

11.G

Vietnam

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11.G.1 *The Original Input-Output Data*

The data used in preparing the input-output table for the Vietnamese economy come from a 1997 Social Accounting Matrix (SAM) for Vietnam documented in Nielsen, Chantal Pohl (2001) *Social Accounting Matrices for Vietnam: 1996 and 1997*. Working Paper No. 8/2001, Danish Institute of Agricultural and Fisheries Economics (SJFI), Copenhagen.

The original data sources used to construct the SAM include national accounts statistics, government budget data, the official 1996 input-output table, the 1997/98 Vietnam Living Standards Survey (VLSS), and COMTRADE trade data. In its full disaggregation, the SAM includes 97 producing sectors. The agri-food sectors are well represented: there are eight primary agricultural sectors, two agricultural service sectors, and 13 food processing industries. There are five factors of production (three types of labor distinguished by skill level, one type of capital and one type of land), six household types (distinguished by rural/urban, agricultural/non-agricultural, wage/self-employed), and one account each for enterprises, government, investment/savings and rest-of-world. The rest-of-world account is a purely non-trade-related account that keeps track of financial transfers between Vietnamese institutions (households, enterprises, government, etc.) and the rest of the world. This is because imports and exports are distinguished by trading partner in this particular SAM, more specifically, 94 partner countries are identified. The unit of accounts are billions of Vietnamese Dong and the flows in the SAM include margins.

11.G.2 Mapping Procedure

In spite of the relatively high level of disaggregation in the agri-food sectors in the original SAM, the high level of detail cannot be fully utilized in preparing the data for use in GTAP. This is due to a slightly different focus between in the sectoral classifications of the SAM and the GTAP data bases. In order to establish concordance to the GTAP GSC2 sectors, the primary agricultural sectors in the SAM were aggregated to four sectors and the food processing industries were aggregated to six sectors. The disaggregation of these sectors in accordance with the GTAP GSC2 sectors is handled by GTAP staff using supplementary agriculture and food data. In addition, two manufacturing sectors in the Vietnamese table needed disaggregation. The Vietnamese data do not separate oil and gas nor do they separate iron and steel from other ferrous metals. Disaggregation of these sectors were also left to GTAP staff. The 95-sector Vietnam table was mapped to a 45-sector aggregation of GSC2. Appendix Table 11G.A1 shows the mapping from the 97 Vietnam SAM sectors to a 45-sector aggregation of the 57 GTAP GSC2 sectors.

A more substantial change needed in the mapping procedure concerns the irrigation and other agricultural services sectors which are separately identified in the original Vietnam data. These types of services are included in the primary agricultural sectors as defined by the GSC2 classification. The Vietnamese SAM was therefore adjusted to address this. The services were included in first three (crops) and four (crops plus livestock) sectors of the 45-sector GSC2 aggregation (see Appendix Table 11G.A1), respectively. The first step was to re-allocate the costs of these services to include them in the costs of primary agricultural inputs for each producing sector that uses agricultural and irrigation services. This was done using the cost shares of the primary agricultural inputs for each producing sector. This of course increased the value of intermediate demand for the primary agricultural products as originally defined. Hence the costs of these sectors' production was increased by this difference. This was done by using the average cost structure of the agricultural and irrigation services sectors. This adjustment procedure resulted in minor imbalances of the SAM which were then addressed with the use of the maximum entropy approach (Robinson and El-Said, 2000).

11.G.3 Other Data Adjustments

The SAM, as documented in Nielsen (2001), does not distinguish between investments and changes in stocks. However, the original Vietnamese input-output table for 1996 does separate these two components of gross capital formation. Therefore, the sectors with consumption of fixed assets were identified, and the shares thereof were separated from total gross capital formation in order to generate the two vectors – investments by industry and changes in stocks by industry.

The Vietnam SAM does not contain separate matrices and vectors for domestic and import sources for each of the use categories: intermediate usage, investment usage, household consumption, government consumption and changes in stocks. In order to create such matrices for use in the GTAP data base, an import share is calculated for each commodity based on the share of imports in domestic usage (i.e. total usage less exports). These shares are used to split the relevant matrices and vectors.

The GTAP sector ‘dwellings’ is not included in the original input-output data. This sector was created with the help of information provided in the Vietnam Living Standards Survey 1997/1998 (GSO 2000). According to the survey data, households in Vietnam spend 7.51 percent of their total consumption expenditure on housing. This information was used to adjust household consumption of domestic products (Array AI05). Due to the lack of cost data and in order to minimize further imbalances of the original data, the cost structure imposed for the ‘dwellings’ sector is an 80/20 percent split between capital and unskilled labor.

