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TMD DISCUSSION PAPER NO. 49

A 1995 SOCIAL ACCOUNTING MATRIX FOR ZAMBIA

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MACRO
ECONOMIC
REFORMS AND
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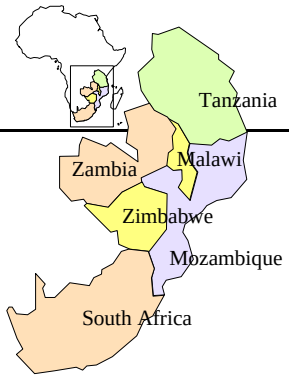
SOUTHERN
AFRICA



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Abstract

This paper documents the construction of the 1995 Social Accounting Matrix for Zambia (ZAMSAM). The SAM incorporates economy-wide data in a consistent framework and provides the benchmark data for the analysis under the MERRISA project. Data sources include national accounts data, government budgets, balance of payments statistics, trade data, household surveys, and farm budgets. The SAM construction can be divided into three steps: First, a highly aggregated SAM (macro SAM) is constructed. It represents the macroeconomic framework of the Zambian economy. Second, the macro SAM is disaggregated into a micro SAM with the macro SAM entries serving as control totals for various sub-matrices of the micro SAM. Due to data insufficiencies, the first micro SAM obtained from raw data is highly unbalanced. Thus, in a third step and after some prior adjustments, a cross-entropy approach is applied to balance the first micro SAM and generate the final estimated SAM. The result is a consistent and balanced SAM for Zambia in 1995 that comprises 28 activities, 27 commodities, 6 factors of production (4 labor categories, 1 capital, and 1 land account), 4 household types, and one account each for enterprises, government, rest-of-the-world, and investment/savings. Special features of the Zambian micro SAM include its focus on agriculture (13 agricultural commodities), the consideration of non-monetary, own-household consumption, and the separation of marketing margins on domestic products, exports, and imports.

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List of Abbreviations

BOZ	Bank of Zambia
CGE	Computable general equilibrium
C.I.F.	Cost, insurance and freight
CIP	Census of industrial production
CSO	Central Statistical Office
EBZ	Export Board of Zambia
F.O.B.	Free on board
FSAM	Financial social accounting matrix
GDP f.c.	Gross domestic product at factor cost
GDP m.p.	Gross domestic product at market prices
GFCF	Gross fixed capital formation
GTAP	Global trade analysis project
HBS	Household budget survey
HS	Harmonized tariff system
IIP	Index of industrial production
IFPRI	International Food Policy Research Institute
I-O	Input-output
ISIC	International standard industrial classification
LCMS	Living conditions monitoring survey
MAFF	Ministry of Agriculture, Food and Fisheries (ROZ)
MCT	Ministry of Commerce, Trade and Industries (ROZ)
MERRISA	Macroeconomic reforms and regional integration in Southern Africa
MOF	Ministry of Finance (ROZ)
MOPAM	Multiple objective policy analysis matrix
NA	National Accounts
NII	National income inquiry
ROZ	Republic of Zambia
PHS	Post-harvest survey
PS I (II)	Priority survey I (II)
ROW	Rest-of-the-world
SAM	Social accounting matrix
SITC	Standard international trade classification
VA	Value-added
VAT	Value-added tax
ZAMSAM	1995 Social accounting matrix for Zambia
ZK	Zambian Kwacha
ZNFU	Zambia National Farmer's Union

1. Introduction

As part of the Zambia country study performed under the IFPRI research project on Macroeconomic Reforms and Regional Integration in Southern Africa (MERRISA), a 1995 social accounting matrix (SAM) for Zambia (ZAMSAM) has been constructed.[1] A SAM is a square matrix that describes quantitatively the economic transactions taking place in an economy during a specified period of time.[2] It consists of row and column accounts that represent the different activities, commodities, agents and institutions of an economy at a chosen level of disaggregation. By convention, each cell of the matrix represents a payment from the column account to the row account. The underlying principle of double-entry accounting requires that row totals equal column totals for each account in the SAM.

The data for the agriculture-focused Zambian SAM in 1995 has been drawn from various sources including input-output tables, national accounts, government budgets, trade data, balance of payments statistics, and household surveys. Agricultural input technologies and input flows are derived from farm budgets and a rapid assessment of commercial agricultural production in 1994/95.

The SAM construction can be divided into three steps: First, a highly aggregated SAM (macro SAM) is constructed. It represents the macroeconomic framework of the Zambian economy in 1995. Second, the macro SAM is disaggregated into a micro SAM. Its sub-matrices are constructed from various data sources with macro SAM entries serving as control totals for the adjustment of the raw data. Due to data insufficiencies, the first micro SAM (the "proto SAM") obtained from raw data is still highly unbalanced. Thus, after some prior adjustments in order to facilitate the solution process, a cross-entropy approach is applied in a third step, with the proto SAM providing the "prior" for the parameter estimation and the macro SAM entries serving as constraints. This estimation procedure generates the balanced micro SAM for Zambia in 1995. It constitutes the database for computable general equilibrium (CGE) modeling within the MERRISA project.

The Zambian micro SAM differentiates accounts for 28 activities, 27 commodities, four labor categories plus value-added (VA) capital and VA land, four households, the

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[1] The MERRISA project consists of five country studies on Malawi, Mozambique, Tanzania, Zambia, and Zimbabwe and a trade focused regional component. Social accounting matrices are constructed for each of the six countries. Based on these data sets economy-wide analyses are performed for each of these countries, using computable general equilibrium (CGE) modeling. A trade-focused regional component including South Africa has assembled a comprehensive database on regional trade flows and analyzes opportunities and consequences for extended regional integration (Mukherjee and Robinson, 1997).

[2] See Pyatt and Round (1985) for a general discussion of the SAM structure and concept. See de Melo (1988), Pyatt (1988), and Robinson and Roland-Holst (1988) for introductions to SAM-based modeling.

government, the rest-of-the-world (ROW), and the saving/investment account. It has an agricultural focus, with 14 out of the 28 activities belonging to agriculture (including forestry and fisheries). To facilitate the analysis of the linkage effects, the activities are further separated into mining and quarrying, three labor-intensive light manufacturing, three manufacturing, one construction and seven service sectors. Light manufacturing includes food and beverages, textiles and garments, and wood, paper and furniture. These are the sectors that are directly linked to agriculture by using agricultural outputs as inputs into their own production processes. In addition, the fertilizer and basic chemicals industry and the capital goods industry are separated from other manufacturing. They provide the main inputs to agricultural production.

As special features, the micro SAM incorporates consumption of own-farm production and separates marketing margins on sales of domestic goods, exports and imports. In addition, the maize commodity is produced by two different technologies (and thus activities): the commercial maize technology and small-scale and emergent maize technology.

Earlier work on SAMs for Zambia was done by Adam (1995a), Katepa-Kalala (1996), and Adam and Bevan (1996). The data from the latter benefited this research project. The most recent input-output tables available were the unpublished 1985 input-output tables for Zambia. Work on the publication of official 1994 input-output tables by the Central Statistical Office in Lusaka is still in progress. Meanwhile, the 1995 ZAMSAM uses the input structure of the 1985 input-output table with substantial adjustments based on other information. Adjustments are most substantial in agriculture, where input technologies were derived from farm budgets for disaggregation and updating purposes.

Zambia started to engage in macroeconomic reforms and structural adjustments after the election of the new MMD government in fall of 1991. Coinciding with these efforts were three droughts, one major drought in 1991/92, and two minor ones in 1993/94 and 1994/95. They seriously affected the supply response to policy changes, especially in agriculture. Nevertheless, 1995 was chosen as the benchmark year for the Zambian SAM for the following reasons: First, the 1993/94 drought affected agriculture much less than the previous two. Second, 1995 was the first year in which most of the liberalization programs were in place. Third, the supply of inputs as well as the processing and marketing of outputs began to be dominated by the private sector. Fourth, national accounts, government, trade and other data are far more reliable in 1995 than at the beginning of the reform period.[3] Fifth, 1995 is the benchmark year for the Oxford Financial SAM (Adam and Bevan, 1996), which is useful with respect to data availability and comparison.

[3] McPherson (1995) characterizes most of Zambia's macroeconomic data in 1992 as being "months out of data" and "unreliable".

This paper is organized as follows. Section 2 describes the construction of the Zambian macro SAM for 1992, lists the data sources, and documents the derivation of the various SAM entries. Section 3 discusses data sources and the construction procedure of the first unbalanced micro SAM – also called proto SAM. It presents the cross-entropy technique used for balancing the proto SAM and discusses some figures and indicators of the final micro SAM.

2. A macroeconomic social accounting matrix for 1995

The Zambian macroeconomic social accounting matrix (macro SAM) for the year 1995 is composed of 24 non-zero entries. The gross output level (total cost of production) of the initial macro SAM balances at ZK 5,775,876 million and the total absorption (including total marketing margin and exports) at ZK 7,802,380 million. These numbers include an initial trade deficit of ZK 145,894 million, which amounts to 13.5 percent of total export earnings.

The construction of the macro SAM starts from National Accounts data (ROZ, 1998b). This data was re-compiled in the form of income-expenditure balance sheets and is presented in Table 1. Unfortunately, Zambian national accounts give little information on government income and expenditure or private and public savings. Hence, they were supplemented by other data sources. The next section provides a list of data sources and explanatory publications used in the construction of the macro SAM. The structure and values of the macro SAM for 1995 are presented in Tables 2 and 3. Their cell entries are documented in the following section.

2.1 Data sources for the macro SAM

The following lists the data sources used in the construction of the macro SAM for 1995. The derivation of its cell entries is documented in the next section.

1993/94 Household Budget Survey:

ROZ (Republic of Zambia). 1996. Household budget survey 1993/94. Volume 3, Main tables and report, Total household consumption, employment and income. Lusaka, Zambia: Central Statistical Office.

1995 Balance of Payments Statistics:

IMF (International Monetary Fund). 1997a. Zambia - Selected issues and statistical appendix. IMF Staff Country Report No. 97/118. Washington, D.C.: International Monetary Fund.

1995 Domestic Budget:

ROZ (Republic of Zambia). 1997b. Macroeconomic indicators, July 1997. Lusaka, Zambia: Ministry of Finance and Economic Development.

1995 National Accounts:

ROZ (Republic of Zambia). 1998b. National accounts statistics: Preliminary estimates of gross domestic product 1997. Lusaka, Zambia: Central Statistical Office. Mimeo.

1995 Oxford Financial SAM:

Adam, C.S. and D. Bevan. 1996. A financial social accounting matrix for Zambia. Center for the Study of African Economies, University of Oxford, England. Mimeo.

Definitions and concepts for the macro SAM are taken from the following sources:

Adam, C.S. 1995a. Constructing a model-focused social accounting matrix using 1985 input output and national account income data. Center for the Study of African Economies, University of Oxford, England. Mimeo.

_____. 1995b. Zambia - 1985 input-output tables, national accounts data, and SAM. Center for the Study of African Economies, University of Oxford, England. Computer files.

IMF (International Monetary Fund). 1997b. Balance of payments statistical yearbook. Part 1, Country Tables. Washington, D.C.: International Monetary Fund.

_____. 1997d. Government finance statistics yearbook. Washington, D.C.: International Monetary Fund.

ROZ (Republic of Zambia). 1997c. National income statistics: Sources and methods. Vol. 1, Benchmark estimates, 1994. Lusaka, Zambia: Central Statistical Office.

_____. 1997d. National income statistics: Sources and methods. Vol. 2, Preliminary report. Lusaka, Zambia: Central Statistical Office.

World Bank. 1998. World development indicators: 1998. Washington, D.C.: The World Bank. CD-ROM.

2.2 Documentation of the macro SAM cell entries

The notation for the macro SAM cell entries is: **[row account, column account]**. The cell entries represent an expenditure from the column account and income to the row account. All values are in millions of ZK, unless otherwise stated.

Table 1: Zambia national income statistics balance sheets for 1995 (K' Mill)

GDP	Income		Expenditure
Compensation of employees	936,205.0	Government final consumption	464,049.0
Gross operating surplus (1)	1,703,009.0	Private final consumption	2,202,250.0
		Gross fixed capital formation	373,104.0
Net indirect taxes	359,108.0	Increase in stocks	104,813.0
		Exports of goods and services	1,082,341.0
		Less: Imports of goods and services	-1,228,235.0
Total (GDP m.p.)	2,998,322.0	Total (GDP m.p.)	2,998,322.0
National Disposable Income	Income		Expenditure
Compensation of employees	936,205.0	Government final consumption	464,049.0
Gross operating surplus	1,703,009.0	Private final consumption	2,202,250.0
Net indirect taxes	359,108.0	Savings	76,900.0
Compensation of employees from ROW (net)	n/a		
Property and entrepreneurial income from ROW (net)	-237,723.0		
Current transfers from ROW (net)	-17,400.0		
Total	2,743,199.0	Total	2,743,199.0
Capital Accounts	Income		Expenditure
Gross savings	76,900.0	GFCF (Investments)	373,104.0
Current account deficit	401,017.0	Increase in stocks	104,813.0
Total	477,917.0	Total	477,917.0
Rest of World	Income		Expenditure
Imports of goods and services	1,228,235.0	Exports of goods and services	1,082,341.0
Compensation of employees to ROW	n/a	Compensation of employees from ROW	n/a
Property and entrepreneurial income to ROW (net)	237,723.0		
Other current transfers to ROW (net)	17,400.0		
Surplus on current account to ROW (net)	-401,017.0		
Total	1,082,341.0	Total	1,082,341.0
Note:			
(1) Including consumption of fixed capital.			

Source: Constructed from National Accounts data (ROZ, 1998b).

