodities and 1068 basic commodities[5].

2.2 Make Matrix

The Make or Supply table is a "Commodity by Industry" matrix showing the value of each commodity produced by each industry. The column entries represent the value of the different types of commodities produced by an industry. Column entries, therefore, show the product mix of an industry. They represent both the primary and secondary products produced by an industry. In a square matrix, the value of the primary product of an industry is shown in the diagonal cell.

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[3] Report of the first Bolivian I-O matrix in GTAP format can be accessed at: Carlos Ludena and Sara Wong, 2005. V6.1 Documentation - I-O Tables: Bolivia (2005). Center for Global Trade Analysis. https://www.gtap.agecon.purdue.edu/resources/download/2351.pdf

[4] Mr Hugo Alba Braun (halba@ine.gov.bo), Instituto Nacional de Estadística BOLIVIA.

[5] Source: Instituto Nacional de Estadística, 1992. Las cuentas nacionales de Bolivia, Marco teórico, Aspectos metodológicos, pp 81.

Each row shows a specific commodity produced by different industries. Each column shows the value of different commodities being produced by a given industry, where one is primary product and the rest are secondary products. In a Make matrix, the column's total output by industry, while the row's total is total output by commodity. These values are not necessarily equal because of secondary production.

2.3 Use Matrix

The Use matrix gives information on the uses of goods and services, and on cost structures of the industries. It is made up of four arrays:

I. Supply of goods and services: records all operations related to production of goods and services. Includes private and government production of goods and services, imports, taxes, transport and commercialization margins. Production is assessed at producer prices, including all indirect taxes and Value Added Tax (VAT or IVA in Spanish).

II. Intermediate Use of goods and services: captures monetary values of goods and services (inputs) that are used in the production process of other goods and services. For a diagonal matrix, the diagonal of this array corresponds to intra-consumption, i.e. industries' intermediate consumption of commodities produced within the same industry.

III. Final demand of good and services: includes final consumption of households, government, gross capital formation, exports and change in stocks (which is a variable that absorbs all those goods and services that were not consumed, guaranteeing thus equilibrium between supply and demand).

IV. Primary economic income generation activities: includes value added calculated as the difference between gross-production by economic activity (basic prices[6]) and intermediate consumption by economic activity (consumer prices[7]). From value added components, wages and salaries, taxes net of subsidies on production, depreciation and operating surplus by industry.

Graphically, the Use matrix presents the following four arrays:

Array I: Supply of Goods and Services	Array II: Intermediate Use of Goods and Services	Array III: Final Demand of Good and Services
	Array IV: Primary Economic Income Generation Activities	

Figure 1. Supply-Use table Array

[6] Basic price is a price received by producers minus any kind of taxes, plus any kind of subsidies. This price does not include transportation and marketing costs.
[7] Consumer price is a price paid by consumers that includes transportation and marketing costs.

In the Use matrix, the column total is total industry output (regardless of which commodity contributed to that output) and the row total is the total commodity output (regardless of what industry used that commodity).

The column totals of the Make matrix are equal to the column totals of the full Use matrix, equivalent to commodity outputs. On the other hand, the row totals of the Make matrix are equal to column totals of the full Use matrix, equivalent to the industry outputs.

3. Transforming the Bolivian I-O matrix to GTAP specifications

As per the GTAP Technical Paper No. 1, any I-O matrix to be introduced as contribution to the GTAP global database has to comply with standard data settings related to the organization of the structure of I-O tables, sectoral classification, treatment of imports and other key points. All contributed tables should appear in the same order as GTAP's 57 sectors database, and all data should be contained in four arrays (GTAP Technical Paper No. 1):

1) Usage of input *i* by use *u*, commodity tax inclusive (UP), is a matrix of post-commodity-tax values or a tax inclusive matrix of domestic use. Its dimensions are (2g+3),(g+5), where the dimension refers to the number of sectors present in the I-O matrix. In the Bolivian matrix, this dimension is (2x35+3 =) 73 rows by (35+5 =) 40 columns. The rows of this matrix refers to inputs into production (including domestic commodities, imported commodities, land, labour and capital), while the columns refer to uses of commodities including the 35 sectors (intermediate usage), plus 5 more sectors (private household consumption, government consumption, investment, changes in stocks and exports).

