

Honduras

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1. Introduction

This document details the steps taken to create the first Honduras input-output matrix (IOM) for the Global Trade Analysis Project (GTAP). This IOM is based on the Social Accounts Matrix (SAM) developed by IFPRI (International Food Policy Research Institute) in June 2009, which is based on 2004 data.

2. Source of Data

The Social Accounts Matrix (SAM) for Honduras has been developed by the IFPRI (International Food Policy Research Institute), considering information from the Central Bank of Honduras. This source is particularly useful because of the number of similarities and flexibility to convert it into an IOM, according to the specifications required by GTAP.

This SAM, used as source, is distributed in the format industry (activity) by commodity (product), considering 81 commodities and 81 activities, valued at producer prices. Furthermore, it presents the factors of production, households, public sector and industry, investment and the rest of the world.

3. Adaptation of the IOM for GTAP

The various stages undertaken to adapt the I-O table for GTAP are illustrated in Annex 1.

To begin the conversion from the original SAM, the accounts were rearranged, obtaining a compact IOM (see Annex 2). This matrix is characterized by the following information:

- Use Matrix, commodity-by-industry format, which also includes investment, private consumption and government spending, the change in stocks and exports
- Vector of imports, excluding rates
- Vector of taxes, which contains tariffs, VAT, other taxes, subsidies, trade margins and transport margins
- Value added, which considers the capital, labor, taxes and land factor (for which no information was available, subsequently, it was set to 0)
- Make matrix, already diagonalized in the 2004 SAM

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The matrices above were relocated into a new array to check the consistency of the data, specifically that the column totals were equal to the totals of the rows. This means that the production was equal to the costs.

This information was previously handled in Microsoft Excel and then introduced into GEMPACK, using as an example, the case of Guatemala previously sent to GTAP (Ludena, Duran and Schushny, 2008) whose source code and data were modified to meet the requirements of Honduras' economic structure. Note that the original SAM had 81 industries, each producing a commodity, which simplified the concordance between industries and commodities. Segments of the original matrix can be found in Annex 3 with their respective correlations to GTAP sectors. This allowed the identification of sectors that needed to be split later (see 4) for a square matrix of the 83 industries.

3.1 Make Matrix

This matrix, which is characterized by a commodity by industry format, has been obtained directly from the Honduras SAM. Note that this matrix was already in diagonal form, which simplified the calculations and subsequent checks.

3.2 Value Added to Factors of ORANI-G (Labor, Capital and Land)

The data source categories had capital and other taxes, which were replicated under the categories of ORANI-G. The work merged the 8 categories of laborers presented, which were specifically:

Labor formal sector, urban skilled
Labor formal sector, urban unskilled
Labor formal sector, rural, skilled
Labor formal sector, rural, unskilled
Labor, self employed, urban, skilled
Labor, self employed, urban, unskilled
Labor, self employed, rural, skilled
Labor, self employed, rural, unskilled

No information was available of the land item, so it remained at zero to keep the consistency of the data. The correlations between the data applied to the SAM 2004 and GTAP requirements are in Annex 4.

3.3 Trade and Transport Margins

The trade and transport margins were included as vectors which were then redistributed by GEMPACK so that trade margins were included in the trade sector and transport margins were added in the category transport services.

3.4 Separation of Locally Produced and Imported Goods

The 2004 Honduras SAM used as a source, presented the imports as a separate vector. For this reason it was necessary to create an import share matrix which was used to obtain domestic and import use. This methodology has been applied in several contributions to GTAP, including the case of Guatemala (used as main reference).

3.5 Taxes: Building Tax Matrix

The original SAM matrix had the following types of taxes: taxes on imports, VAT value added tax, indirect taxes and subsidies.

It was necessary to redistribute the various categories of taxes to distinguish between tariffs, VAT, other taxes and subsidies; the categories used in input-output matrices previously provided to GTAP. The import tax rates were considered as tariffs, the VAT was taken without changes, indirect taxes were added to the category other taxes and subsidies were left unchanged.

From this information it was possible to create an array of taxes on domestic goods, and an array of tariffs (or taxes on imports). These matrices were used to obtain duty-free domestic production and imports without tariffs.