Table 2: Zambia The structure of the macroeconomic social accounting matrix

	Activities	**Commodities**	**Factors**	**Households**	**Enterprises**	**Government**	**ROW**	**Capital Account**	**Total**
Activities		Marketed Production		Own-household Consumption					**Total Domestic Production**
Commodities	Intermediate Demand	Marketing Margins		Final Household Consumption		Final Government Consumption	Exports (f.o.b,)	Investments	**Total Factor Income**
Factors	Value Added (at f.c.)								**Total Enterprise Income**
Households			Labor Income (VA Labor)		Retained Earnings	Government Transfers and Pensions			**Total Household Income**
Enterprises			Capital Income (VA Capital)			Government Domestic Interest			**Total Enterprise Income**
Government	Value Added Tax	Other Indirect (Excise, Import) Taxes		Individual Income Tax	Corporate Tax				**Total Government Income**
ROW		Imports (c.i.f.)		Other Current Transfers to ROW	Property and Entrepreneurial Income to ROW				**Total Foreign Exchange Outlays**
Capital				Household Savings	Enterprise Savings	Government Savings	Foreign Savings		**Total Savings**
Total	**Total Cost of Production**	**Total Absorption**	**Total Value Added**	**Total Household Expenditure**	**Total Enterprise Expenditure**	**Total Government Expenditure**	**Total Foreign Exchange Earnings**	**Investment**	

Table 3: Zambia - Macroeconomic social accounting matrix for 1995 (in ZK Mill)

	Activities	Commodities	Factors	Households	Enterprises	Government	ROW	Capital Account	Total
Activities		5,295,111		521,601					**5,816,712**
Commodities	3,068,712	965,489		1,680,649		464,049	1,082,341	477,917	**7,739,157**
Factors	2,639,214								**2,639,214**
Households			1,387,038		911,509	106,997			**2,405,544**
Enterprises			1,252,176						**1,252,176**
Government	108,786	250,322		134,153	56,309				**549,570**
ROW		1,228,235		17,400	237,723				**1,483,358**
Capital Account				51,741	46,635	-21,476	401,017		**477,917**
Total	**5,816,712**	**7,739,157**	**2,639,214**	**2,405,544**	**1,252,176**	**549,570**	**1,483,358**	**477,917**	

1. Intermediate demand [commodities, activities]: 3,068,712. Total intermediate demand, which is assumed to include imported intermediate inputs, tariffs and marketing margins, is obtained from aggregating intermediate inputs in the *1995 Oxford Financial SAM*. The resulting value is adjusted with the ratio of total value added from the *1995 National Accounts* and the *1995 Oxford Financial SAM*.

2. Value added at factor cost [factors, activities]: 2,639,214. Total value added at factor costs from *1995 National Accounts* equals the sum of compensation of employees and gross operating surplus (including consumption of fixed capital).

3. Value added tax [government, activities]: 108,786. In 1995, Zambia introduced a value added tax system, which replaced domestic sales taxes. It is derived from net indirect taxes in the *1995 National Accounts* by use of the share of domestic sales plus value added tax in total indirect taxes as provided by the *1995 Domestic Budget* data. The sum of value added tax plus other indirect taxes (excise tax and import tariffs) equals net indirect taxes as in the *1995 National Accounts*.

4. Marketed production [activities, commodities]: 5,295,111. Marketed production (marketed supply) is a residual obtained from subtracting own-household consumption (activities, households) from total cost of production (gross output). It includes goods and services produced for export. Marketed supply is subject to marketing margins.

5. Marketing margins [commodities, commodities]: 965,489. Total marketing margins are computed from the first unbalanced micro SAM as the sum of trade and transport margins associated with marketing domestic, exported and imported goods and services. See Section 3.3 for a discussion of the marketing margins.

6. Other indirect taxes [government, commodities]: 250,322. Other indirect taxes are composed of excise taxes and import tariffs. They are derived from net indirect taxes in the *1995 National Accounts* by applying the share of the excise tax plus the import tariff in total indirect taxes as provided by the *1995 Domestic Budget*. The sum of the value added tax plus other indirect taxes (excise tax and import tariffs) equals net indirect taxes as in the *1995 National Accounts*.

7. Imports of goods and services [ROW, commodities]: 1,228,235. Total imports of goods and services as provided by the *1995 National Accounts* data.

8. Labor income [households, factors]: 1,387,038. Labor income (value added labor) has been computed as the residual of total GNP (value added) at factor cost and the adjusted capital income figure discussed below. Compensation of employees in the *1995 National Accounts* suggests that the level of labor income equal 936,205 and capital income 1,703,009. This would be typical for a fairly capital intensive economy. We adjust value-added labor upward by 450,833 (48%) in order to account for value added generated by the consumption of own household production. This is in contrast to the 1995 *National Accounts* data and documentation (ROZ, 1997c and 1997d), which claim

to have captured own consumption in their GDP estimates. See Section 3.3 for a more detailed discussion of the value-added structure.

9. Capital income [enterprises, factors]: 1,252,176. Gross operating surplus figure including consumption of fixed capital from the *1995 National Accounts* data equals 1,703,009. We estimate capital income (value added capital) at 1,252,176. This estimate is derived from careful analysis and adjustment of the micro SAM value added structure in Zambia in 1995 with adjustments paralleling the labor-capital ratios in other country studies in the MERRISA project as well the GTAP database (Hertel, 1999). See Section 3.3 for a more detailed discussion of the value-added structure.

10. Own-household consumption [activities, households]: 521,601. Own-household consumption is derived from the 1993/94 *Household Budget Survey (HBS)* and netted out from the final household consumption figure as in the *1995 National Accounts*. Total average monthly value of own produce consumption from the *1993/94 HBS* is ZK 17,260. With the total number of households in Zambia at 1,819,600 (*1993/94 HBS*) and a consumer price index for 1994 at 1.384 (IMF, 1997a) this amounts to an estimated annual own-household consumption value in 1995 of ZK 521,601 million.

11. Final household consumption [commodities, households]: 1,680,649. Final household consumption is taken from the *1995 National Accounts* data adjusted for estimated own-household consumption. From the discussion of the benchmark estimates for 1994 (ROZ, 1997c and 1997d) it follows that own-household consumption is accounted for in final household consumption expenditure. Hence, in the macro SAM own-household consumption is netted out of final household consumption.

12. Individual income tax [government, households]: 134,153. Individual income tax is composed of pay-as-you-earn (PAYE) and other income taxes as provided by the *1995 Domestic Budget*.

13. Individual factor income to ROW [ROW, households]: 17,400. In the *1995 National Accounts* data other current transfers from ROW (net) are negative. They are assumed to be factor payments from individual households to the ROW.

14. Household savings [savings, household]: 51,741. The 1995 National Accounts only report a figure for total (gross) savings. In 1995 it was reported at a level of ZK 76,900 million. Total household savings are calculated as a balancing item to equilibrate total household expenditure (column sum) with total household income (row sum). It is 3.1 percent of the final household cash consumption.

15. Retained earnings [household, enterprises]: 911,509. Retained earnings are computed as enterprise income minus other enterprise payments. Enterprises receive capital income (gross operating surplus in the *1995 National Accounts* minus adjustments) and transfer payments from the government. They pay corporate taxes to the government, transfer money abroad, and accumulate savings.

16. Corporate taxes [government, enterprises]: 56,309. Corporate taxes are composed of company income taxes plus mineral revenue as provided by the *1995 Domestic Budget* data.

17. Enterprise (factor) payments to ROW [ROW, enterprises]: 237,723. The *1995 National Accounts* report property and entrepreneurial income from ROW (net) as a negative number. Hence, these are payments from enterprises to the ROW.

18. Enterprise savings [savings, enterprises]: 46,635. Enterprise savings are a residual figure balancing enterprise income and expenditure.

19. Government final consumption [commodities, government]: 464,049. Government final consumption matches the corresponding expenditure figure in the *1995 National Accounts*. A comparison of the *1995 National Accounts* figure with details on government expenditure in the *1995 Domestic Budget* data leads to the conclusion that only transfers and pensions and the government deficit have to be added to the government expenditure column of the macro SAM. (See macro SAM, Sections 20 and 21 below.)

20. Government transfers and pensions [households, government]: 107,411. Transfers and pensions are excerpted from the *1995 Domestic Budget*.

21. Government savings [savings, government]: -21,890. Government savings are computed as a residual such that the sum of private savings, enterprise savings, and government savings equals total (gross) savings in the *1995 National Accounts*: 76,900.

22. Exports of goods and services [commodities, ROW]: 1,082,341. Exports of goods and services are extracted from the *1995 National Accounts* data.

23. Foreign savings [savings, ROW]: 401,017. Foreign savings are not explicitly stated in the *1995 National Accounts*. They are calculated as a residual within the capital account. They balance capital expenditures (the sum of gross fixed capital formation, GFCF, plus increases in stocks) with capital income (gross savings plus current account deficit).

24. Investments [commodities, investments]: 477,917. Total investments are the sum of GFCF plus increases in stocks in the *1995 National Accounts* data. They are assumed to include private and public capital formation.

3. A microeconomic social accounting matrix for 1995

This section discusses the data, assumptions and adjustments used in the construction of the unbalanced micro SAM ("proto SAM"). It also introduces the cross-entropy approach for estimating the final 1995 micro SAM for Zambia (ZAMSAM). The documentation of the proto SAM construction follows the structure of the macro SAM documentation. The numbering and notation used for the discussion of the proto SAM are the same as for the macro SAM. Often, a macro SAM entry is disaggregated into a vector or matrix of the proto SAM by use of other data sources. First, shares are constructed from the raw data and, second, these shares are applied to the macro SAM entry (that is, to the control total).

3.1 The structure of the micro SAM

In the micro SAM the activity and commodity account of the macro SAM is disaggregated into 28 activities and 27 commodities (see Table 4). For maize, the micro SAM distinguishes two activities producing the same commodity. Three additional "commodity" accounts capture different marketing margins for exports, imports and domestic goods. The disaggregation is based on the *31-Sector 1985 Oxford Input-Output Table* (Adam, 1995b) with supplementary information from the *56-Sector 1985 CSO Input-Output Table* (Adam, 1995b, and ROZ, 1997a), the *1995 National Accounts* (ROZ, 1998b), and other data sources.

The Zambian micro SAM has an agricultural focus, with 14 out of 28 activities belonging to agriculture (including *forestry* and *fisheries*). These are *small/emergent maize* and *commercial maize*, Zambia's main crop activities, *drought-tolerant staples*, export crop activities (*coffee*, *cotton*, *groundnuts*, *horticulture*, *sugar*, and *tobacco*), *wheat*, *other crops*, and *livestock*. To facilitate the analysis of the linkage effects, the non-agricultural activities are separated into *mining and quarrying*, three labor-intensive light manufacturing, three manufacturing, one construction and six service activities. Light manufacturing includes *food, beverages, and tobacco*, *textiles and garments*, and *wood, paper, and furniture*. These are the sectors that are directly linked to agriculture by using agricultural outputs as inputs into their own production process. In addition, the *fertilizer, pesticides, and basic chemicals* industry and the *capital goods* industry are separated from *other manufacturing*, as they provide main inputs to agriculture. Important service inputs into agriculture originate from *trade and transportation services*, *finance services* and *other services* activities.[4]

Other accounts of the micro SAM are 27 commodity plus three marketing margin accounts, seven labor, two value added capital and one land accounts, four household

[4] For a definition of the micro SAM activities refer to Appendix Table A2.

Table 4: Accounts of the 1995 ZAMSAM

Account Type	Acc. No.	Account Code	Description
Agricultural Activities	1	ASMA	Maize, small and emergent
	2	ALMA	Maize, commercial
	3	ASTA	Drought-tolerant staples
	4	AGNT	Groundnuts
	5	ASUG	Sugar
	6	ACOT	Cotton
	7	ATOB	Tobacco
	8	ACOF	Coffee
	9	AWHE	Wheat
	10	AHCR	Horticulture crops
	11	AOCR	Other crops
	12	ALIV	Livestock products
	13	AFIS	Fisheries
	14	AFOY	Forestry
Non-Agricultural Activities	15	AMIN	Metal mining
	16	AFBT	Food, beverages, and tobacco
	17	ATAG	Textiles and garments
	18	AWAF	Wood, furniture, and paper
	19	AFER	Fertilizer, pesticides, and basic chemicals
	20	AOMA	Other manufactures
	21	AEAW	Energy
	22	ACAG	Capital goods
	23	ACON	Construction
	24	ATSV	Trade and transportation services
	25	ATOU	Tourism
	26	ASER	Other market services
	27	AFIN	Finance
	28	APUB	Public non-market services
Commodities	29	CMAI	Commodities have the same sector disaggregation as
	30	CSTA	activities, except for maize. Two different activities,
	…	…	ASMA and ALMA, produce the same commodity
	55	CPUB	maize, CMAI.
Marketing Margins	56	CMME	Export marketing margins
	57	CMMI	Import marketing margins
	58	CMMD	Domestic marketing margins
Factors of Production	59	LNONE	"Unskilled" labor (1)
	60	LPRIM	Labor with "primary education"
	62	LSECO	Labor with "secondary education" (2)
	63	LPOST	Labor with "post secondary education" and "degree"
	64	KAP	Capital
	65	LAND	Agricultural Land

(continued …)

(… continued)			
Households	66	HHMH	Household metropolitan high income
	67	HHML	Household metropolitan low income
	68	HHNU	Household non-metropolitan urban
	69	HHNR	Household non-metropolitan rural
Other Institutions (Tax Accounts)	70	ENT	Firms/Enterprises
	71	GOVR	Government Recurrent
	72	DIRTX	Direct taxes
	73	VATAX	Value added tax
	74	INDTX	Indirect taxes
	75	TARIFFS	Tariffs (import taxes)
	76	WORLD	Rest-of-the-World (ROW)
	77	KACCOUN	
Note: (1) Includes all people with "none" (no) education. (2) Includes "junior and senior" secondary education.			

accounts, the government, the rest of the world (ROW), and the saving/investment account. Taxes are collected and transferred to the government by four separate tax accounts. The disaggregation of labor into seven categories follows the distribution of academic qualifications (*none*, *primary*, *secondary* and *post-secondary* education) in *Priority Survey I* (*PS I*), *Priority Survey II* (*PS II*), and the *Living Conditions Monitoring Survey* (*LCMS*). The disaggregation of households follows the socio-economic group categories in the *1993/94 Household Budget Survey*, with non-metropolitan households broken down into urban and rural households (*metropolitan high income*, *metropolitan low income*, *non-metropolitan urban*, and *non-metropolitan rural* households).[5] The other institutional accounts of the micro SAM follow the account structure of the macro SAM.