2) Usage of input *i* in use *u*, commodity tax excluded (UF), is a (2g+3),(g+5) matrix of pre-commodity-tax usage values. Given that the Bolivian matrix is a 35x35 sector matrix, the dimension of UF is (2x35+3 =) 73 rows by (35+5 =) 40 columns. This matrix has the same dimensions as the UP matrix, with the only difference that it does not include taxes. In summary, UP is to the post-commodity-tax values, while UF refers to the pre-commodity-tax values.

3) Output of sector *i*, non-commodity indirect tax included (OP)**,** is a vector of outputs, with dimension g (where g corresponds to the 35 sectors of the Bolivian I-O matrix). Each row of this vector refers to a domestic sector of total output that includes indirect taxes. Each of the 35 domestic sectors of OP vector is equal to the sum across inputs of the post-commodity-tax usage values (UP) plus non-commodity indirect taxes.

4) Imports of commodity i, import duties excluded (MF)**,** is a vector of imports without including import tariffs. The dimension is g, which corresponds to the 35 sectors of the Bolivian I-O matrix. Each sector is a row that corresponds to an imported commodity.

The next sections explain the calculations made to transform the original 2004 Bolivian Supply-Use tables into a GTAP compatible format.

3.1 Calculating UP

3.1.1 Make Matrix and Value Added

Because the GTAP model and its database are commodity by commodity, the multi-product (commodity by industry) Supply or Make table of Bolivia had to be converted to a single-product (commodity by commodity) database. Since the Make table was already a square matrix (35x35) we diagonalize it, by moving values of a commodity *j* across industries *i* to industry *j*, to produce a diagonal matrix, similar to the procedure in Ludena and Wong (2005).

As in the 2000 data, value added in the source data is not disaggregated into factor remunerations and tax components. To distribute value added into its components we use the 1996 Social Accounting Matrix (SAM) of Bolivia which has value added disaggregated, using the same steps as in Ludena and Wong (2005)[8]. Value added in the 1996 SAM accounted for labor and capital (wages and salaries, income from owner-operator, and capital income), and net indirect taxes. These shares we multiplied by the valued added share in the 2004 Use Matrix to distribute value added into its components.

After this initial estimation of value added we added the vector called Direct Purchases or *Compras Directas* in Intermediate Consumption to value added. After this initial transformation and estimation we assigned value added amongst different factors of production in the source data (land, labor and capital) according to the shares in Table 1 to do both, account for land and, distribute income from owner-operator to labor, land and capital. We use these shares differently, depending on whether the industry used or not natural resources.

For manufacturing and service –sectors for which we assumed no use of natural resources– the process of obtaining factors of production categories consisted of adding to labor (wages and salaries) and capital the assumed fraction of owner-operators' income imputed to labor and capital, respectively. By definition, value added for land was set to zero in these sectors. For those sectors that used natural resources such as primary agriculture, forestry, fish, oil, and mining, we followed the same procedure as in the sectors discussed before, except that the fraction assigned to land was positive. To distribute ownership of Dwellings, we applied the following shares across factors: a) 10% to labor, b) 10% to Land, and c) 80% to Capital.

Table 1. Shares of Factor Endowment in Value Added

Description	Factor Share[1]
Non-agricultural owner-operator income given to labor	0.6
Non-agricultural owner-operator income given to capital	0.4
Agricultural owner-operator income given to labor	0.6
Agricultural owner-operator income given to land	0.2
Agricultural owner-operator income given to capital	0.2
Gross fixed capital formation given to land	0.3
Gross fixed capital formation given to capital	0.7

[1]. Source: Mark Horridge, Center of Policy Studies, Monash University.

[8] See Appendix 1 for mapping between 2004 Supply-Use Sectors and 1996 SAM Sectors.