3.6 Matrix of Use, Including Tax (UP) and No Tax (UF)

The matrix included taxes that were obtained directly from the SAM, for which trade and transport margins were transposed to be added later in trade and transport sectors. After this adjustment, the balance between sales and cost still holds.

The taxes and tariffs matrices were subtracted from Imports and Domestic Use, generating Imports free of tariffs (MUF) and Domestic use, tax free (DUF).

3.7 Re-exports

GTAP does not support re-exports, so the export vector of imported goods was equal to zero. This held the consistency of the data with respect to the balance between sales and costs.

3.8 Output (OP) and Imports, Net of Tax (MF)

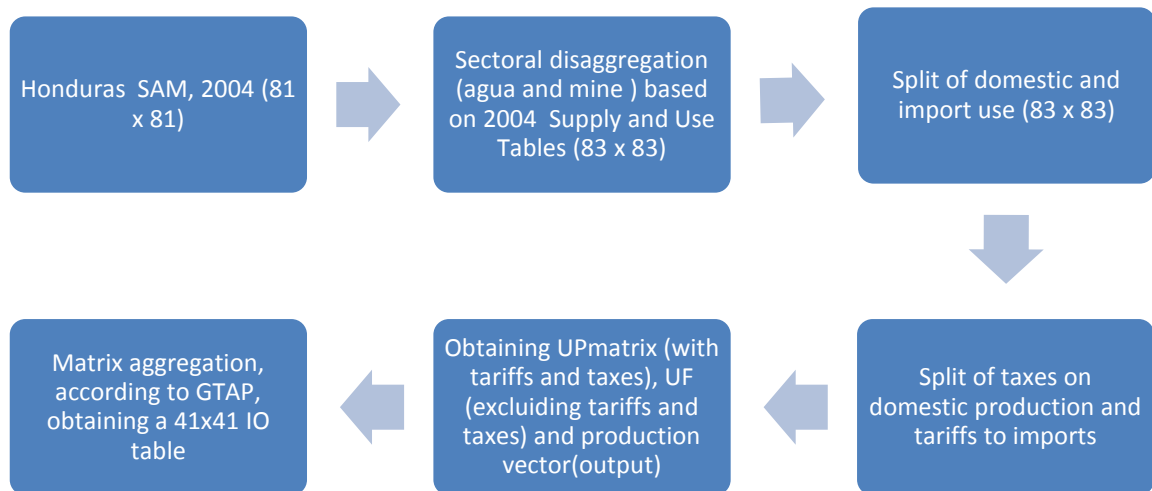
The vector of production (output) of sector i , including indirect taxes, involved the sum of domestic and imported intermediate production, value added and indirect taxes on production. Moreover, the matrix that excludes taxes (MF) has been generated by subtracting the tax vector to the import matrix that originally included taxes.

4. Adaptation of the IOM for GTAP

The 81 sectors that had the original Matrix Honduras SAM provided a sufficient level of disaggregation. Nevertheless, to meet the mandatory splits, the original sectors "water" and "mine" required a special treatment. The information used to split them from the point of view of production is in Annex 5. By the supply side, the Central Bank of Honduras provided supply and use tables that were used to separate costs, preserving the industrial structure. The consistency of the total was achieved through the distribution of differences between value added, inventories and imports. The details of the methodology are shown in Annex 6.

The process described implied the extension of the SAM from 81 to 83 sectors, which were then aggregated in 41 sectors - GSC2 (see Annex 7). A correlation between these and the 57 GTAP sectors were also established (Annex 8).

Annex 1: Steps in the construction of the SAM



Annex 2: MIP compact, Input for Gempack

[illegible]