Three employment of labor by industry vectors are available. The first array (AI13) aggregates the three labor categories identified in the SAM. The two supplementary arrays (AI13s and AI13u) provide the labor data split as skilled and unskilled labor according to skill level. Using this definition, unskilled labor consists of employees with no education or with just primary education. Skilled labor includes employees with vocational training, secondary education and university or college degrees. Comparing the labor shares by-industry using this split with the labor shares by industry in the second pre-release version of the GTAP 5 data base, it may be noted that the splits are very similar for the food processing industries and the trade and transportation sectors, whilst there are slightly larger differences in the other sectors. For primary agriculture, for example, the unskilled /skilled labor shares are 0.94 : 0.06 using the SAM data, whilst the second pre-release version of the GTAP 5 data base shows a 0.99 : 0.01 split.

The Vietnam SAM distinguishes between three types of industry/commodity taxes by sector: (a) activity taxes (license, slaughter and agriculture taxes), (b) turnover taxes, and (c) sales taxes (special consumption taxes and ‘other taxes’ on state-owned and non-state-owned enterprises), by industry. Due to lack of more detailed information, these taxes were aggregated into non-commodity indirect taxes by industry array (array AI12) and the commodity tax arrays (arrays AI16-AI23, AI25-AI26) were left empty.

The SAM also includes commodity taxes on exports as well as import duties. These were used in arrays AI24 and AI27, respectively. In terms of other taxes, the SAM includes direct taxes, i.e. income taxes, profits taxes and factor taxes. These, however, are not accommodated in the tax arrays used in the GTAP data base.

According to Vietnamese data, land payments are made in both the crop sectors and in the forestry and fisheries sector. In the latter case, land is used for aquaculture production. This treatment was retained in the preparation of the I-O data.

Finally, the sectoral balance condition that total sales equals total costs was ascertained for each sector.

References

- GSO. 2000. *Viet Nam Living Standards Survey 1997-1998*. General Statistics Office, Hanoi.
- Nielsen, Chantal Pohl. 2001. *Social Accounting Matrices for Vietnam: 1996 and 1997*. Working Paper No. 8/2001, Danish Institute of Agricultural and Fisheries Economics (SJFI), Copenhagen.
- Robinson, Sherman and Moataz El-Said. 2000. *GAMS Code for Estimating a Social Accounting Matrix (SAM) Using Cross Entropy (CE) Methods*, TMD Discussion Paper No. 64, International Food Policy Research Institute (IFPRI), Washington, D.C.

Appendix

Table 11.G.A1 Sectors in the Vietnam Input-Output Data: Concordance to an Aggregation of GSC2

GSC2 agg	Sector Code	GTAP GSC2	Sector Code	VNM sectors	Sector Names	Sector Description
1	pdr	1	pdr	1	PADDY	Paddy
2	c_b	6	c_b	4	SUGARCANE	Sugarcane
3	otc	2	wht	2	RWRUBBER	Raw rubber
		3	gro	3	COFFBEANS	Coffee beans
		4	v_f	5	OTHCROPS	Other crops n.e.c.
		5	osd	9	IRRIGSRV	Irrigation services
		7	pfb	10	OTHAGSRV	Other agricultural services
		8	ocr			
4	lvs	9	ctl	6	PORK	Pig
		10	oap	7	POULTRY	Poultry
		11	mk	8	OTHLVPLT	Other livestock and poultry n.e.c.
		12	wol			
5	for	13	for	11	FORESTRY	Forestry
6	fsh	14	fsh	12	FISHERY	Fishery
7	col	15	col	13	COAL	Coal
8	olg	16	oil	17	OILNGAS	Crude oils, nat. gas (exc. exploration)
		17	gas			
9	omn	18	omn	14	URANIUM	Uranium and thorium
				15	METORE	Metallic ore
				16	MINERAL	Stone, other non-metallic minerals
10	mtp	19	cmt	18	PRCMEAT	Proc., preserved meat and by-prods
		20	omt			
11	vol	21	vol	19	PVAOIL	Proc. veg. & animal oils and fats
12	mil	22	mil	20	DAIRY	Milk, butter and other dairy prods.
13	sgr	24	sgr	25	REFSUGAR	Sugar, refined
14	otf	23	pcr	21	CKECHOC	Cakes, jams, candy, cocoa, choc. prods
		25	ofd	22	PFRTVEG	Proc. & pres. fruits and vegetables
				26	PRCOFFEE	Coffee, processed
				27	PRTEA	Tea, processed
				29	PRSEAFD	Processed seafood and by-products
				30	OTHFOOD	Other food manufactures n.e.c.
				67	ANIMFEED	Animal feeds
15	b_t	26	b_t	23	ALCOHOL	Alcohol, beer and liquors
				24	NALDRNK	Non-alcoholic water & soft drinks
				28	CIGTBCC	Cigarettes and other tobacco prods.