[5] Due to data restrictions of the two priority surveys (PS I and II), the HBS 1993/94, and the LCMS, this study has to settle for the four household types listed above. Given the socio-economic conditions in Zambia this is clearly a compromise. Ideally, one would like to distinguish the following six household types:

Rural Households
small-scale farm households
medium-scale (emergent) farm households
large-scale (commercial) farm households
non-agricultural rural households

Urban Households
unskilled urban households (low cost)
skilled urban households (medium cost, high cost)

A distinction between farm households lying close to the rail system and in more remote areas might also be appropriate.

3.2 Main data sources for the micro SAM

The following lists the main data sources used in the construction of the micro SAM for 1995. The derivation of its cell entries is documented in the next section.

1985 31-Sector Oxford Input-Output Table:

Adam, C.S. 1995b. Zambia - 1985 input-output table, national accounts data, and SAM. Center for the Study of African Economies, University of Oxford, England. Computer files.

1985 56-Sector CSO Input-Output Table:

ROZ (Republic of Zambia). 1997a. A 56-Sector 1985 input-output table for Zambia. Lusaka, Zambia: Central Statistical Office. Unpublished data sheet.

1993 Priority Survey II:

ROZ (Republic of Zambia). 1994. Social dimension of adjustment, Priority survey II, 1993. Tabulation report. Lusaka, Zambia: Central Statistical Office.

1993/94 Household Budget Survey:

ROZ (Republic of Zambia). 1995b. Household budget survey 1993/94. Volume 2, Consumer price index weights and individual products, Cash consumption expenditures. Lusaka, Zambia: Central Statistical Office.

_____. 1996. Household budget survey 1993/94. Volume 3, Main tables and report, Total household consumption, employment and Income. Lusaka, Zambia: Central Statistical Office.

1995 Agricultural Comparative Advantage Data Set:

Keyser, J.C. 1996b. Zambia's agricultural comparative advantage: Database. Institute for Economic and Social Research, University of Zambia. Computer files.

1995 Domestic Budget:

ROZ (Republic of Zambia). 1997b. Macroeconomic indicators, July 1997. Lusaka, Zambia: Ministry of Finance and Economic Development.

1995 National Accounts:

ROZ (Republic of Zambia). 1998b. National accounts statistics: Preliminary estimates of gross domestic product 1997. Lusaka, Zambia: Central Statistical Office. Mimeo.

1996 Living Conditions Monitoring Survey:

ROZ (Republic of Zambia). 1998a. Living conditions monitoring survey report, 1996. Lusaka, Zambia: Central Statistical Office.

3.3 Documentation of data entries in the micro SAM

This section discusses the data sources, adjustments and assumptions of the micro SAM entries. The discussion follows the structure of the macro SAM documentation. For each corresponding cell of the macro SAM, the micro SAM either presents the same data entry or a matrix (vector) of corresponding data entries derived from raw data and structural information for data disaggregation and adjustment.

1. Intermediate demand [commodities, activities]: Data for this sub-matrix of the micro SAM stems from four main sources: the *1985 31-Sector Oxford Input-Output Table*, the *1985 56-Sector CSO Input-Output Table***,** the *1995 National Accounts* data, and the *1995 Agricultural Comparative Advantage Data Set*. The Central Statistical Office in Lusaka is preparing the publication of 1994 input-output tables for Zambia. Unfortunately, this set of input-output tables was not available for the purpose of this study. Hence, the 1995 ZAMSAM uses the input structure of the 1985 input-output tables with adjustments and extensions based on various other sources. The latter are most substantial in agriculture, where input technologies are derived from farm budgets extracted from the *1995 Agricultural Comparative Advantage Data Set*. The *1995 National Accounts* supplied data on sectoral GDP at factor cost, which are used as control totals for the updating procedure.

The sectoral intermediate demand and value-added structure (see Micro SAM, Section 2) for non-agricultural sectors plus fisheries and forestry are derived from the *1985 31-Sector Oxford Input-Output Table* plus the *1985 56-Sector CSO Input-Output Table*. The 31-sector Oxford table is an adjusted version of the 29-sector 1985 Input-Output Table for Zambia (Mwanawina, 1995). It reports intermediate input demand inclusive of domestic and imported inputs plus tariffs. Agriculture is presented as two sub-sectors, non-commercial and commercial agriculture. For the purpose of this interim step, they are aggregated into a single sector. The 56-sector CSO table is utilized to separate *fisheries* and *forestry* from agriculture, and *fertilizer, pesticides and basic chemicals* from chemical manufacturing. The resulting 34-sector input-output table is then aggregated to an interim input-output table. It is updated to 1995 by scaling all entries with the ratio of total value-added in the interim input-output table to total GDP at factor cost in the *1995 National Accounts.*

Since the focus of the present study is on agriculture, the agricultural intermediate input and value added coefficients are derived from a set of farm budgets, which are extracted from the *1995 Agricultural Comparative Advantage Data Set.* This data set is supplemented by additional budgets for livestock and cassava. Table A3 in the Appendix lists all budgets that are included in the construction of the input coefficients for agricultural sub-sectors. In some cases, budgets for a single agricultural sector of the ZAMSAM are distinguished by type of crop or livestock, production technology (small-scale, emergent, and commercial), and by location. Their respective estimated shares in the sector's total production by hectare (crops) or value (livestock) are used as weights in

the aggregation of these budgets.[6] The resulting coefficients for intermediate inputs and value added (see next section) are then applied to the estimated gross output for agricultural sectors in the ZAMSAM and adjusted such that the sum of sub-sectoral value added equals agricultural GDP at factor cost in the *1995 National Accounts* data.

Initial estimates for the structure of intermediate demand of crop and livestock commodities by non-agricultural commodities are taken from the 1991 Social Accounting Matrix for Zimbabwe (Thomas and Bautista, 1999). Coefficients for intermediate inputs from agriculture into non-agriculture are aggregated to the Zambian sector specifications and applied to the corresponding value of total intermediate input from aggregate agriculture in the interim input-output table. The initial estimates are subsequently adjusted in order to balance the demand and supply of commodities.

After some further adjustments in connection with the balancing procedure, total intermediate input demand amounts to ZK' Mill 3,027,876. The adjustments are discussed in section 3.4.

2. Value added at factor cost [factors, activities]: The data for this sub-matrix of the micro SAM is taken from the *1995 National Accounts*, the *1985 31-Sector Oxford Input-Output Table*, the *1985 56-Sector CSO Input-Output Table*, the *1995 Agricultural Comparative Advantage Data Set*, and four tables on sectoral employment and average earnings by labor categories (academic qualification). The latter tables were extracted for the purpose of this study from the disaggregated *1993 Priority Survey II* data set by researchers at the Central Statistical Office in Lusaka.

The shares for non-agricultural (including fisheries and forestry) sectoral labor and capital value-added are derived from the *1985 31-Sector Oxford Input-Output Table* and the *1985 56-Sector CSO Input-Output Table* as described in Section 1 above. The sectoral value-added labor is spread over the four labor categories of the ZAMSAM (LNONE, LPRIM, LSECO, and LPOST) by use of the sectoral employment and average wage tables extracted from the *1993 Priority Survey II* (see Tables A4 to A7 in the Appendix). Of the six categories for academic qualification in the four employment and income tables, junior and senior secondary education are aggregated into secondary education (LSECO), and diplomas, certificates, and degrees are aggregated into post secondary education (LPOST). Missing values on employment or average wages are inserted by assuming the employment or wage structure of comparable sectors (e.g., wages in tourism and trade services are assumed to be alike).

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[6] Data on the magnitude of commercial farm production in Zambia in 1995 either does not exist or is unreliable. Estimates were produced for the purpose of this study on the basis of a rapid assessment of Zambia's commercial farm sector (Keyser, 1997). These estimates were derived from a series of informal interviews with farmers, farmers' representatives, processors, commodity traders and others working in commercial agriculture. Commercial crop production in 1994/95 was estimated at ZK' Mill 82,995, commercial livestock production at ZK' Mill 66,755 (Keyser, 1997).

The sectoral value-added capital is derived as the sum of operating surplus and consumption of fixed capital given by the *1985 31-Sector Oxford Input-Output Table* and the *1985 56-Sector CSO Input-Output Table*.

For crop and livestock sub-sectors sectoral value-added components are derived from the *1995 Agricultural Comparative Advantage Data Set*.[7] Land is assumed to receive factor payments only from crop activities. The crop and livestock budgets give detailed information on capital and labor costs. The latter include payments to unskilled labor (permanent and casual), and skilled labor, e.g. managers, supervisors, and drivers. They do not account for payments to the farm owner or to land. Hence, profits (gross margins) occurring in the production of crops and livestock are allocated to labor and to land with an initial 60 to 40 percent spread. Payments to labor are allocated to the labor category with primary education. This accounts for the fact that most agricultural production takes place in rural areas with rather low educational levels. In cases where payments to hired "skilled" labor (e.g., payments to managers and supervisors) from the farm budget data are allocated to labor with secondary education in the SAM, payments to farm owners are added to the same labor category.

Finally, the shares for sectoral labor, capital, and land payments are applied to sectoral GDP f. c. from the *1995 National Accounts*. It assures that the sectoral structure and the level of total GDP f.c. from the 1995 National Accounts is maintained, while the intra-sectoral structure of value-added labor, capital, and land reflects technologies in 1985.

3. Value added tax [government, activities]: Recent information on the structure of tax payments by sectors does not exist in Zambia. The *31-Sector Oxford Input-Output Table* provides an analysis of the sectoral indirect tax structure for Zambia, but for 1985. In 1995, Zambia introduced a value-added tax system, which substituted domestic sales taxes. Nevertheless, value added taxes for non-agricultural sectors (including fisheries and forestry) have to be calculated from sectoral domestic sales tax shares as derived from the *31-Sector 1985 Oxford Input-Output Table*.[8] They are applied to the total of value-added taxes in the 1995 National Accounts (see macro SAM, Section 3).

4. Marketed production [activities, commodities]: With the exception of the commodity column for maize, each commodity account has nonzero entries on the main diagonal of this sub-matrix only. This assumes that each activity produces exactly one

[7] This data set is discussed in Keyser (1996a).

[8] This approach not only assumes that the structure of taxes paid by various sectors in the economy stays constant over time, but that the shift from a sales tax or turnover tax to a VA tax has no impact on the sectoral tax base. The data also implies that agricultural crop and livestock activities either do not pay or are exempt from paying VA taxes.

good. This good is supplied exclusively to its own commodity market. [9] The commodity maize is produced by multiple technologies. There is maize production by small-scale and emergent farmers (ASMA) and by commercial farmers (ALMA). Both are delivered to the commodity market for maize. All entries in this section are calculated as the respective sector's domestic production net of the sectoral own-household consumption. Since in the design of this SAM exports are accounted for as commodity exports, they are included in marketed production.

5. Marketing margins [commodities, commodities]: Three marketing margin accounts are introduced, which capture the trade and transport costs associated with marketing the respective commodity for domestic or export use, or to import it for domestic demand. These accounts buy services (commodities) from the trade and transport service sector. Each commodity, in turn, buys the trade and transport services associated with marketing their goods from the three marketing accounts.

The available input-output tables for Zambia show transport and trade services as two separate sectors with relatively low values for intermediate and high values for final demand of these services. Final demand in the ZAMSAM is derived from household budget data, which values consumption in terms of consumer prices including transport and trade margins, and shows relatively little demand for trade and transportation services as a final consumer good. Hence, the amount of trade and transport services for the marketing of commodities can be derived as a residual: total domestic production of trade and transport services plus imports and tariffs minus intermediate demand, final demand and exports. They are divided into import, domestic and export margins according to the share of imports, exports and domestic production in total absorption. The marketing margins for imports (CMMI), domestic production (CMMD), and exports (CMME) by commodity are then generated according to the respective commodity's share in total domestic supply, total imports, and total exports.[10]

6. Other indirect taxes [government, commodities]: Other indirect taxes are separated into domestic indirect taxes on commodities and trade taxes. Domestic indirect taxes are mainly excise taxes.

Again, as in the case of value-added taxes, recent information on the structure of tax payments by sectors does not exist in Zambia. Only the *31-Sector Oxford Input-Output Table* provides an analysis of the sectoral indirect tax structure for Zambia in 1985. Indirect taxes for non-agricultural sectors (including fisheries and forestry) have to be calculated from sectoral excise tax shares as derived from the *31-Sector 1985 Oxford*

[9] This is truly a simplifying assumption not accounting for the production of more than one commodity by a single activity (e.g., manure or skins as by-products of livestock (meat) production).

[10] The result is purely synthetic and can be viewed as a prior for the SAM balancing procedure only.

Input-Output Table.[11] They are applied to the total of excise taxes in the 1995 National Accounts (see macro SAM, Section 6). Sector-specific indirect taxes on crop and livestock commodities are generated according to their share in total supply of agricultural commodities.[12]

Tariffs are extracted from a World Bank database on imports and tariffs in Zambia in 1995. The construction of sectoral effective tariff payments equals the derivation of sectoral import values (see micro SAM, Section 7).

