December 1990

A.E.Res. 90-15

A Social Accounting Matrix for Cameroon

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* This paper also appeared as a Cornell Food and Nutrition Policy Program Working Paper. Cornell University, Ithaca, New York.

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ABSTRACT

This paper presents the details of a Social Accounting Matrix (SAM) developed for Cameroon. The SAM represents an empirically consistent and disaggregated data framework, presented in matrix format, that links economic transactions according to classification of production activities, factors of production, institutions, and socioeconomic groups. It is constructed to focus on the relationships between macroeconomic policies and income distribution in Cameroon, and organizes the data in a framework that serves as the basis for analyzing the effects of policy reforms.

1. INTRODUCTION

This paper presents a social accounting matrix (SAM) for Cameroon, constructed on the basis of 1984/85 data. Intended as a tool for analyzing the structural relationship between production patterns and income distribution, it presents a disaggregated treatment of productive sectors and socio-economic groups. The principal sources of information for construction of the SAM were the national accounts, a 31-sector input/output (I/O) table,[1] a detailed report on the structure of public enterprises, and a national consumption and expenditure survey. A SAM for Cameroon was assembled at the World Bank in the first half of the 1980s (Benjamin and Devarajan 1985a and b) with the main objective of analyzing the role of oil production and exports in the Cameroonian economy. Consequently, this previous SAM has an emphasis on production sectors and contains less information on income and consumption. In order to address the distributional issues set forth in the present study, the construction of a new matrix was required.

In the next section the structure of the SAM and relationships between its components are discussed. This is followed by a section on sources of information and their use in the construction of the matrix. Finally, a description of each of the principal accounts comprising the SAM is presented. Reconciliation of the various sources of information is discussed in the appendix.

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[1] This input/output table was constructed by M. Kingné and M. Ngnenevit at the Direction de la Statistique, in the Ministère du Plan, which provided the information for this study.

2. STRUCTURE AND DEFINITIONS IN A SAM

A SAM is a square matrix divided into submatrices or accounts. Although most SAMs have the same basic structure, the treatment of individual accounts, particularly in terms of level of aggregation, varies widely between studies. The detailed structure of a particular SAM reflects both the objective of the analysis and data availability. The features of the Cameroonian SAM assembled for this study were determined primarily in order to analyze income distribution and to serve as the basis for a computable general equilibrium model (CGE).

There are six basic accounts in a SAM: production, factor, household, government, capital or financial, and foreign (rest-of-world) accounts. Table 1 presents a schematic representation of a SAM showing each of the accounts. Other accounts are often added for various reasons, such as to link two accounts, accommodate data discrepancies, or to ease the process of calculating and balancing a highly disaggregated account. In the present case study, the SAM contains two additional accounts: a marketing margin account, which is a transfer account and redistributes funds between sectors of production, and a commodity account, which links the household and production accounts.

Accounts appear in a SAM at different levels of aggregation. Typically the government, capital, and foreign accounts are included at a more aggregate level than production, factor, and institution (household) accounts,[2] which are disaggregated before being incorporated. The production account depicts the supply side of the economy and can be disaggregated into sectors representing different production activities. The factor account delineates the distribution of value-added resulting from these activities and hence the functional distribution of income. It can be disaggregated into various factors of production, such as labor, capital, or land. Finally, the household account reflects the distribution of income from factors across households, and depicts expenditure and savings. The disaggregation of the production account is based on an I/O table. Although strictly speaking, the production account includes more than intermediate input consumption, it is often referred to as the I/O account. This terminology is adopted here.

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[2] Households can be included in a larger 'institution' account including private companies and the government. In this SAM, however, companies, as recipients of capital value-added, are not separated from households. Government was maintained as a different category from households, although it is likewise a consumer of final goods. Therefore, it seemed appropriate to drop the term 'institution', and instead, treat both the government and households as accounts rather than subaccounts. For further discussion on this subject, see Pyatt and Round (1985).