Finally, to maintain the commodity by commodity structure of the make matrix we multiplied value added by the cost shares of the make matrix.

3.1.2 Use Matrix (UP)

As in Ludena and Wong (2005), we make three corrections to the source Use matrix to meet GTAP specifications:

1. The Use matrix included a fictitious financial industry called Banking Imputation (*Imputación Bancaria*). In the Use table, this industry consumed only a Financial Intermediation commodity. We removed the fictitious sector from intermediate consumption of the Use table and assigned this value to households' final demands. In other words, the cell in the Use matrix that corresponded to the Financial Intermediation commodity and the Banking Imputation was set to zero, and the amount of that cell was placed into final demand of Households for Financial Intermediation.

2. We transformed the Use matrix from a commodity-by-industry to a commodity-by-commodity matrix. To perform this change, we applied commodity shares of total output within the same industry *j* in the Make table to distribute values by commodity from industry *i* to industry *j* in the Use matrix. We aggregated each of the various industries which consumed a given commodity *x* to yield the intermediate use of that commodity *x*, each of the various industries which consumed another given commodity *y* to yield the intermediate use of that commodity *y*, and so on. These new sectors have a cost structure that is a share-weighted sum of the cost structure of the parent industries that produce these commodities (in the Make matrix).

3. We included the values of the column vector called "Marketing and Transport Margins (*Márgenes de Comercialización y Transporte*) of the Make matrix into the commodity "Comercio" of the modified commodity-by-commodity Use matrix. This vector has a negative value in 'Comercio' equal to sum of all the other commodities. This negative value was set to zero as we included these values into the Use matrix. This adjustment captured margins across commodities and allowed to maintain the balance between sales and costs.

To separate the Use matrix into Domestic and Imports use, we used a vector of imports to distribute and extract import use by commodity. This vector of imports included imports, tariffs and taxes on imports (estimated by multiplying taxes on "Other Products and Imports" by the share of imports in the Use matrix). The resulting vector of imports was multiplied by row shares of each commodity *i* in industry *j*, to estimate and extract imports use.

The GTAP specification does not allow re-exports, so we distributed all exports to the Domestic Use matrix, allocating zeros into these columns in the Import Use matrix. This procedure produced both domestic and import tables commodity tax inclusive (matrix "UP" in GTAP notation).

3.2 Calculating UF

Both domestic and import Use matrices included taxes. To produce tax-free matrices ("UF" in GTAP notation), we obtained the amount of taxes corresponding to both imports and domestic intermediate and final demands (except from "Change in Stocks") and subtracted these taxes from the corresponding demands.

There were two types of taxes: sales (domestic and imports) and production taxes. These taxes were included in the Value Added tax (*Impuestos al valor agregado*) and Transaction and other Production and Import taxes (TOCIT) (*Impuesto a las transacciones y otros impuestos a los productos y las importaciones*).

The source data had values of the distribution of these taxes between intermediate (as an aggregate) and final demand (household and government demand, net capital formation, change in stocks, and exports). Using this distribution, we obtained two matrices of the shares of taxes in intermediate and final demand that were applied to distribute the tax vectors into intermediate and final demand. We distributed taxes within intermediate demand (all 35 industries) by using the Use matrix's shares. Once we obtained the portion of other import taxes from the TOCIT taxes we subtracted this portion from TOCIT to get production taxes.

Using the share of imports in the use matrix, we split sales taxes into domestic and import taxes. To obtain a matrix of import taxes we added the import portion of value added tax and the import portion of TOCIT. Domestic sales taxes include domestic value added taxes only. The resulting domestic and import tax matrices were finally subtracted from both domestic and import use (tax inclusive) to obtain both domestic and import use free of taxes.

3.3 Calculating OP

To obtain a vector of output of sector *i* non-commodity net indirect tax included (vector "OP" in GTAP notation), we added together the sum of domestic and imports intermediate use, value added, and production taxes (other domestic taxes). The Bolivia source data had production taxes mixed with other taxes on imports. We separated out production taxes from other import taxes as explained in section 3.4 above, and added these production taxes to intermediate use (domestic and imports) and value added to obtain the OP vector.

