

Namibia

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1. Introduction

This document describes the steps behind the creation of the first Input-Output (I-O) table of Namibia for the Global Trade Analysis Project (GTAP)¹. The GTAP I-O table for Namibia is based on a Social Accounting Matrix (SAM) for Namibia for 2004 (Lange, 2008).

2. Source Data

The data used to construct the Namibian I-O table in GTAP are based on a published SAM table (Lange, 2008). The SAM contained 32 products and 30 activities with the difference explained by the existence of direct purchases abroad by residents as a product and the non-existence of any petroleum activities (i.e. no oil refineries).

The authors converted the SAM into a 29 sector I-O table in commodity by industry format, with units in millions of local currency (Namibian dollars) at producers' prices for the year 2004. The 29 sectors are listed in Table A.1 in the appendix.

Other unpublished data from the Central Bureau of Statistics of Namibia were used to make adjustments when necessary.

3. Preparing the GTAP Namibian I-O Table

The following steps were taken in preparing the Namibian I-O table:

The SAM allowed for activities to produce more than one product – this was modified such that in the I-O table, each activity produced only one product.

The SAM contained a vector of domestic trade margins by product.

- These were incorporated back into the MAKE matrix by allocating the trade margin across three products (Trade, Hotels and Restaurants and Transport) according to proportions.

The SAM did not contain any of the following sectors – coal, gas, oil.

- There was zero production and use of gas and crude oil in Namibia in 2004. Therefore, a dummy commodity and industry were created for each in the I-O table.
- There was zero coal production in Namibia in 2004 and as such, a dummy coal industry was created in the I-O table.
- The use of coal in Namibia was limited to metal processing and electricity production. In the SAM, the use of coal by these sectors had been redistributed to the refined petroleum commodity.
 - A coal commodity was created in the I-O table using unpublished data on the value of coal imports. The use of this coal was then separated from the refined petroleum commodity such that the share of coal used by the electricity industry was similar to

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that in South Africa. The remaining coal was allocated to the metal processing sector such that the table balanced.

The SAM contained one sector called traditional agriculture (communal agriculture) and did not contain a sector called forestry:

- Unpublished data were used to split the production and use of traditional agriculture across the existing agriculture based sectors of cereals crops, other crops and livestock and a newly created sector, forestry.
- The use of land by agricultural industries was not specified in the SAM.
- In GTAP 7 (Badri and Walmsley 2008), within the aggregate cereal crop, other crop and livestock sectors in South Africa, land accounts for approximately 14 per cent of total expenditure on endowments.
- The agriculture sectors in South Africa were considered by the authors to be an appropriate proxy for the Namibian agriculture sectors.
- Thus, 14 per cent of total value added was allocated to the land primary factor in cereal crop, other crop and livestock sectors.

The share of labour by the cereal crop industry in the SAM table in total value added was approximately 2 per cent. Likewise, the share of labour in the other crop and livestock industries in total value added was approximately 8 per cent.

- The authors considered these shares to be low, especially when compared to South Africa in GTAP 7 where labor accounts for approximately 33 per cent of total expenditure on endowments in these sectors.
- The authors adjusted the payments to labor in the table such that the share of labor in total value added was approximately equal to that in South Africa.
- The payments to capital were then adjusted down such that the sum of value added was equal to the sum of value added in the original SAM table.

The SAM contained one vector that was the sum of investment and change in stocks.

- Unpublished data on inventories were used to split this vector into two vectors, one for investment and one for the change in stocks.

The vector of taxes on products was split into three vectors (one for taxes on domestic use, one for taxes on imported use and one for import tariffs) using unpublished data from the NSO.

After completing the steps described above, the authors then used the programs described within Horridge *et al.* (2008) and the GEMPACK economic modelling software (Harrison and Pearson 1996) to prepare the GTAP Namibian I-O table.

The GTAP Namibian I-O table contains 29 sectors. The mapping between the 29 sectors and the 57 GTAP sectors is given in Table 1.

4. Data Quality

The authors note they have not attempted to include the informal economy in the I-O table due to the lack of available data.

References

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- G-M. Lange (2008). *A social accounting matrix for Namibia, 2004: A tool for analyzing economic growth, income distribution and poverty*, The Namibian Economic Policy Research Unit, Windhoek.

Appendix

Table 1: Sectoral Mapping

30 sectors		Covering 57 GTAP sectors	
1	Cereal crops	1	Paddy Rice
		2	Wheat
		3	Other Grains
2	Ocrops	4	Vegetables & Fruit
		5	Oil Seeds
		6	Cane & Beet
		7	Plant Fibres
		8	Other Crops
3	Livestock	9	Cattle
		10	Other Animal Products
		11	Raw milk
		12	Wool
4	Forestry	13	Forestry
5	Fishing	14	Fishing
6	Coa	15	Coal
7	Oil	16	Oil
8	Gas	17	Gas
		44	Gas Distribution
9	Mining_ex	18	Other Mining
10	Meat_Proc	19	Cattle Meat
		20	Other Meat
11	Ofood_Proc	21	Vegetable Oils
		22	Processed Rice
		23	Sugar
		24	Other Food
		25	Milk
		26	Beverages and Tobacco products
12	Text	27	Textiles
13	Omanu	28	Wearing Apparel
		29	Leather
		30	Lumber
		37	Fabricated Metal Products
		38	Motor Vehicles
		39	Electronic Equipment
		40	Other Machinery & Equipment
		41	Other Transport Equipment
		42	Other Manufacturing
14	Paper	31	Paper & Paper Products
15	P_C	32	Petroleum & Coke

16	CRP	33	Chemical Rubber Products
17	Nmetals	34	Non-Metallic Minerals
18	Metals	35	Iron & Steel
		36	Non-Ferrous Metals
19	Ely	43	Electricity
20	Water	45	Water
21	Cns	46	Construction
22	Trade	47	Trade
23	Trans	48	Other Transport
		49	Water transport
		50	Air transport
24	Cmn	51	Communications
25	ISR	52	Other Financial Intermediation
		53	Insurance
26	Obs	54	Other Business Services
27	ROS	56	Recreation & Other Services
28	OSG	57	Other Services (Government)
29	DWE	58	Dwellings