Annex 3: Matches between the 2004 SAM and GTAP sectors

SAM Sector	Description	GSC 2
maiz	Maize	gro
frij	Beans	pfbwhtocr
cere	Cereals	gro
palm	Oil palm	osd
taba	Snuff unprocessed (raw) leaves and snuff	pfbwhtocr
cana	Sugarcane	c_b
hort	Vegetables, tubers and other plant products	pfbwhtocr
frut	Fruit and Plants Drinkables	pfbwhtocr
bana	Bananas	v_f
café	Coffee Grape	pfbwhtocr
gana	Cattle and other animals / include Milk	ctlrmk
avic	Poultry, Eggs and fertilizers	woloap
silv	Wood & Wood Products	for
pesc	Fish and Seafood	fsh
cama	Farmed shrimp and shrimp larvae	fsh
minm	Nonferrous metal ores and concentrates	omn
nmmnfm²	Mining products	nmmnfm
coloilp_c	Mining products	coloilp_c
carn	Meat and edible offal and other animal products / except Poultry	cmt
cavic	Meat and edible offal of poultry (fresh, chilled or frozen)	omt
pcar	Sausages and other meat products	omt
ppes	Frozen fish	ofd
pveg	Pulses fruits and nuts, cooked in water, frozen and canned juices and concentrates	ofd
acei	Oil, butter and other fats	vol
lact	Dairy products	mil
parr	Gold and husked rice	pdrpcr

² This sector and coloilp_c used to be included originally into “mine”. They were separated to met the mandatory splits

hari	Flour and other meals	ofd
pana	Bakery	ofd
azuc	Sugar and Molasses	sgr
canim	Preparation of feed concentrates	ofd
choc	Cocoa, chocolate and sugar confectionery	ofd
past	Macaroni, noodles and similar farinaceous products	ofd
pcaf	Gold Cafe	ofd
potros	Coffee and Other Food Products	ofd
beba	Ethyl alcohol, distilling, rectifying, fermentation and blending of spirits, wines	b_t
cerv	Beer made from malt	b_t
bebn	Bottled water and other nonalcoholic drinks	b_t
ptab	Snuff Products	b_t
hila	Yarn and thread, textile fabrics	tex
text	Textiles, Knitting and Crochet Garment Exc	tex
vest	Clothing and fur	wap
cuer	Leather & Leather Goods	lea
calz	Footwear and footwear parts	lea
made	Treated lumber and	lum
pmad	Wood products, cork, straw and plaiting materials, except furniture	lum
pape	Newsprint, other paper and paperboard, processed, and corrugated paper and paperboard packaging	ppp
impr	Products of the publishing and printing	ppp
farm	Pharmaceuticals and medicines	crp
quim	Basic Chemicals and Other Chemicals	crp
neum	Tires and inner tubes	crp
plas	Plastic	crp
vidr	Glass and glass products	nmmnfm
ceme	Cement and Other	nmmnfm
omet	Other fabricated metal products	fmp
meta	Base metals	i_s
pmet	Structural metal products and parts	fmp

maqu	Machinery, Transport Equipment and appliances	omeotnmvh
mueb	Furniture & Other Furniture Parts	omf
oman	Other manufactured goods (jewelry, musical instruments, sporting goods, games and toys)	omf
elygasgdt ³	Drinking water	elygasgdt
wtr	Drinking water	wtr
const	Construction	cns
scom	Trade services	trd
sman	Maintenance and repair	trd
shot	Services of hotels and accommodation analagos	trd
sres	Services catering and beverages	trd
strc	Road transport	o_a_wtp
svia	Travel Agencies and Other Additional Services	o_a_wtp
spos	Postal and Courier Services	cmn
scmn	Equipment, radios, television and communication equipment and parts and pieces	ele
sfin	Financial Services	ofiisr
sinm	Nonresidential real estate services and real estate agencies	obsdwe
sarr	Leasing Services	obsdwe
sinf	Computer and related services	obsdwe
sjur	Legal Services	obsdwe
scon	Accounting, auditing, bookkeeping, consulting, market research, architecture, engineering, research and development, etc..	obsdwe
sens	Education services	osg
ssal	Health Services	osg
sasc	Organization services	osg
scin	Services for film, radio and television and other entertainment	ros
sest	Entertainment Services	ros
ssoc	Social and personal services	osg
sgov	Public administration	osg

³ Along to wtr, it was included into the “agua” sector. It was splitted, because it also contained electricity and gas.