3.4 Calculating MF

Finally, to produce a vector of imports by commodities with import duties excluded (vector "MF" in GTAP notation) we removed tariffs from the totals of free-of-consumption-tax Imports Use table.

4. Commodity Aggregation and Splits

According to the sectorial concordance between GSC2 sectors and the Bolivia IO table (Appendix 2B) we aggregated the 35 sectors from Bolivia into 32 sectors, assuring balance was maintained. For example, "beverages" and "Processed Tobacco" were aggregated to the GSC2 sector "Beverages and tobacco products".

The only split that we performed was of "Textiles" into the three corresponding GTAP sectors (Textiles [tex], Wearing Apparel [wap], Leather Products [lea]) using shares of Gross Value of Output. The shares were tex (10.91%), wap (54.96%) and lea (34.13%)[9]. We use these shares to split Textiles across commodities and industries in intermediate use, final demand (UP and UF), output (OP) and imports (MF). The rest of the sectoral split to map the Bolivian sectors in the aggregated IO to the 57 GSC2 sectors was performed at the GTAP Center, using the cost structure of their "GTAP Representative Table" (chapters 13 and 14, Dimaranan and McDougall, 2002).

5. Final Comments

The only data lost as a result of moving between the source data and the GTAP format were the data of direct purchases in both: final demand (Household Consumption and Exports) and imports (of services). The negative value added in the fictitious financial sector was also excluded. An additional change was that final private consumption in "Machinery and Equipment" was negative. We make the value of final consumption in Machinery and Equipment equal to zero, and subtract an equal amount from change in stocks, both in UP and UF. Appendix 3 provides a summary diagram of the procedures applied to the source data to bring it into the GTAP format.

References

Huff K., R. Mcdougall, T. Walmsley. 2000. Contributing Input-Output Tables to the GTAP Data Base. Center for Global Trade Analysis (GTAP), Technical Paper No. 1 https://www.gtap.agecon.purdue.edu/resources/download/1916.pdf

Instituto Nacional de Estadística. 1992. Las Cuentas Nacionales de Bolivia, Marco Teórico, Aspectos metodológicos

Ludena, C. and S. Wong. 2005. V6.1 Documentation - I-O Tables: Bolivia. Center of Global Trade Analysis, Purdue University. https://www.gtap.agecon.purdue.edu/resources/download/2351.pdf

United Nations Statistics Division - National Accounts http://unstats.un.org/unsd/sna1993/toclev8.asp?L1=1&L2=2

[9] Source: Hugo Alba Braun, National Accounts, National Statistics Institute, Bolivia