7. Imports of goods and services [ROW, commodities]: Imports in the *1995 National Accounts* are defined to include merchandise, transport and communication services, insurance services and miscellaneous goods and services (ROZ, 1997c and 1997d). They are valued in c.i.f. border prices.

Data on imports of services is estimated from balance of payments statistics supplied by the International Monetary Fund (IMF, 1997a).[13] It is assumed that 79 percent of total imports in the *1995 National Accounts* data are merchandise imports, and 21 percent are imports of services. Of the latter, 35 percent are classified as imports of transport services, and 65 percent are classified as imports of business services.

Shares for imports of merchandise are extracted from a World Bank database on imports and tariffs in Zambia in 1995.[14] Imports of merchandise are recorded in an eight digit HS code format and amount to 6537 line items. The sectors of the ZAMSAM are somewhat close to a two or three digit ISIC industry classification, with fewer details in non-agricultural and more in agricultural sectors. The mapping from HS classification to the ZAMSAM sectors is developed on the basis of a concordance between six digit HS sectors and GTAP sectors. The latter can be mapped to the ZAMSAM sectors rather easily.[15] The derived shares are applied to the value of total imports in the *1995 National Accounts* data net of service imports.

8. Labor income [households, factors]: Labor value-added is distributed to households according to the shares derived from the *1996 Living Conditions Monitoring*

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[11] This approach assumes that the structure of taxes paid by various sectors in the economy stays constant over time.

[12] In general, it is somewhat unclear if there are indirect taxes paid on marketed agricultural commodities. For this version of the micro SAM it was assumed that there are.

[13] The difference between the definition of exports and imports in balance of payments statistics, which are valued f.o.b. and compromise all transactions involving a change in ownership, and the definition in the national accounts data is neglected.

[14] The database is discussed in Tokeshi (1997). Despite the detail of the data set, it is obvious that the general insufficiencies of trade data in developing countries cannot be overcome. Smuggled goods, illegal transit sales, cross-border sales of crops and cattle, or military imports are hardly ever accounted for.

[15] For concordances between HS, SITC, ISIC, and GTAP sectors see the following WWW sites: http://www.agecon.purdue.edu/gtap/ and http://intrepid.mgmt.purdue.edu/jon/data/tradeconcordances.html.

Survey. The raw data is taken from a table listing the distribution of the population aged 12 years and above not currently attending school by the highest level of education attained and stratum. The educational levels are the same as in the *1993 Priority Survey*. The stratum is divided into four rural households (small-scale farmers, medium-scale farmers, large-scale farmers, and non-agricultural households) and into three urban households (high, medium, and low cost areas). By re-grouping small- and medium-scale farm households, large-scale farm households and non-agricultural rural households, low and medium cost urban households, and large high costs into the four ZAMSAM households (HHNR, HHNU, HHML, and HHMH), it is possible to derive column coefficients which allocate total labor income per labor category to households. The resulting initial distribution of labor payments to households is shown in Table 5.

Table 5: Distribution of labor value added - Shares per labor group (%)

	LNONE	LPRIM	LSECO	LPOST
HHMH	0.5	1.3	6.6	23.0
HHML	13.7	26.9	57.5	52.3
HHNU	6.0	5.7	4.1	2.7
HHMR	79.8	66.1	31.8	22.0
	100.0	100.0	100.0	100.0

Source: Adopted from ROZ (1998a).

9. Capital income [enterprises, factors]: As in the macro SAM (see macro SAM, Section 9) the sum over all payments to value-added capital is paid as income to the enterprise account. Enterprises distribute this capital income to households, the government (corporate taxes), the rest-of-the-world (transfers), and savings.

10. Own-household consumption [activities, households]: Own-household consumption is defined as the consumption of goods that are produced and consumed by a household without entering the domestic market. These goods are assumed to be valued in producer prices, without any addition of trade or transport margins. In terms of the SAM, they are directly consumed out of activity accounts, thus reducing marketed supply of domestic production (see micro SAM, Section 4). Incorporation of own-household consumption into the SAM captures agricultural subsistence demand and the effects of policy changes on effective consumption and income.

Values for own-household consumption are taken from the *1993/94 Household Budget Survey*. It lists monthly household values of own-produce consumed at January 1994 prices distinguished by metropolitan and non-metropolitan, and by urban and rural households. Shares are given for several subgroups. They are aggregated to the ZAMSAM sectors and applied to the estimated total own produce consumption value of each ZAMSAM household in 1995. The latter are derived by multiplying the monthly

values for total own-produce consumption per household in 1994 by the number of households in the specific household group and the consumer price index for 1994 (IMF, 1997a), and summing them up to yearly values.

11. Final household consumption [commodities, households]: Values for private cash consumption are extracted from consumer price index weights of the *1993/94 Household Budget Survey*. This survey distinguishes high- and low-income metropolitan households from non-metropolitan households. In order to derive cash consumption values for the four household types of the ZAMSAM, it is assumed that the consumption structure for metropolitan low-income and non-metropolitan urban households is identical. Furthermore, a concordance between the 616 items that are part of the consumer price index and the classification of the ZAMSAM sectors is derived. The resulting aggregated shares are then applied to yearly cash-consumption values for the four households. The consumption values are further adjusted such that the sum over all commodities and households equals the control total for total final household consumption in the macro SAM (see macro SAM, Section 11).

12. Individual income tax [government, households]: In the micro SAM, it is assumed that only metropolitan high-income households pay individual income taxes. The macro SAM figure for individual income tax is therefore allocated to the HHMH. It amounts to ZK' Mill 134,153.

13. Individual factor income to ROW [ROW, households]: Again, it is assumed that only metropolitan high-income households pay individual factor income to the rest-of-the-world. Due to the SAM balancing procedure, the adjusted micro SAM figure is ZK' Mill 17,668 (a 1.54 percent increase compared to the figure in the micro SAM).

14. Household savings [savings, household]: Due to the lack of detailed data on household savings, shares for three household groups, HHML, HHNU, HHNR are assumed to be at 5, 2, and 1 percent, respectively. The savings rate for the fourth household, HHMH, is computed as a residual such that the sum over savings of all households equals the value for total household savings in the macro SAM.

15. Retained earnings [household, enterprises]: Retained earnings from enterprises and transfers and pensions from the government (micro SAM, Section 20) are distributed to households according to their specific income-expenditure deficits. These deficits occur after taking account of all household expenditures and incomes, except income received from enterprises for the provision of capital factors and transfers and pensions from the government. Total retained earnings are calculated as a residual of total enterprise receipts minus corporate tax payments, transfers abroad and savings.

Value-added income on land does not pass through the enterprise account but is allocated as factor income from land to rural non-metropolitan households, exclusively.

16. Corporate taxes [government, enterprises]: The micro SAM – as the macro SAM – contains only one representative enterprise account. Hence, corporate taxes in the micro SAM equal those in the macro SAM (ZK' Mill 56,309).

17. Enterprise (factor) payments to ROW [ROW, enterprises]: As with corporate taxes, the enterprise payments to the rest-of-the-world should equal those in the macro SAM. They change from their original level of ZK' Mill 237,723 to ZK' Mill 235,434 (minus 0.96 percent) after applying the balancing procedure.

18. Enterprise savings [savings, enterprises]: Again, since the micro SAM contains only one enterprise account, the figure for enterprise savings in the micro SAM should in principle equal the macro SAM entry. After applying the entropy balancing procedure, enterprise savings in the micro SAM amount to ZK' Mill 47,560 (a 1.98 percent change from the macro SAM figure).

19. Government final consumption [commodities, government]: In both the macro and the micro SAM, a single column vector represents government expenditure. It is assumed that the government produces its own services, *public non-market services* (*CPUB*), under the *public non-market service* activity. It then demands most of its services as final government consumption and provides them to the public. There is no government final demand for other goods and services and little intermediate and private demand for *public non-market services*.[16] The figure for government final consumption of *public non-market services* in the micro SAM equals that in the macro SAM (ZK' Mill 464,094).

20. Government transfers and pensions [households, government]: Government transfers and pensions, together with retained earnings from enterprises, are distributed to households according to their specific income-expenditure deficits (see micro SAM, Section 15).

21. Government savings [savings, government]: In principle, the figure for government savings in the micro SAM should equal that in the macro SAM. After applying the SAM balancing procedure, the government deficit amounts to ZK' Mill -21,890 (a 1.93 percent change from the original macro SAM entry).

22. Exports of goods and services [commodities, ROW]: Exports in the *1995 National Accounts* are defined to include merchandise, transport and communication services, insurance services and miscellaneous goods and services (ROZ, 1997c and 1997d). They are valued in f.o.b. border prices.

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[16] This approach assumes that, for example, government demand for "bombs and missiles" is accounted for as intermediate consumption and delivered to the public as the public good "national security" in the form of final government demand for *public non-market services*. Of course, this example is purely theoretical without any empirical content applicable to Zambia.

Values for merchandise exports are derived from an eight digit HS sector classification with 743 lines of exports. The Central Statistics Office in Lusaka provided this unofficial data set. Merchandise exports are mapped to the ZAMSAM sector classification by use of the same concordance developed for the mapping of imports (see micro SAM, Section 7). Service exports are assumed to stem from two sectors, tourism and financial, insurance and business services. Since detailed data on service exports is missing, these values are mainly constructed as balancing items and netted out of total exports.

23. Foreign savings [savings, ROW]: Net capital inflows from the rest-of-the-world (foreign savings) amount to ZK' Mill 398,996 after balancing the SAM. This is a 0.5 percent reduction compared to the original macro SAM figure.

24. Investments [commodities, investments]: The structure of investment demand is taken from the 1995 Oxford Financial SAM (Adam and Bevan, 1996).[17] For our purposes, it is assumed that investment goods are demanded exclusively from the capital goods and construction sector.[18] The resulting shares for these two goods in total investment demand net of agricultural investment goods are then applied to the sum of GFCF and the change in stocks from the 1995 National Accounts (see macro SAM, Section 24). It is subsequently adjusted for balancing purposes.[19]

3.4 Balancing the SAM using a cross-entropy approach

This section briefly describes the balancing procedure and some prior adjustments made to the proto SAM. It also compares the original macro SAM, which drives the construction and balancing procedure of the proto SAM, with the "adjusted" macro SAM that can be derived from the 1995 ZAMSAM.

The process described in the previous section leads to a complete, but unbalanced micro SAM for Zambia in 1995 ("proto SAM"). Next, a cross-entropy approach is applied in order to balance the SAM.[20] It minimizes the entropy distances between prior

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[17] In the financial SAM, investment commodities are demanded from commercial agriculture, capital goods and construction. Their share in total investment demand is 5, 79, and 16 percent, respectively (Adam and Bevan, 1996).

[18] Since there is absolutely no information on the composition of agricultural goods demanded for investment purposes, its allocation to specific crops or livestock would be completely arbitrary. It is therefore distributed to construction and capital goods.

[19] Note that investment has been defined in terms of the commodities used in the production of the capital stock. This implies that any modeling period is so short that investments cannot provide additional production capacity.

[20] See Kapur and Kesavan (1992), Golan, Judge, and Miller (1996) for an introduction of the cross-entropy approach. See Golan, Judge, and Robinson (1994), Robinson, Cattaneo, and El-Said (1998) and Channing, Robinson and Tarp (1999) for applications within the context of SAM and CGE estimation.

coefficients from the proto SAM and the new micro SAM. The new SAM must satisfy the condition that all corresponding row and column totals balance. Furthermore, all column coefficients must be smaller than one and they must add up to one by column. Other constraints can be imposed, which impose knowledge about certain parts of the SAM. In the Zambian case, various macro SAM entries are imposed as constraints. They insure that the balanced micro SAM largely reflects the structure of the 1995 National Accounts.

Unfortunately, as the proto SAM is highly unbalanced, the number of constraints that can be imposed without preventing the solver of the cross-entropy procedure from finding an optimal (or even a feasible) solution is limited. In addition, the distribution of the deviations in row and column totals over all coefficients is purely driven by the entropy distance minimization. With huge deviations, it often leads to SAM entries that are out of line with prior knowledge or economic reasoning. To cope with these problems, several prior adjustments are made to the proto SAM. They include the following:[21]

(1) Where domestic production of agricultural goods is too small to even satisfy own-household consumption (leading to negative marketed supplies), VA labor is adjusted upwards assuming that the consumption of own produce is not adequately captured in VA agriculture in the national accounts.

(2) In some sectors with higher than likely capital intensities, VA capital is reduced and VA labor increased correspondingly.

(3) Intermediate demand in public services is increased in order to match the level of final government demand in the national accounts.

(4) Intermediate demand for commodities from agricultural sectors, wood and furniture, and electricity and water, and final household demand for maize, tourism and finance services are altered. These changes mainly reflect balancing needs.

(5) The level of consumption is altered for three households (it increases for HHML and decreases for HHMH and HHNR), in order to achieve a balance between household expenditure and income.

(6) Some exports are adjusted. Especially for tourism and finances this creates export opportunities that are not reflected in official trade data but have high potential in Zambia.

[21] Details on these adjustments are available from the author in the form of a file written in GAMS code.

After these adjustments the adjusted proto SAM is balanced through the cross-entropy balancing procedure.[22] Constraints that are imposed as control totals from the macro SAM are:

- total value-added,
- total indirect taxes on activities and commodities, as well as total tariffs,
- total imports and total exports,
- total household consumption (the sum of total own-produce consumption and total cash consumption),
- total direct taxes from households and from enterprises,
- total government consumption, and
- total investment demand.