Annex 4: Correlation between sectors of the SAM 2004 and the factors ORANI-G

Gempack Input	Name in the SAM	SAM code	SAM Description
Labor	Trabajo	flabf-ursk	Labor formal sector, urban skilled
		flabf-urns	Labor formal sector, urban unskilled
		flabf-rusk	Labor formal sector, rural, skilled
		flabf-runs	Labor formal sector, rural, unskilled
		flabc-ursk	Labor cuenta propistas, urban, skilled
		flabc-urns	Labor cuenta propistas, urban, unskilled
		flabc-rusk	Labor cuenta propistas, rural, skilled
		flabc-runs	Labor cuenta propistas, rural, unskilled
Capital	Capital	fcap	Capital
DomTax	Impuestos a los bienes domesticos	dtax	Direct taxes
		iva	Value added tax
		itax	indirect tax
		sub	Subsidies
		atax	Activity tax
Mtar	Tarifas netas	mtax	Import tariffs
X	Exportaciones	row	Rest of world
Mcif	Importaciones	row	Rest of world
C	Hogares	hur-sk	Household, urban skilled
		hur-ns	Household, urban unskilled
		hru-sk	Household, rural, skilled
		hru-ns	Household, rural, unskilled
G	Gobierno		Government
I	Inversion	s-i	Savings-investment
S	Inventarios	dstk	change in stock
X	Exportaciones	row	Rest of world

Annex 5: Information on production and imports used for the splits

Sector SAM 2004	Producción	Importaciones	Oferta total (precios básicos)	GSC2 agg
ELECTRICIDAD Y AGUA (agua)	7,719	399	8,117	
Energía eléctrica, gas, vapor y agua caliente	6,838	399	7,237	elygasgdt
Agua potable	881	0	881	wtr
MINERALES NO METÁLICOS (mine)	1,035	157	1,192	
Piedra de construcción	302	0	302	nmmnfm
Arena,grava de construcción	632	2	634	nmmnfm
Otras arenas naturales, arcillas, tierras	61	6	68	nmmnfm
Sal común	38	19	57	nmmnfm
Otros minerales no metálicos n.c.p., inc. carbón mineral y petróleo crudo	0	131	131	coloilp_c

Annex 6: methodology for dealing with differences between production and costs

Original sector	mine		agua	
Disaggregation	nmmnfm	coloilp_c	elygasgdt	wtr
Methodology to deal with the difference between production and costs	The difference was distributed proportionally among added value factors	Imports and stocks were modification, because there is no domestic production	The difference was distributed proportionally among added value factors	The difference was distributed proportionally among added value factors

Annex 7: Aggregation of sectors

No.	Sector	No.	Sector
1	b_t	22	ofd
2	c_b	23	ofiisr
3	cmn	24	omeotnmvh
4	cmt	25	omf
5	cns	26	omn
6	coloilp_c	27	omt
7	crp	28	osd
8	ctrlmk	29	osg
9	ele	30	pdrpcr
10	elygasgdt	31	pfbwhtocr
11	fmp	32	ppp
12	for	33	ros
13	fsh	34	sgr
14	gro	35	tex
15	i_s	36	trd
16	lea	37	v_f
17	lum	38	vol
18	mil	39	wap
19	nmmnfm	40	woloap
20	o_a_wtp	41	wtr
21	obsdwe		

Annex 8: Concordance between the 57 GTAP sectors and 41 sectors aggregated from Honduras

GTAP Sector	Sector Honduras (41)	GTAP Sector	Sector Honduras (41)
pdr	pdrpcr	lea	lea
wht	pfbwhtocr	lum	lum
gro	gro	ppp	ppp
v_f	v_f	p_c	coloilp_c
osd	osd	crp	crp
c_b	c_b	nmm	nmmnfm
pfb	pfbwhtocr	i_s	i_s
ocr	pfbwhtocr	nfm	nmmnfm
ctl	ctrlmk	fmp	fmp
oap	woloap	mvh	omeotnmvh
rmk	ctrlmk	otn	omeotnmvh
wol	woloap	ele	ele
for	for	ome	omeotnmvh
fsh	fsh	omf	omf
col	coloilp_c	ely	elygasgdt
oil	coloilp_c	gdt	elygasgdt
gas	elygasgdt	wtr	wtr
omn	omn	cns	cns
cmt	cmt	trd	trd
omt	omt	otp	o_a_wtp
vol	vol	wtp	o_a_wtp
mil	mil	atp	o_a_wtp
pcr	pdrpcr	cmn	cmn
sgr	sgr	ofi	ofiisr
ofd	ofd	isr	ofiisr
b_t	b_t	obs	obsdwe
tex	tex	ros	ros
wap	wap	osg	osg
		dwe	obsdwe

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