APPENDIX 1. Mapping 1996 SAM 41 Sectors to 2004 Supply-Use 35 Sectors

No.	Supply-Use Sectors	No.	Social Accounting Matrix (SAM) Sectors
1	Agricultural Products – Non-Industrial	1.1	Agricultural Products – Non-Industrial
2	Agricultural Products – Industrial	1.2	Agricultural Products – Industrial
3	Coca	1.3	Coca
4	Livestock Products	1.4	Livestock Products
5	Forestry, Hunting and Fishing	1.5	Forestry, Hunting and Fishing
6	Oil and Natural Gas	2.1	Oil and Natural Gas
7	Metallic and Non-Metallic Minerals	2.2	Metallic and Non-Metallic Minerals
8	Fresh and Processed Meat	3.1.01	Fresh and Processed Meat
9	Dairy Products	3.1.02	Dairy Products
10	Milling and Bakery Products	3.1.03	Milling and Bakery Products
11	Sugar and Candy Products	3.1.04	Sugar and Candy Products
12	Other Food Products	3.1.05	Other Food Products
13	Beverages	3.1.06	Beverages
14	Processed Tobacco Products	3.1.07	Processed Tobacco Products
15	Textiles, Apparel and Leather Products	3.2.01	Textiles, Apparel and Leather Products
16	Wood Products	3.2.02	Wood Products
17	Paper Products	3.2.03	Paper Products
18	Chemical Products	3.2.04	Chemical Products
19	Petroleum Products	3.2.05	Petroleum Products
20	Non-Metallic Mineral Products	3.2.06	Non-Metallic Mineral Products
21	Basic Metal Products	3.2.07	Basic Metal Products
22	Metal Products, Machinery, and Equipment	3.2.08	Metal Products, Machinery, and Equipment
23	Other Manufactured Products	3.2.09	Other Manufactured Products
24	Electricity, Gas and Water	4	Electricity, Gas and Water
25	Construction	5	Construction
26	Trade	6.01	Trade
27	Transport and Storage	6.02	Transport and Storage
28	Communication	6.03	Communication
29	Financial Services	6.04	Financial Services: Banking and Insurance
		6.05	Financial Services: Industry
30	Business Services	6.06	Business Services
31	Dwellings	6.07	Dwellings
32	Community, Social and Personal Services	6.08.01	Private Education
		6.08.02	Private Health
		6.08.03	Other Community, Social and Personal Services
33	Restaurants and Hotels	6.09	Restaurants and Hotels
34	Domestic Services	6.10	Domestic Services
35	Public Administration Services	7.01	General Administration
		7.02	Public Education
		7.03	Public Health
		7.04	Basic Sanitation

APPENDIX 2A. Commodity classification and Concordance between Bolivia IO Table and ISICr3

Commodity No.	Description	ISICr3
1	Agricultural Products – Non-Industrial	0111-0113
2	Agricultural Products – Industrial	0111-0113
3	Coca	0111
4	Livestock Products	0121-0123
5	Forestry, Hunting and Fishing	0150, 0200, 0500
6	Oil and Natural Gas	1110, 1120
7	Metallic and Non-Metallic Minerals	1200-1429
8	Fresh and Processed Meat	1511-1514
9	Dairy Products	1520
10	Milling and Bakery Products	1531, 1533, 1541, 1544
11	Sugar and Candy Products	1542-1543
12	Other Food Products	1514-1532, 1549
13	Beverages	1551-1554
14	Processed Tobacco Products	1600
15	Textiles, Apparel and Leather Products	1711-1712, 1721-1723, 1729-1730, 1810, 1820, 1911-1912, 1920
16	Wood Products	2021-2022, 2029
17	Paper Products	2101-2102, 2109, 2211-2212, 2219, 2221-2222, 2230
18	Chemical Products	2411, 2413, 2421-2424, 2429-2430 , 2511, 2519, 2520
19	Petroleum Products	2320
20	Non-Metallic Mineral Products	2610, 2691-2696
21	Basic Metal Products	2710, 2720, 2731-2732
22	Metal Products, Machinery, and Equipment	2811-2812, 2892-2893, 2899, 2913-2914, 2919, 2921-2922, 2924-2925, 2929-2930, 3110, 3120, 3130, 3140, 3150, 3190, 3311, 3320, 3420, 3430, 3512, 3520, 3592
23	Other Manufactured Products	3610, 3691-3692, 3694, 3699
24	Electricity, Gas and Water	4010, 4020, 4100
25	Construction	4510, 4520, 4530, 4540, 4550
26	Trade	5110-5260
27	Transport and Storage	6010-6023, 6030, 6110, 6120, 6210-6220, 6301-6309
28	Communication	6411-6412, 6420,
29	Financial Services	6511, 6519, 6601, 6603, 6720
30	Business Services	70, 71, 72, 73, 74, 7020-7499
31	Dwellings	7010
32	Community, Social and Personal Services	80, 90
33	Restaurants and Hotels	5510, 5520
34	Domestic Services	9500
35	Public Administration Services	7511-7514, 7521-7523, 7530