Table A1 in the Appendix shows the macroeconomic social accounting matrix that results from an aggregation of the appropriate entries of the balanced micro SAM. It also lists the percentage differences from the original macro SAM entries. They capture the changes in the macroeconomic structure that are due to the balancing process. Cell entries with zero changes correspond to constraints on national account balances. The totals with the largest changes are the totals for own-household consumption (minus 13 percent) and cash consumption (plus 4 percent), which are constrained only as a sum, since only a control total for the latter is provided by the national accounts. Similarly, due to data insufficiencies, the total value for trade and transportation services included in the marketing of goods, and the total savings of households, enterprises and the government are unconstrained. They increase by 4, 3, 2, and 3 percent, respectively. All other entries are either fixed or subject to very small changes. This is not surprising given the amount of prior adjustments imposed on the initial proto SAM. Table A8 in the Appendix shows the complete 1995 SAM for Zambia.

3.5 The structure of the Zambian economy: A SAM perspective

The structure of the Zambia economy in the 1995 ZAMSAM is presented in Tables 6 to 10. Table 6 lists the composition of GDP f.c., output, value-added labor, capital and land. While agriculture contributes about 22 percent to GDP, non-agricultural sectors contribute 78 percent. Relatively large contributions to agricultural GDP originate from maize, horticulture, other crops and forestry. Zambia's mining sector, while contributing about 78 percent of total exports, accounts only for 17 percent of value-added production.

[22] The code for the cross-entropy procedure including the various constraints that are imposed is available from the author in the form of a file written in GAMS code.

Services are dominated by trade and transportation services. With 20 percent of total GDP production, it is almost as large as all agricultural activities combined. To a large extent this share reflects the importance of the informal sector, which is largely captured within agricultural and trade and transport activities (ROZ, 1997c and 1997d).

Table 9 reflects the composition of exports and imports in the ZAMSAM as well as the share of exports in total production and the share of imports in total absorption. In 1995, Zambia's exports are still dominated by copper and cobalt exports. The mining sector contributes 77 percent of total exports and exports almost all of its production. Relatively low contributions to total exports are recorded for agricultural commodities, with larger shares of exports in domestic sectoral production for tobacco and coffee. This might be due to the problem of recording agriculture trade flows from and to neighboring countries (see Section 3.3), which often do not pass through official trade records. Exports of roses, fruits and vegetables, which have recently become indicative of increases in non-traditional exports, are somewhat hidden within the production of horticulture for domestic use. Tourism and financial services contribute to total production, but the magnitude of their share can be attributed mostly to the SAM construction process (it is determined as a residual, see Section 3.3). Nevertheless, both sectors have high potential for export growth. Another important feature of the Zambian economy is its dependence on imports for domestic absorption. This includes imports for intermediate use and final consumption. The highest import ratios are recorded for capital goods, fertilizer and other manufacturing. The high import ratios for maize and cotton reflect the effects of a major drought and the use of cotton as an imported intermediate input in textile and garments.

Table 8 provides further details on the sectoral composition of value-added and the value-added intermediate input ratio. It therefore characterizes the production technology reflected in the ZAMSAM. By assumption, most agricultural activities use labor only from the two labor categories LNONE and LPRIM. This is somewhat consistent with results from the 1996 LCMS, which list the highest level of education attained by 85 percent of the small-scale farm households and 75 percent of the medium scale farm households at grade 5 to 7. Services, especially tourism, other market (personal) services, and public services, employ relatively more labor with higher academic qualifications. Trade and transportation services contribute VA relatively evenly over the three lower skilled labor categories. This is largely due to the high share of informal activities incorporated in these services. The shares for labor, land and capital VA in crop activities are in line with shares for aggregated agriculture reported by other studies.[23] Manufacturing sectors are relatively capital intensive, with the highest shares in mining, other manufacturing, and electricity and water. Ratios of total value-added to total

[23] The Global Trade Analysis Project (GTAP) of the Center for Global Trade Analysis, Purdue University, indicates a 15:60:25 split for aggregate agriculture between value-added land, labor, and capital in Sub-Saharan African countries (Republic of South Africa and Republic of Zimbabwe).

intermediate inputs are reported in the last two columns of Table 8. The relatively high shares of intermediate input use in food, beverages and tobacco, textile and garments, and - to a lesser extent - wood and furniture indicate the potential for domestic agriculture to substitute imported intermediate inputs.

Tables 9 to 11 characterize total consumption, income and savings for the four household types in the ZAMSAM. Due to missing data and data inconsistencies, household savings are for the most part driven by initial assumptions and final balancing adjustments. The monthly values for total household consumption are distributed over households according to expectations based on their socio-economic group. Nevertheless, they are substantially lower than mean monthly incomes reported for Zambia in 1996 (ROZ, 1998a). The latter range from ZK 57,023 for subsistence farmers, ZK 147,541 for formal private employees, ZK 167,606 for government employees, up to ZK 791,708 for employers.

4. Conclusions

This paper has documented the construction of the 1995 Social Accounting Matrix for Zambia. The data has been gathered from a number of sources of varying quality and years, making their reconciliation a challenging task. The rather dated input-output structure was one particular obstacle, which was partially overcome in agriculture by deriving input coefficients from a more recent set of farm budgets. Other discrepancies and gaps were resolved with adjustments made on the basis of knowledge from other countries or economic reasoning.

The overall structure of the SAM succeeds in reflecting the economic structure of the Zambian economy in the base year. This results from the entropy balancing procedure, which imposes macroeconomic control totals from national accounts on various sub-matrices of the SAM. Thus, the SAM is suitable for purposes of modeling the general equilibrium effects of macroeconomic reforms in Zambia. Nevertheless, the need for updated and consistent data cannot be ignored in the SAM, nor in any experiments for which it is used.

Table 6: The structure of the Zambian economy based on the 1995 ZAMSAM - Composition of GDP f.c., production, VA labor, capital, and land

	Composition (%)				
	GDP f.c.	**Production**	**Labor**	**Capital**	**Land**
ASMA	3.4	2.3	5.2	0.6	37.7
ALMA	0.7	0.7	0.6	0.6	6.1
ASTA	1.0	0.5	1.3	0.1	18.2
AGNT	0.4	0.3	0.5	0.1	5.9
ASUG	0.3	0.2	0.2	0.3	1.9
ACOT	0.5	0.3	0.6	0.2	3.9
ATOB	0.3	0.2	0.3	0.1	2.0
ACOF	0.3	0.2	0.3	0.1	6.5
AWHE	0.6	0.4	0.6	0.3	9.1
AHCR	5.0	2.8	9.4	0.7	3.1
AOCR	3.2	1.7	6.2	0.1	5.8
ALIV	1.8	1.9	2.5	1.1	-
AFIS	0.9	2.3	0.8	1.1	-
AFOY	3.7	2.2	4.4	3.4	-
AMIN	17.3	12.2	4.7	31.3	-
AFBT	6.1	11.3	7.3	5.3	-
ATAG	1.4	2.9	0.9	1.6	-
AWAF	2.2	2.0	1.6	2.9	-
AFER	0.4	0.2	0.3	0.5	-
AOMA	2.1	3.9	0.3	2.5	-
AEAW	4.6	3.5	0.7	9.2	-
ACAG	2.1	1.7	1.5	1.3	-
ACON	1.7	6.1	1.5	1.9	-
ATSV	20.3	20.7	23.5	18.3	-
ATOU	1.1	0.6	1.6	0.7	-
ASER	3.6	2.4	6.0	1.3	-
AFIN	7.9	7.8	5.8	11.0	-
APUB	7.0	8.8	11.1	3.5	-
TOTAGR	22.0	15.9	33.1	8.9	100.0
TOTNAGR	78.0	84.1	66.9	91.1	

Source: Adopted from the 1995 ZAMSAM.

Table 7: The structure of the Zambian economy based on the 1995 ZamSAM - Composition of exports and imports, sectoral export and import ratios

	Composition (%)		Ratios (%)	
	EXP	**IMP**	**EXPS**	**IMPS**
CMAI	0.7	2.4	10.0	35.3
CSTA	0.0	0.0	0.2	0.1
CGNT	0.0	0.0	2.3	1.0
CSUG	-	-	-	-
CCOT	0.1	0.7	6.8	35.0
CTOB	0.4	0.1	34.4	17.4
CCOF	0.3	0.0	29.8	0.2
CWHE	0.0	0.6	0.2	26.4
CHCR	0.5	0.4	5.2	6.8
COCR	0.3	0.4	5.5	10.2
CLIV	0.1	0.1	1.1	1.2
CFIS	0.0	0.0	0.0	0.1
CFOY	0.0	0.0	0.3	0.2
CMIN	77.3	1.4	96.9	26.0
CFBT	1.7	4.2	2.8	8.8
CTAG	1.9	2.6	9.9	18.2
CWAF	0.2	5.8	1.5	38.5
CFER	0.1	4.6	7.1	74.2
COMA	2.7	20.2	10.4	51.8
CEAW	6.4	0.0	27.7	0.3
CCAG	1.1	38.7	9.6	80.4
CCON	-	-	-	-
CTSV	-	6.1	-	7.7
CTOU	3.6	-	87.8	-
CSER	-	-	-	-
CFIN	2.5	11.7	4.9	30.8
CPUB	-	-	-	-

Note: EXP - exports
IMP - imports
EXPS - share of exports in total production
IMPS - share of imports in total production

Source: Adopted from the 1995 ZAMSAM.

Table 8: The sectoral structure of the Zambian economy based on the 1995 ZAMSAM - Factor payments, value added and intermediate input shares

	(%)							
	Labor						Total	
	LNONE	LPRIM	LSECO	LPOST	LAND	CAP	VA	INPUT
ASMA	10.4	64.4	-	-	17.6	7.6	71.5	28.5
ALMA	22.7	21.0	-	-	14.1	42.3	48.5	51.5
ASTA	22.6	44.0	-	-	29.5	3.8	88.6	11.4
AGNT	31.0	34.9	-	-	23.4	10.7	66.8	33.2
ASUG	16.8	16.3	-	-	10.9	56.1	62.1	37.9
ACOT	43.9	19.9	-	-	13.3	22.9	74.4	25.6
ATOB	45.9	17.5	-	-	11.7	24.9	70.0	30.0
ACOF	4.9	51.9	-	-	34.7	8.5	90.3	9.7
AWHE	11.1	38.4	-	-	25.7	24.9	75.3	24.7
AHCR	3.0	89.6	-	-	1.0	6.4	84.3	15.7
AOCR	0.9	89.5	5.1	-	2.9	1.6	90.4	9.6
ALIV	5.3	-	66.3	-	-	28.4	45.6	54.4
AFIS	12.3	27.2	5.7		-	54.8	19.5	80.5
AFOY	0.8	55.0	2.5	0.1	-	41.7	79.4	20.6
AMIN	0.4	2.3	9.3	1.9	-	86.1	67.5	32.5
AFBT	18.5	35.3	4.3	1.2	-	40.6	25.9	74.1
ATAG	0.3	11.7	24.6	2.2	-	61.3	23.8	76.2
AWAF	8.5	8.6	17.2	2.7	-	63.1	52.8	47.2
AFER	0.7	14.3	22.3	4.9	-	57.7	79.8	20.2
AOMA	0.8	2.3	5.7	3.0	-	88.2	25.5	74.5
AEAW	0.0	1.5	4.7	1.8	-	91.9	62.6	37.4
ACAG	0.9	13.4	34.1	7.6	-	44.1	57.7	42.3
ACON	2.5	16.8	23.1	2.9	-	54.7	13.5	86.5
ATSV	11.8	24.7	18.9	2.6	-	42.1	46.5	53.5
ATOU	3.2	25.5	36.9	6.5	-	28.0	87.5	12.5
ASER	3.3	12.2	57.5	10.1	-	16.8	72.8	27.2
AFIN	4.9	17.3	12.0	2.2	-	63.6	48.3	51.7
APUB	2.7	11.0	43.3	20.2	-	22.9	38.2	61.8

Note: LNONE - "unskilled" labor
LPRIM - labor with "primary education"
LSECO - labor with "secondary education"
LPOST - labor with "post secondary education" and "degree"
CAP - capital
VA - total value-added
INPUT - total intermediate inputs

Source: Adopted from the 1995 ZAMSAM.

Table 9: Total household consumption based on the 1995 ZAMSAM

	HHMH	HHML	HHNU	HHNR
Value (in ZK'mill)	463,890	670,887	156,483	1,116,062
Share in total (%)	19.3	27.9	6.5	46.3
No. of HHs	145,000	1,548,000	249,000	2,768,000
Mon. Value (ZK)	266,604	36,116	52,371	33,600

Source: Adopted from the 1995 ZAMSAM.

Table 10: Household savings based on the 1995 ZAMSAM

	HHMH	HHML	HHNU	HHNR
Rate (in %)	2.19	4.85	1.16	0.78
Yearly Value (ZK)	70,016	21,060	7,260	3,140
Share (in %)	19.1	61.2	3.4	16.3

Source: Adopted from the 1995 ZAMSAM.

Table 11: Composition of household income based on the 1995 ZAMSAM (in ZK' Mill)

	LNONE	LPRIM	LSECO	LPOST	LAND	ENTR	GOVR
HHMH	2,197.9	23,849.4	69,648.7	38,506.7		316,568.9	13,118.8
HHML	22,178.5	164,594.2	198,965.7	29,404.8		194,194.4	61,549.1
HHNU	10,220.2	37,955.6	16,985.6	2,040.4		86,032.1	3,249.3
HHNR	135,961.0	437,336.7	133,225.6	20,261.7	43,705.5	316,077.8	29,494.1
Total	170,557.6	663,735.9	418,825.5	90,213.5	43,705.5	912,873.3	107,411.4

Source: Adopted from the 1995 ZAMSAM.