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Table 11.G.A1 Sectors in the Vietnam Input-Output Data: Concordance to an Aggregation of GSC2 (continued)

GSC2 agg	Sector Code	GTAP GSC2	Sector Code	VNM sectors	Sector Names	Sector Description
16	tex	27	tex	61	FBWEAVCLTH	Fibers, thread & cloth weaving
				63	CARPETS	Carpets
				64	WEAVTEXT	Weaving, textile embroidery
17	wap	28	wap	62	RMCLOTHES	Ready-made clothes, sheets
18	lea	29	lea	65	LEATHTAN	Products of leather tanneries
				66	LEATHGDS	Leather goods
19	lum	30	lum	34	PRWOOD	Processed wood & wood products
20	ppp	31	ppp	33	PAPER	Paper, pulp, paper prods. & byprod.
				68	PRNTACT	Printing activities ex. publishing
				70	PUBLISH	Newspapers, periodicals, books
21	p_c	32	p_c	72	GASOLINE	Gasoline
				73	LUBRICNT	Lubricants
22	crp	33	crp	39	ORGCHEM	Basic organic chemicals
				40	INORGCHEM	Basic inorganic chemicals
				41	FERTILIZER	Fertilizer
				42	PESTVETMED	Pesticides & veterinary medicine
				43	HEALTHMED	Health medicine
				44	PRCRUBBER	Processed rubber and by-products
				45	SOAP	Soap, detergent, perf., toiletries
				46	PLASTICS	Plastic, incl. semi-plastic prods.
				47	OTHPLAST	Other plastic products
				48	PAINT	Paint, ink, varnish, painting mat.
				49	OTHCHEM	Other chemical products
23	mmm	34	mmm	31	GLASS	Glass and glass products
				32	CERAMIC	Ceramics and by-products
				35	CEMENT	Cement
				36	BRICKS	Bricks, tiles
				37	CONCRETE	Concrete, mortar, cement prods.
				38	OTHBLDMT	Other building materials
24	isf	35	i_s	60	FERMETAL	Ferrous metals & prods ex.mach.
		37	fmp			
25	nfm	36	nfm	59	NFERMETAL	Non-ferrous metals and products
26	mvh	38	mvh	52	MTRVEHICL	Motor veh., motor bikes, bikes
27	otn	39	otn	56	OTHTRANS	Other transport means n.e.c.
28	ele	40	ele	57	ELECMACHN	Elec. machinery and equipment
				58	TVMCHEQUI	Mach. & equip. broadcasting, TV, IT
29	ome	41	ome	50	HLTHINST	Health instruments and apparatus
				51	OPTEQUIP	Precise and optics equipment
				53	HOMEAPPL	Home appliances & spare parts
				54	GENMACHIN	General purpose machinery
				55	SPCMACHIN	Special purpose machinery

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Table 11.G.A1 Sectors in the Vietnam Input-Output Data: Concordance to an Aggregation of GSC2 (continued)

GSC2 agg	Sector Code	GTAP GSC2	Sector Code	VNM sectors	Sector Names	Sector Description
30	omf	42	omf	69	OTHIND	Prods of other indust. activities
				71	OTHGDS	Other physical goods n.e.c.
31	ely	43	ely	74	ELECTRCTY	Electricity
32	gdt	44	gdt	75	GAS	Gas
33	wtr	45	wtr	76	WATER	Water
34	cns	46	cns	77	CONSTRCT	Construction
35	trd	47	trd	78	TRADE	Trade
				79	REPAIRS	Repairs of small transport means
				80	HOTELRES	Hotels and restaurants
36	otp	48	otp	81	LANDTRNS	Land transportation services
				82	RAILTRNS	Railway transportation services
				86	TOURISM	Tourism
37	wtp	49	wtp	83	WATRTRNS	Water transport services
38	atp	50	atp	84	AIRTRNS	Air transport services
39	cmn	51	cmn	85	COMNCSRV	Communication services
40	ofi	52	ofi	87	BNKCRDT	Banking, credit, treasury, lotto
41	isr	53	isr	88	INSURNCE	Insurance & retirement subsidy
42	obs	54	obs	89	SCITECH	Science and technology
				90	RLESTATE	Real est., business, consultancy
43	ros	55	ros	94	CLTRSPORT	Culture and sport
				96	PERSCOMMSRV	Personal & community services
				97	HHLDSRV	Household services
44	osg	56	osg	91	STATEMNG	State manage., defense, soc. sec.
				92	EDUTRAIN	Education and training
				93	HLTHCARE	Health care, social relief
				95	PARTYASSOC	Party organization, trade unions
45	dwe	57	dwe	na	na	na