APPENDIX 2B. Concordance between GSC2 Sectors and Bolivia IO table

GSC2 No.	GSC2 Code	GSC2 Description	Bolivia Commodity Name	Bolivia Commodity No.
1	pdr	Paddy rice	Agricultural Products – Non-Industrial	1
2	wht	Wheat	Agricultural Products – Non-Industrial	1
3	gro	Cereal grains nec	Agricultural Products – Non-Industrial	1
4	v_f	Vegetables, fruit, nuts	Agricultural Products – Non-Industrial	1
5	osd	Oil seeds	Agricultural Products – Industrial	2
6	c_b	Sugar cane, sugar beet	Agricultural Products – Industrial	2
7	pfb	Plant-based fibers	Agricultural Products – Industrial	2
8	ocr	Crops nec	Coca	3
9	ctl	Cattle, sheep, goats, horses	Livestock Products	4
10	oap	Animal products nec	Livestock Products	4
11	rmk	Raw milk	Livestock Products	4
12	wol	Wool, silk-worm cocoons	Livestock Products	4
13	for	Forestry	Forestry, Hunting and Fishing	5
14	fsh	Fishing	Forestry, Hunting and Fishing	5
15	col	Coal	Oil and Natural Gas	6
16	oil	Oil	Oil and Natural Gas	6
17	gas	Gas	Oil and Natural Gas	6
18	omn	Minerals nec	Metallic and Non-Metallic Minerals	7
19	cmt	Meat: cattle, sheep, goats, horse	Fresh and Processed Meat	8
20	omt	Meat products nec	Fresh and Processed Meat	8
21	vol	Vegetable oils and fats	Other Food Products	12
22	mil	Dairy products	Dairy Products	9
23	pcr	Processed rice	Milling and Bakery Products	10
24	sgr	Sugar	Sugar and Candy Products	11
25	ofd	Food products nec	Other Food Products	12
26	b_t	Beverages and tobacco products	Beverages	13
			Processed Tobacco Products	14
27	tex	Textiles	Textiles, Apparel and Leather Products	15
28	wap	Wearing apparel	Textiles, Apparel and Leather Products	15
29	lea	Leather products	Textiles, Apparel and Leather Products	15
30	lum	Wood products	Wood Products	16
31	ppp	Paper products, publishing	Paper Products	17
32	p_c	Petroleum, coal products	Petroleum Products	19
33	crp	Chemical, rubber, plastic prods	Chemical Products	18
34	nmm	Mineral products nec	Non-Metallic Mineral Products	20
35	i_s	Ferrous metals	Basic Metal Products	21
36	nfm	Metals nec	Basic Metal Products	21
37	fmp	Metal products	Metal Products, Machinery, and Equipment	22
38	mvh	Motor vehicles and parts	Metal Products, Machinery, and Equipment	22
39	otn	Transport equipment nec	Metal Products, Machinery, and Equipment	22
40	ele	Electronic equipment	Metal Products, Machinery, and Equipment	22

APPENDIX 2B. Concordance between GSC2 Sectors and Bolivia IO table (Continued)

GSC2 No.	GSC2 Code	GSC2 Description	Bolivia Commodity Name	Bolivia Commodity No.
41	ome	Machinery and equipment nec	Metal Products, Machinery, and Equipment	22
42	omf	Manufactures nec	Other Manufactured Products	23
43	ely	Electricity	Electricity, Gas and Water	24
44	gdt	Gas manufacture, distribution	Electricity, Gas and Water	24
45	wtr	Water	Electricity, Gas and Water	24
46	cns	Construction	Construction	25
47	trd	Trade	Trade	26
			Hotels and Restaurants	33
48	otp	Transport nec	Transport and Storage	27
49	wtp	Sea transport	Transport and Storage	27
50	atp	Air transport	Transport and Storage	27
51	cmn	Communication	Communication	28
52	ofi	Financial services nec	Financial Services	29
53	isr	Insurance	Business Services	30
54	obs	Business services nec	Business Services	30
55	ros	Recreation and other services	Community, Social and Personal Services	32
			Domestic Services	34
56	osg	PubAdmin/Defence/Health/Educat	Public Administration Services	35
57	dwe	Dwellings	Dwellings	31

APPENDIX 3. Process of formatting Bolivian data to GTAP format