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APPENDIX

Table A1: Zambia - Adjusted macroeconomic social accounting matrix for 1995 and percentage deviations from the original macro SAM (in ZK' Mill)

	Activities	Commodities	Factors	Households	Enterprises	Government	ROW	Capital Account	Total
Activities		5,320,853 (5,295,111) +0.49%		455,023 (521,601) -12.76%					**5,775,876** **(5,816,712)** **-0.70%**
Commodities	3,027,876 (3,068,712) -1.33%	1,002,970 (965,489) +3.74%		1,747,227 (1,680,649) +3.96%		464,049	1,082,341	477,917	**7,802,380** **(7,739,157)** **-0.82%**
Factors	2,639,214								**2,639,214**
Households			1,387,038		912,873 (911509) +0.15%	107,411 (106,997) +0.39%			**2,405,544** **(2,407,323)** **+0.07%**
Enterprises			1,252,176						**1,252,176**
Government	108,786	250,322		134,153	56,309				**549,570**
ROW		1,228,235		17,668 (17,400) +1.54%	235,434 (237,723) -0.96				**1,481,337** **(1,483,358)** **-0.14%**
Capital				53,252 (51,741) +2.92%	47,560 (46,635) +1.98	-21,890 (-21,476) +1.93%	398,996 (401,017) -0.50%		**477,917**
Total	**5,775,876** **(5,816,712)** **-0.70%**	**7,802,380** **(7,739,157)** **-0.82%**	**2,639,214**	**2,405,544** **(2,407,323)** **+0.07%**	**1,252,176**	**549,570**	**1,481,337** **(1,483,358)** **-0.14%**	**477,917**	

Note: Values in parenthesis are from original macro SAM (MacroSAM0).

Table A2: Definition of the ZAMSAM activities

SAM Sectors	SAM Code	SAM No.	Included Sectors
Agricultural Activities			
Maize			Maize
Maize, small and emergent	ASMA	1	Small and emergent production technology
Maize, commercial	ALMA	2	Commercial production technology
Drought-tolerant staples	ASTA	3	Cassava Millet Sorghum
Groundnuts	AGNT	4	Groundnuts
Sugar	ASUG	5	Sugar
Cotton	ACOT	6	Cotton
Tobacco	ATOB	7	Tobacco
Coffee	ACOF	8	Coffee
Wheat	AWHE	9	Wheat
Horticulture crops	AHCR	10	Flowers Vegetables Fruits (Others)
Other crops	AOCR	11	Soybeans Potatoes Rice Sunflowers (Others)
Livestock products	ALIV	12	Cattle Goats Pigs Poultry (Others)
Fisheries	AFIS	13	Fishing
Forestry	AFOY	14	Forestry
Non-agricultural SAM Sectors			
Metal mining	AMIN	15	Mineral ore mining Other minerals
Food, beverages, and tobacco	AFBT	16	Food manufacturing Animal feed manufacturing Beverage manufacturing Tobacco manufacturing
Textiles and garments	ATAG	17	Textiles manufacturing Wearing apparel manufacturing Leather products (except shoes) Footwear
Wood, furniture, and paper	AWAF	18	Wood manufacturing (continued …)

(... continued)			Furniture and fixtures Paper products Printing and stationary
Fertilizer, pesticides, basic chem.	AFER	19	Industrial chemicals (2)
Other manufactures	AOMA	20	Other chemical products Manufacture of petroleum products (1) Manufacture of coal products Manufacture of rubber products Manufacture of plastic products Manufacture of glass products Manufacture of lime and cement Manufacture of basic metal products Manufacture of non-ferrous metal products
Energy	AEAW	21	Electricity generation Water supply Gas
Capital goods	ACAG	22	Manufacturing of industrial engines and parts Manufacturing of electrical machines Manufacturing of transport equipment
Construction	ACON	23	Construction
Trade and transportation services	ATSV	24	Wholesale trade Retail trade Rail transport Road transport Other transport (including transport services) Post and telecommunications
Tourism	ATOU	25	Bars and restaurants Hotels and lodging
Other market services	ASER	26	Private community, social and personal services
Finance	AFIN	27	Financial institutions Insurance services Real estate Business services
Public non-market services	APUB	28	Public administration Education Health Recreation and cultural services
Note: (1) "Oil" and "fuel" is included into "Other manufactures".			

Source: Data from various MAFF, MoF, CSO, and World Bank (John C. Keyser) data sources.

Table A3: Farm budgets used in the construction of the ZAMSAM agricultural input coefficients

Crop	Small Emergent Commercial	Location	In Prices of Year
Coffee			
Coffee	Commercial	Mazabuka	1995
Cotton			
Cotton	Small-scale	Mumbwa	1995
Cotton	Emergent	Mumbwa	1995
Cotton	Commercial	Mazabuka	1995
Drought-tolerant Staples			
Cassava (1)	Small-scale	Lusaka	n.a.
Finger millet	Small-scale	Kasama	1995
Finger millet	Emergent	Kasama	1995
White sorghum	Small-scale	Choma	1995
White sorghum	Small-scale	Solwezi	1995
White sorghum	Emergent	Choma	1995
White sorghum	Emergent	Solwezi	1995
Red sorghum	Commercial	Mazabuka	1995
Groundnuts			
Groundnuts	Small-scale	Chipata	1995
Groundnuts	Emergent	Chipata	1995
Horticulture			
Onion	Small-scale	Lusaka	1995
Onion	Small-scale	Mazabuka	1995
Onion	Emergent	Lusaka	1995
Onion	Emergent	Mazabuka	1995
Paprika	Commercial	Lusaka	1995
Sugar beans	Small-scale	Solwezi	1995
Sugar beans	Small-scale	Chipata	1995
Sugar beans	Emergent	Chipata	1995
Baby corn	Commercial	Lusaka	1995
Roses	Commercial	Lusaka	1995
Maize			
Maize	Small-scale	Mkushi	1995
Maize	Small-scale	Chipata	1995
Maize	Small-scale	Kasama	1995
Maize	Small-scale	Mazabuka	1995
Maize	Emergent	Mkushi	1995
Maize	Emergent	Chipata	1995
Maize	Emergent	Kasama	1995
Maize	Emergent	Mazabuka	1995
Maize	Commercial	Mkushi	1995
Maize	Commercial	Mazabuka	1995
Other Crops			
Irish potato	Small-scale	Mazabuka	1995
(continued …)			
(... continued)			

Irish potato	Small-scale	Mkushi	1995
Irish potato	Emergent	Mazabuka	1995
Irish potato	Emergent	Mkushi	1995
Irish potato	Commercial	Mazabuka	1995
Irish potato	Commercial	Mkushi	1995
Rice	Small-scale	Kasama	1995
Rice	Small-scale	Mongu	1995
Rice	Emergent	Kasama	1995
Rice	Emergent	Mongu	1995
Soybeans	Small-scale	Mkushi	1995
Soybeans	Small-scale	Chipata	1995
Soybeans	Small-scale	Mazabuka	1995
Soybeans	Emergent	Mkushi	1995
Soybeans	Emergent	Chipata	1995
Soybeans	Emergent	Mazabuka	1995
Soybeans	Commercial	Mkushi	1995
Soybeans	Commercial	Mazabuka	1995
Soybeans, irrigated	Commercial	Mkushi	1995
Soybeans, irrigated	Commercial	Mazabuka	1995
Sunflower	Small-scale	Choma	1995
Sunflower	Small-scale	Katete	1995
Sunflower	Emergent	Choma	1995
Sunflower	Emergent	Katete	1995
Sugar			
Sugar cane (outgrowers)	Commercial	Mazabuka	1995
Wheat			
Wheat	Commercial	Lusaka	1995
Livestock			
Poultry (broilers)	Commercial	Lusaka	1995
Poultry (broilers)	Emergent	Lusaka	1995
Dairy	Commercial	Mazabuka	1995
Dairy	Commercial	Mazabuka	1995
Beef (feedlot I)	Commercial	Mazabuka	1995
Beef (feedlot II)	Commercial	Chisamba	1997
Beef (range-fed)	Small-scale	Agoye Area	1997
Beef (range-fed)	Emergent	Magoye Area	1997
Beef (range-fed)	Commercial	Mazabuka	1997
Pigs (2)	Commercial	n.a.	1995
Pigs (mixed own feed)	Commercial	Lusaka	1997

Notes:
(1) Cassava budget from MAFF data.
(2) Pig budget from ZNFU, not completely consistent with other budgets.

Source: Keyser, J.C. (1996).

Table A4: Formal employment by sector and academic qualification in Zambia in 1993

	None	Primary	Junior Secondary	Senior Secondary	Diplomas Certificates	Degrees
AAGR	7,828	28,345	7,542	8,752	2,249	186
AFIS	434	460	66	84	0	0
AFOY	111	1786	1,094	984	144	0
AMIN	1,581	12,187	10,093	26,196	3,252	728
AQUA	55	1,830	814	3,295	397	202
AFBT	414	5,253	3,100	5,308	759	101
ATAG	101	3,999	1,259	3,364	211	101
AWAF	295	3,213	1,607	3,631	354	94
AFER	204	1,993	995	2,284	224	0
AOMA	452	1,166	672	1,262	718	82
AEAW	155	2,611	1,419	5,272	533	278
ACAG	292	4,182	1,660	5,161	536	202
ACON	2,201	9,164	3,383	5,582	661	131
ATSV	2,025	13,837	6,066	15,966	2,278	219
ATRA	589	11,845	5,838	16,756	1,826	317
ATOU	506	3,459	1,517	3,992	570	80
ASER						
AFIN	1,712	5,661	2,746	19,510	3,137	809
APUB	4,696	31,459	16,905	69,227	23,078	3,306

Source: Compiled by CSO, Lusaka, based on PS II (ROZ, 1994).

Table A5: Informal employment by sector and academic qualification in Zambia in 1993

	None	Primary	Junior Secondary	Senior Secondary	Diplomas Certificates	Degrees
AAGR	366,412	1,052,125	92,162	57,412	1,636	179
AFIS	3,690	16,671	1,182	1,572	0	0
AFOY	1,530	3,521	694	531	0	0
AMIN	1,634	2,698	224	157	0	0
AQUA	476	361	0	34	0	0
AFBT	1,257	5,709	951	871	0	0
ATAG	387	3,236	1,321	1,017	195	0
AWAF	658	6,874	2,464	1,484	98	0
AFER	0	34	34	0	0	0
AOMA	98	565	444	98	0	0
AEAW	0	384	58	106	0	34
ACAG	839	3,621	963	1,835	98	106
ACON	262	3,294	409	690	34	0
ATSV	13,187	75,581	21,723	22,657	1,072	0
ATRA	1,326	6,280	1,437	2,818	141	34
ATOU	993	5,689	1,635	1,705	81	0
ASER	1,092	3,925	812	633	44	0
AFIN	691	3,569	677	1,723	0	0
APUB	3,275	11,532	2,438	1,860	131	0

Source: Compiled by CSO, Lusaka, based on PS II (ROZ, 1994).

Table A6: Formal average earnings by sector and academic qualification in Zambia in 1993

	None	Primary	Junior Secondary	Senior Secondary	Diplomas Certificates	Degrees
AAGR	6,418	9,953	8,460	29,088	30,016	107,000
AFIS	6,661	3,124	11,000	22,649		
AFOY	8,000	11,855	47,119	16,958	26,292	
AMIN	20,447	33,548	39,136	47,272	50,144	116,040
AQUA	18,000	27,964	32,309	40,925	128,371	78,250
AFBT	86,267	14,331	35,833	24,159	74,804	78,000
AMIL	14,701	12,148	18,268	54,076	64,873	
ATAG	0	15,511	13,942	45,443	29,033	91,000
AWAF	19,173	12,527	40,921	40,221	98,932	150,000
AFER	10,979	22,445	12,296	24,874	69,032	
AOMA	5,735	16,122	18,599	27,383	43,063	44,000
AEAW	11,530	19,041	36,502	27,719	86,589	82,342
ACAG	14,579	19,565	28,502	45,063	47,161	26,750
ACON	14,133	19,230	49,762	30,209	45,799	83,344
ATSV	25,526	28,338	28,344	32,543	73,487	144,282
ATRA	14,594	23,549	37,788	40,163	67,123	264,982
ATOU						
ASER						
AFIN	25,719	26,672	21,643	42,930	39,298	41,454
APUB	27,653	20,990	29,179	34,901	36,958	126,073

Source: Compiled by CSO, Lusaka, based on PS II (ROZ, 1994).

Table A7: Informal average earnings by sector and academic qualification in Zambia in 1993

	None	Primary	Junior Secondary	Senior Secondary	Diplomas Certificates	Degrees
AAGR	4,675	5,189	7,743	14,118	14,732	2,000
AFIS	26,525	13,789	10,424	20,497		
AFOY	15,617	16,648	13,353	12,654		
AMIN	6,796	5,106	6,443	63,944		
AQUA	70,405	79,876		80,000		
AFBT	52,615	24,436	5,820	24,924		
AMIL	0	3,210	286,948	40,000		
ATAG	6,726	19,858	19,471	62,097	37,494	
AWAF	236,346	18,736	34,025	24,709	15,000	
AFER		0	0			
AOMA	60,000	12,358	33,391	13,000		
AEAW		27,378	8,000	35,000		200,000
ACAG	6,587	21,728	48,648	41,877	36,000	500,000
ACON	14,274	31,005	24,791	19,714	0	
ATSV	27,475	37,527	36,884	56,485	42,275	
ATRA	23,936	29,658	21,312	63,160	42,143	0
ATOU						
ASER						
AFIN	7,656	12,530	9,741	24,326		
APUB	13,253	15,704	28,141	31,993	52,359	

Source: Compiled by CSO, Lusaka, based on PS II (ROZ, 1994).

Table A8: The 1995 social accounting matrix for Zambia

		1	2	3	4	5	6	7	8	9	10
		ASMA	ALMA	ASTA	AGNT	ASUG	ACOT	ATOB	ACOF	AWHE	AHCR
1	ASMA										
2	ALMA										
3	ASTA										
4	AGNT										
5	ASUG										
6	ACOT										
7	ATOB										
8	ACOF										
9	AWHE										
10	AHCR										
11	AOCR										
12	ALIV										
13	AFIS										
14	AFOY										
15	AMIN										
16	AFBT										
17	ATAG										
18	AWAF										
19	AFER										
20	AOMA										
21	AEAW										
22	ACAG										
23	ACON										
24	ATSV										
25	ATOU										
26	ASER										
27	AFIN										
28	APUB										
29	CMAI	6,612.0	1,189.4								
30	CSTA			1,360.7							
31	CGNT				5,111.1						
32	CSUG					2,284.4					
33	CCOT						31.6				
34	CTOB							39.7			
35	CCOF										
36	CWHE									481.4	
37	CHCR										6,674.6
38	COCR										
39	CLIV										
40	CFIS										
41	CFOY										
42	CMIN										
43	CFBT										
44	CTAG	5,259.2	1,829.6	1,102.0	245.3		77.4	302.3		484.3	1,054.7
45	CWAF										
46	CFER	21,449.3	12,103.8	249.3	120.9	2,014.0	2,755.2	2,464.7	646.6	1,373.1	14,749.7
47	COMA						278.6		133.5	1,380.1	330.1
48	CEAW		4,052.3	34.4			1,062.9	176.8	86.4	1,167.9	2,099.1
49	CCAG										

Table A8 (continued): The 1995 social accounting matrix for Zambia

		1	2	3	4	5	6	7	8	9	10
		ASMA	ALMA	ASTA	AGNT	ASUG	ACOT	ATOB	ACOF	AWHE	AHCR
50	CCON										
51	CTSV	3,930.7	1,543.1	722.0	143.0		337.2	65.1	20.1	289.9	487.3
52	CTOU										
53	CSER					551.4					
54	CFIN							205.0			
55	CPUB										
56	CMME										
57	CMMI										
58	CMMD										
59	LNONE	9,681.3	4,260.0	6,078.2	3,406.8	1,294.4	5,659.3	3,396.1	402.1	1,714.4	4,134.9
60	LPRIM	60,145.9	3,943.2	11,845.5	3,846.1	1,257.2	2,563.1	1,297.8	4,228.8	5,914.8	121,504.8
61	LSECO										
62	LPOST										
63	KAP	7,134.4	7,946.8	1,028.6	1,181.9	4,335.4	2,958.3	1,844.4	689.7	3,834.9	8,672.9
64	LAND	16,467.2	2,648.2	7,938.9	2,572.0	840.4	1,714.5	867.2	2,823.9	3,958.0	1,333.9
65	HHMH										
66	HHML										
67	HHNU										
68	HHNR										
69	ENTR										
70	GOVR										
71	DIRTX										
72	VATAX		676.1		278.8	211.4	289.2	177.6	147.0	341.6	460.9
73	INDTX										
74	TARIFFS										
75	WORLD										
76	KACCOUN										
77	TOTAL	130,679.9	40,192.5	30,359.7	16,906.0	12,788.5	17,727.1	10,836.7	9,178.2	20,940.4	161,502.8

Table A8 (continued): The 1995 social accounting matrix for Zambia

		11	12	13	14	15	16	17	18	19	20
		AOCR	ALIV	AFIS	AFOY	AMIN	AFBT	ATAG	AWAF	AFER	AOMA
1	ASMA										
2	ALMA										
3	ASTA										
4	AGNT										
5	ASUG										
6	ACOT										
7	ATOB										
8	ACOF										
9	AWHE										
10	AHCR										
11	AOCR										
12	ALIV										
13	AFIS										
14	AFOY										
15	AMIN										
16	AFBT										
17	ATAG										
18	AWAF										
19	AFER										
20	AOMA										
21	AEAW										
22	ACAG										
23	ACON										
24	ATSV										
25	ATOU										
26	ASER										
27	AFIN										
28	APUB										
29	CMAI		317.3				24,855.8				
30	CSTA						36,068.9				
31	CGNT						15,098.3				141.4
32	CSUG						11,551.2				
33	CCOT						118.5	33,811.4			
34	CTOB						10,670.0		446.5		
35	CCOF						7,729.3				
36	CWHE						37,219.7				
37	CHCR						3,056.7				388.2
38	COCR						9,961.0				279.5
39	CLIV		12,869.2				54,665.0		7.0		324.0
40	CFIS						129,661.1				
41	CFOY				2,025.6	5,498.3			8,366.7		
42	CMIN					12,819.7	3,362.9			9.0	46,059.3
43	CFBT		37,830.7				42,504.0	14.3	178.5		290.0
44	CTAG	16.9				3,817.6	14,995.9	32,744.3	1,014.5		260.1
45	CWAF	425.5		5,485.0	21,565.3	9,280.5	15,015.8	21,936.5	30,072.6	57.1	23,514.1
46	CFER	8,213.4	172.6			10,286.7	220.4	866.0		600.3	8,699.2
47	COMA	133.9	1,460.5	24,725.0	1,030.9	65,278.8	11,787.8	3,409.7	6,461.3	154.7	41,025.6
48	CEAW	36.3	215.8		543.4	15,168.4	4,891.3	20,703.6	638.9	838.1	36,079.9
49	CCAG	197.0	4,828.3	40,483.7	609.4	79,798.2	8,326.6	4,273.0	1,164.6	95.8	3,995.0

Table A8 (continued): The 1995 social accounting matrix for Zambia

		11	12	13	14	15	16	17	18	19	20
		AOCR	ALIV	AFIS	AFOY	AMIN	AFBT	ATAG	AWAF	AFER	AOMA
50	CCON	117.4	64.7			6,971.3	2,472.3	399.2	972.9	8.4	247.5
51	CTSV	139.1	773.5	20,779.2	274.2	5,183.9	15,756.4	2,847.9	3,049.8	709.5	1,852.6
52	CTOU										34.4
53	CSER		625.5			3,601.1					
54	CFIN			13,388.4	512.9	11,009.7	20,868.8	6,002.1	2,332.6	441.0	4,060.0
55	CPUB				45.2	51.1	1,974.4		6.3		113.3
56	CMME										
57	CMMI										
58	CMMD										
59	LNONE	746.6	2,530.3	3,087.8	769.1	2,045.6	30,510.5	81.9	4,854.1	70.1	266.7
60	LPRIM	78,022.8		6,807.3	56,243.8	10,492.3	58,227.7	3,698.7	4,920.9	1,403.4	811.6
61	LSECO	4,416.9	31,650.1	1,428.7	2,552.0	42,342.5	7,111.1	7,792.8	9,853.0	2,185.8	1,988.1
62	LPOST				117.5	8,562.0	2,021.8	712.4	1,546.0	484.1	1,059.7
63	KAP	1,401.5	13,540.8	13,729.8	42,637.1	392,241.9	66,910.7	19,439.6	36,137.8	5,660.7	30,849.1
64	LAND	2,541.3									
65	HHMH										
66	HHML										
67	HHNU										
68	HHNR										
69	ENTR										
70	GOVR										
71	DIRTX										
72	VATAX	179.8	1,852.5	290.0	240.2	18,714.5	4,013.1	7,921.8	3,861.3	1,674.8	22,327.7
73	INDTX										
74	TARIFFS										
75	WORLD										
76	KACCOUN										
77	TOTAL	96,588.3	108,731.7	130,204.8	129,166.7	703,164.2	651,626.9	166,655.4	115,885.6	14,392.9	224,666.9

Table A8 (continued): The 1995 social accounting matrix for Zambia

		21	22	23	24	25	26	27	28	29	30
		AEAW	ACAG	ACON	ATSV	ATOU	ASER	AFIN	APUB	CMAI	CSTA
1	ASMA									21,963.9	
2	ALMA									40,192.5	
3	ASTA										30,359.7
4	AGNT										
5	ASUG										
6	ACOT										
7	ATOB										
8	ACOF										
9	AWHE										
10	AHCR										
11	AOCR										
12	ALIV										
13	AFIS										
14	AFOY										
15	AMIN										
16	AFBT										
17	ATAG										
18	AWAF										
19	AFER										
20	AOMA										
21	AEAW										
22	ACAG										
23	ACON										
24	ATSV										
25	ATOU										
26	ASER										
27	AFIN										
28	APUB										
29	CMAI										
30	CSTA										
31	CGNT								36.1		
32	CSUG										
33	CCOT										
34	CTOB										
35	CCOF										
36	CWHE										
37	CHCR								97.5		
38	COCR								70.2		
39	CLIV								28.5		
40	CFIS					300.7					
41	CFOY		143.7		3,131.5						
42	CMIN		400.0	23,836.1							
43	CFBT					2,875.6			16,341.4		
44	CTAG	63.4	270.8	7,105.9	20,929.3	72.3	381.8	17,367.9	4,734.4		
45	CWAF	172.6	116.8	14,635.6	24,894.2	99.7	8,388.7	4,031.3	24,406.4		
46	CFER	1,617.9	627.7	1,350.1	10,127.9						
47	COMA	29,189.2	3,298.0	108,700.7	144,353.9	193.8	5,432.8	7,563.6	27,489.3		
48	CEAW	1,668.6	215.2	6,428.6	6,758.1	83.9	8,897.4	2,665.7	12,038.7		
49	CCAG	24,183.1	32,644.9	63,427.8	45,080.1	183.9	4,370.4	6,178.1	29,638.3		

Table A8 (continued): The 1995 social accounting matrix for Zambia

		21	22	23	24	25	26	27	28	29	30
		AEAW	ACAG	ACON	ATSV	ATOU	ASER	AFIN	APUB	CMAI	CSTA
50	CCON	6,284.5	89.6	26,826.4	20,814.4	76.4	931.6	6,210.0	143,887.1		
51	CTSV	5,336.6	3,182.1	9,362.6	87,624.0	133.9	633.2	48,423.9	14,685.6		
52	CTOU				3,968.3				215.4		
53	CSER				42,614.0	35.1	3,741.5	9,633.9	470.5		
54	CFIN	7,473.0	1,061.6	42,925.8	229,660.3	421.3	3,644.4	131,260.9	30,252.9		
55	CPUB			474.5	1,485.3		571.6	605.5	8,852.8		
56	CMME									1,888.2	17.8
57	CMMI									6,954.3	7.9
58	CMMD									14,812.9	9,041.0
59	LNONE	56.1	306.0	1,093.7	64,098.1	974.4	3,254.3	10,676.8	5,108.0		
60	LPRIM	1,890.0	4,812.9	7,383.4	134,341.3	7,718.7	11,912.7	37,268.6	21,232.7		
61	LSECO	5,822.1	12,290.5	10,141.3	102,961.1	11,178.1	55,984.8	25,802.5	83,324.3		
62	LPOST	2,290.7	2,718.9	1,275.4	13,975.5	1,968.7	9,823.3	4,735.4	38,922.1		
63	KAP	114,753.4	15,864.2	24,069.2	229,177.4	8,478.9	16,309.9	137,307.9	44,038.9		
64	LAND										
65	HHMH										
66	HHML										
67	HHNU										
68	HHNR										
69	ENTR										
70	GOVR										
71	DIRTX										
72	VATAX	2,256.5	21,303.0	3,600.4	12,244.5	998.8	1,647.6	2,364.6	712.1		
73	INDTX									113.5	55.6
74	TARIFFS									940.2	
75	WORLD									30,748.5	34.0
76	KACCOUN										
77	TOTAL	203,057.6	99,345.8	352,637.4	1,198,239.1	35,794.3	135,926.1	452,096.7	506,583.5	117,614.1	39,516.1

Table A8 (continued): The 1995 social accounting matrix for Zambia

		31	32	33	34	35	36	37	38	39	40
		CGNT	CSUG	CCOT	CTOB	CCOF	CWHE	CHCR	COCR	CLIV	CFIS
1	ASMA										
2	ALMA										
3	ASTA										
4	AGNT	16,906.0									
5	ASUG		11,677.4								
6	ACOT			17,727.1							
7	ATOB				10,821.7						
8	ACOF					9,178.2					
9	AWHE						20,940.4				
10	AHCR							78,357.8			
11	AOCR								54,158.0		
12	ALIV									98,375.0	
13	AFIS										117,064.5
14	AFOY										
15	AMIN										
16	AFBT										
17	ATAG										
18	AWAF										
19	AFER										
20	AOMA										
21	AEAW										
22	ACAG										
23	ACON										
24	ATSV										
25	ATOU										
26	ASER										
27	AFIN										
28	APUB										
29	CMAI										
30	CSTA										
31	CGNT										
32	CSUG										
33	CCOT										
34	CTOB										
35	CCOF										
36	CWHE										
37	CHCR										
38	COCR										
39	CLIV										
40	CFIS										
41	CFOY										
42	CMIN										
43	CFBT										
44	CTAG										
45	CWAF										
46	CFER										
47	COMA										
48	CEAW										
49	CCAG										

Table A8 (continued): The 1995 social accounting matrix for Zambia

		31	32	33	34	35	36	37	38	39	40
		CGNT	CSUG	CCOT	CTOB	CCOF	CWHE	CHCR	COCR	CLIV	CFIS
50	CCON										
51	CTSV										
52	CTOU										
53	CSER										
54	CFIN										
55	CPUB										
56	CMME	119.4		463.2	1,225.9	920.1	9.5	966.6	815.5	658.7	15.4
57	CMMI	39.0		2,140.1	350.0		1,791.5	1,108.7	1,178.5	258.8	15.6
58	CMMD	4,920.8	3,415.0	5,515.6	2,101.1	1,808.5	6,806.2	9,249.8	6,220.7	25,264.9	41,129.2
59	LNONE										
60	LPRIM										
61	LSECO										
62	LPOST										
63	KAP										
64	LAND										
65	HHMH										
66	HHML										
67	HHNU										
68	HHNR										
69	ENTR										
70	GOVR										
71	DIRTX										
72	VATAX										
73	INDTX	30.9	21.4	32.5	19.8	16.8	38.4	143.3	99.0	180.4	64.2
74	TARIFFS			9.7	35.3		1,503.4	902.7	616.0	193.8	6.2
75	WORLD	177.1		9,736.9	1,554.6	17.5	6,656.2	4,123.6	4,736.9	986.1	64.9
76	KACCOUN										
77	TOTAL	22,193.2	15,113.7	35,625.2	16,108.4	11,941.0	37,745.5	94,852.6	67,824.8	125,917.6	158,360.0

Table A8 (continued): The 1995 social accounting matrix for Zambia

		41	42	43	44	45	46	47	48	49	50
		CFOY	CMIN	CFBT	CTAG	CWAF	CFER	COMA	CEAW	CCAG	CCON
1	ASMA										
2	ALMA										
3	ASTA										
4	AGNT										
5	ASUG										
6	ACOT										
7	ATOB										
8	ACOF										
9	AWHE										
10	AHCR										
11	AOCR										
12	ALIV										
13	AFIS										
14	AFOY	26,945.1									
15	AMIN		703,164.2								
16	AFBT			557,740.0							
17	ATAG				166,655.4						
18	AWAF					115,885.6					
19	AFER						14,392.9				
20	AOMA							224,666.9			
21	AEAW								203,057.6		
22	ACAG									99,345.8	
23	ACON										352,637.4
24	ATSV										
25	ATOU										
26	ASER										
27	AFIN										
28	APUB										
29	CMAI										
30	CSTA										
31	CGNT										
32	CSUG										
33	CCOT										
34	CTOB										
35	CCOF										
36	CWHE										
37	CHCR										
38	COCR										
39	CLIV										
40	CFIS										
41	CFOY										
42	CMIN										
43	CFBT										
44	CTAG										
45	CWAF										
46	CFER										
47	COMA										
48	CEAW										
49	CCAG										

Table A8 (continued): The 1995 social accounting matrix for Zambia

		41	42	43	44	45	46	47	48	49	50
		CFOY	CMIN	CFBT	CTAG	CWAF	CFER	COMA	CEAW	CCAG	CCON
50	CCON										
51	CTSV										
52	CTOU										
53	CSER										
54	CFIN										
55	CPUB										
56	CMME	18.4	167,474.0	5,272.5	8,317.0	468.6	299.6	7,639.4		3,879.0	
57	CMMI	9.6	4,068.5	12,468.4	7,608.7	17,047.1	13,569.1	59,171.9		113,385.0	
58	CMMD	2,986.5	38,992.7	158,224.9	39,491.9	37,350.9	9,366.5	80,928.4		63,701.1	
59	LNONE										
60	LPRIM										
61	LSECO										
62	LPOST										
63	KAP										
64	LAND										
65	HHMH										
66	HHML										
67	HHNU										
68	HHNR										
	ENTR										
70	GOVR										
71	DIRTX										
72	VATAX										
73	INDTX		3,274.6	19,133.9		24.1		24,432.7		101.5	690.9
	TARIFFS	9.6		5,949.4	6,761.6		2,241.4	22,604.5		80,341.7	
75	WORLD	34.1	15,298.0	50,903.5	27,895.0	72,566.9	59,631.4	247,874.7	408.5	438,103.8	
76	KACCOUN										
77	TOTAL	30,055.9	935,378.7	809,692.6	256,729.6	248,532.8	102,950.9	667,318.4	203,545.7	798,857.9	353,328.3

Table A8 (continued): The 1995 social accounting matrix for Zambia

		51	52	53	54	55	56	57	58	59	60
		CTSV	CTOU	CSER	CFIN	CPUB	CMME	CMMI	CMMD	LNONE	LPRIM
1	ASMA										
2	ALMA										
3	ASTA										
4	AGNT										
5	ASUG										
6	ACOT										
7	ATOB										
8	ACOF										
9	AWHE										
	AHCR										
11	AOCR										
12	ALIV										
13	AFIS										
14	AFOY										
15	AMIN										
16	AFBT										
17	ATAG										
18	AWAF										
19	AFER										
20	AOMA										
21	AEAW										
22	ACAG										
23	ACON										
24	ATSV	1,198,239.1									
25	ATOU		35,794.3								
26	ASER			135,926.1							
27	AFIN				452,096.7						
28	APUB					506,583.5					
29	CMAI										
30	CSTA										
31	CGNT										
32	CSUG										
33	CCOT										
34	CTOB										
35	CCOF										
36	CWHE										
37	CHCR										
38	COCR										
39	CLIV										
40	CFIS										
41	CFOY										
42	CMIN										
43	CFBT										
44	CTAG										
45	CWAF										
46	CFER										
47	COMA										
48	CEAW										
49	CCAG										

Table A8 (continued): The 1995 social accounting matrix for Zambia

		51	52	53	54	55	56	57	58	59	60
		CTSV	CTOU	CSER	CFIN	CPUB	CMME	CMMI	CMMD	LNONE	LPRIM
50	CCON										
51	CTSV						200,469.0	241,172.7	561,328.6		
52	CTOU										
53	CSER										
54	CFIN										
55	CPUB										
56	CMME										
57	CMMI										
58	CMMD										
59	LNONE										
60	LPRIM										
61	LSECO										
62	LPOST										
63	KAP										
64	LAND										
65	HHMH										23,849.4
66	HHML										164,594.2
67	HHNU										37,955.6
68	HHNR										437,336.7
69	ENTR										
70	GOVR										
71	DIRTX										
72	VATAX										
73	INDTX		33,273.1			237.9					
74	TARIFFS	11,745.8			22,597.8						
75	WORLD	87,640.6			169,042.3						
76	KACCOUN										
77	TOTAL	1,297,625.5	69,067.5	135,926.1	643,736.7	506,821.5	200,469.0	241,172.7	561,328.6		663,735.9

Table A8 (continued): The 1995 social accounting matrix for Zambia

		61	62	63	64	65	66	67	68	69
		LSECO	LPOST	KAP	LAND	HHMH	HHML	HHNU	HHNR	ENTR
1	ASMA					190.3	4,522.3	9,049.4	94,954.0	
2	ALMA									
3	ASTA									
4	AGNT									
5	ASUG					14.2	183.7	300.8	612.5	
6	ACOT									
7	ATOB								15.0	
8	ACOF									
9	AWHE									
10	AHCR					1,488.7	9,938.8	20,385.7	51,331.9	
11	AOCR					144.9	1,742.4	3,450.1	37,092.9	
12	ALIV					127.9	1,085.2	2,265.4	6,878.3	
13	AFIS					81.4	385.0	795.6	11,878.3	
14	AFOY					509.4	6,328.8	12,607.0	82,776.4	
15	AMIN									
16	AFBT					1,086.8	8,520.6	17,688.7	66,590.8	
17	ATAG									
18	AWAF									
19	AFER									
20	AOMA									
21	AEAW									
22	ACAG									
23	ACON									
24	ATSV									
25	ATOU									
26	ASER									
27	AFIN									
28	APUB									
29	CMAI					1,498.0	13,529.5	6,275.2	55,215.0	
30	CSTA					33.1	106.5	200.0	1,663.0	
31	CGNT					82.8	601.3	62.4	554.3	
32	CSUG					42.0	106.9	110.2	1,018.9	
33	CCOT									
34	CTOB									
35	CCOF					233.9	304.0		16.0	
36	CWHE									
37	CHCR					9,786.5	36,253.8	3,104.7	30,474.4	
38	COCR					6,557.8	23,669.0	2,326.7	21,172.7	
39	CLIV					11,624.5	19,495.5	3,383.8	21,735.7	
40	CFIS					3,143.0	10,034.2	1,648.2	13,500.5	
41	CFOY					108.2	1,952.3	292.7	8,448.8	
42	CMIN									
43	CFBT					92,897.8	292,184.0	31,300.9	272,650.1	
44	CTAG					14,589.9	30,278.1	8,870.9	64,027.1	
45	CWAF					10,056.9	12,922.2	1,656.8	17,558.2	
46	CFER					426.2	301.2	20.0	173.7	
47	COMA					22,164.9	54,324.0	7,745.7	68,165.5	
48	CEAW					5,685.2	6,745.2	808.0	7,435.2	
49	CCAG					46,887.3	14,377.7	2,561.4	20,964.6	

Table A8 (continued): The 1995 social accounting matrix for Zambia

		61	62	63	64	65	66	67	68	69
		LSECO	LPOST	KAP	LAND	HHMH	HHML	HHNU	HHNR	ENTR
50	CCON					7,065.7	656.1	255.1	2,218.1	
51	CTSV					11,752.5	22,332.6	3,383.2	28,900.4	
52	CTOU					7,719.4	8,578.3	1,678.5	15,446.9	
53	CSER					18,733.9	20,164.7	3,678.7	32,075.9	
54	CFIN					23,014.4	32,516.2	6,671.6	53,648.2	
55	CPUB					4,170.0	4,146.2	2,098.4	18,177.9	
56	CMME									
57	CMMI									
58	CMMD									
59	LNONE									
60	LPRIM									
61	LSECO									
62	LPOST									
63	KAP									
64	LAND									
65	HHMH	69,648.7	38,506.7							316,568.9
66	HHML	198,965.7	29,404.8							194,194.4
67	HHNU	16,985.6	2,040.4							86,032.1
68	HHNR	133,225.6	20,261.7		43,705.5					316,077.8
69	ENTR			1,252,176.0						
70	GOVR									
71	DIRTX					134,153.0				56,309.0
72	VATAX									
73	INDTX									
74	TARIFFS									
75	WORLD					17,667.8				235,434.1
76	KACCOUN					10,152.4	32,600.4	1,807.8	8,691.3	47,559.6
77	TOTAL	418,825.5	90,213.5	1,252,176.0	43,705.5	463,890.4	670,886.6	156,483.2	1,116,062.4	1,252,176.0

Table A8 (continued): The 1995 social accounting matrix for Zambia

		69	70	71	72	73	74	75	76	77
		ENTR	GOVR	DIRTX	VATAX	INDTX	TARIFFS	WORLD	KACCOUN	TOTAL
1	ASMA									130,679.9
2	ALMA									40,192.5
3	ASTA									30,359.7
4	AGNT									16,906.0
5	ASUG									12,788.5
6	ACOT									17,727.1
7	ATOB									10,836.7
8	ACOF									9,178.2
9	AWHE									20,940.4
10	AHCR									161,502.8
11	AOCR									96,588.3
12	ALIV									108,731.7
13	AFIS									130,204.8
14	AFOY									129,166.7
15	AMIN									703,164.2
16	AFBT									651,626.9
17	ATAG									166,655.4
18	AWAF									115,885.6
19	AFER									14,392.9
20	AOMA									224,666.9
21	AEAW									203,057.6
22	ACAG									99,345.8
23	ACON									352,637.4
24	ATSV									1,198,239.1
25	ATOU									35,794.3
26	ASER									135,926.1
27	AFIN									452,096.7
28	APUB									506,583.5
29	CMAI							8,121.9		117,614.1
30	CSTA							83.9		39,516.1
31	CGNT							505.6		22,193.2
32	CSUG									15,113.7
33	CCOT							1,663.8		35,625.2
34	CTOB							4,952.2		16,108.4
35	CCOF							3,657.8		11,941.0
36	CWHE							44.4		37,745.5
37	CHCR							5,016.3		94,852.6
38	COCR							3,787.9		67,824.8
39	CLIV							1,784.5		125,917.6
40	CFIS							72.2		158,360.0
41	CFOY							87.9		30,055.9
42	CMIN							848,891.8		935,378.7
43	CFBT							20,625.3		809,692.6
44	CTAG							24,833.4		256,729.6
45	CWAF							2,241.1		248,532.8
46	CFER							1,321.3		102,950.9
47	COMA							31,106.5		667,318.4
48	CEAW							56,320.3		203,545.7
49	CCAG							13,431.3	351,157.5	798,857.9

Table A8 (continued): The 1995 social accounting matrix for Zambia

		69	70	71	72	73	74	75	76	77
		ENTR	GOVR	DIRTX	VATAX	INDTX	TARIFFS	WORLD	KACCOUN	TOTAL
50	CCON								126,759.5	353,328.3
51	CTSV									1,297,625.5
52	CTOU							31,426.1		69,067.5
53	CSER									135,926.1
54	CFIN							22,365.6		643,736.7
55	CPUB		464,049.0							506,821.5
56	CMME									200,469.0
57	CMMI									241,172.7
58	CMMD									561,328.6
59	LNONE									170,557.6
60	LPRIM									663,735.9
61	LSECO									418,825.5
62	LPOST									90,213.5
63	KAP									1,252,176.0
64	LAND									43,705.5
65	HHMH	316,568.9	13,118.8							463,890.4
66	HHML	194,194.4	61,549.1							670,886.6
67	HHNU	86,032.1	3,249.3							156,483.2
68	HHNR	316,077.8	29,494.1							1,116,062.4
69	ENTR									1,252,176.0
70	GOVR			190,462.0	108,786.0	85,487.0	164,835.0			549,570.0
71	DIRTX	56,309.0								190,462.0
72	VATAX									108,786.0
73	INDTX									85,487.0
74	TARIFFS									164,835.0
75	WORLD	235,434.1								1,481,336.9
76	KACCOUN	47,559.6	-21,890.4					398,995.9		477,917.0
77	TOTAL	1,252,176.0	549,570.0	190,462.0	108,786.0	85,487.0	164,835.0	1,481,336.9	477,917.0	

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