3. DATA SOURCES

Three main data sources were used in the construction of the SAM. The most important was an I/O table constructed in 1988 by the Ministerè du Plan in Cameroon (*Tableau entrée-sôrtie*, Government of Cameroon 1988).[3] This I/O table is based on the 31-sector national accounts from the year 1984/85 (Government of Cameroon 1987a).[4]

A second source provided valuable information for this analysis: the *Répertoire des entreprises du secteur public et d'economie mixte* (Government of Cameroon 1989), which itemizes companies owned in part or in whole by the government.[5] The distinction between public-sector and private-sector enterprises permits analysis of the effect of a reduction of the government sector on the economy and of privatization issues. These policies are an important and controversial component of structural adjustment reforms pursued in recent years. A great deal of effort was therefore devoted to modifying the production account for the requirements of this analysis and to incorporating new information.

The third source of data used in the SAM is the survey *Enquête-budget-consommation* (EBC), conducted by the Government of Cameroon in 1983/84 (Government of Cameroon unpublished data files). This study collected data on expenditure and revenues from over 5,000 households and also contains information on their demographic and socioeconomic characteristics.[6] Survey data was not entirely processed when the SAM was constructed and therefore only the data on demographics and expenditure were used. The survey was the source of information for disaggregating both the factor and the household accounts. Other sources of information were used occasionally to fill remaining gaps in data. References on these sources are given in the text.

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[3] The original SAM constructed by Benjamin and Devarajan (1985a) was based on an I/O table for the year 1979/80. This I/O table was produced by a private firm at the request of the Cameroonian government. It is based on the National Accounts of Cameroon, which comprise 31 sectors. Almost no documentation was released concerning the construction of the matrix, which restricted its usefulness for the current study.

[4] Cameroonian national accounts use a fiscal year starting July 1.

[5] This document includes information on ownership (shareholders), legal status, revenues, and the number and types of employees.

[6] See Lynch (1990) for a description of the EBC data set and analysis of its statistical characteristics.

4. THE SAM FOR CAMEROON

The I/O table for the year 1984/85 was used as the starting point in assembling the SAM for three reasons: (1) It is based on the national accounts and provides consistent data on production, final demand, trade, and government; (2) the data were considered the most reliable available; and (3) the table is a set of balanced accounts. Moreover, the I/O table provided control totals for rows and columns used in constructing the other accounts. EBC data were used to disaggregate the factor and household accounts. Relative shares were then calculated and applied to aggregate figures from the I/O account to derive the final values entered in the SAM. Since all accounts were consistent with one data source, the task of balancing matrices was minimized. More details on procedures followed to construct the accounts are given in Section 5 and in the appendix.

Accounts were constructed in an order reflecting the degree of reliability of the data.[7] As accounts are assembled, discrepancies arise that force adjustments to the data. Different methods exist to balance individual accounts such as the I/O matrix, including computerized procedures. The commonly used RAS method, for instance, is an algorithm that iteratively adjusts the rows and the columns of a matrix until convergence is reached (Dervis, de Melo, and Robinson 1982, 472).[8]

A SAM is based on the accounting principle of double-entry bookkeeping and every row account has an equivalent column account. The convention is that receipts to accounts are read along the rows and outlays or expenditures down the columns. Tables 2 and 3 present the SAM for Cameroon assembled in this study. Table 2 is an aggregate table and contains values of the aggregate variables identified in Table 1. Table 3 is the complete SAM for Cameroon with disaggregated accounts. Data aggregates shown in matrix entries (Tables 1 and 2) correspond to totals of individual accounts and are subtotals in the larger SAM (Table 3). Row and column totals are economy-wide aggregates and represent economic identities. The basic identity of the I/O table, the total cost equation, can be read from column 1. The accounting equations underlying the SAM are presented in the appendix under "Accounting Identities of the SAM." Row totals must equal corresponding column totals and thus serve as controls

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[7] See Pyatt and Roe (1977) and Dervis, de Melo, and Robinson (1982) for a discussion of this issue.

[8] Details on this procedure can be found in Bacharach (1970).

for balancing the whole matrix. Subtotals in Table 3 are totals of individual accounts and are therefore equal to the values reported in Table 2. Row and column totals by accounts as well as the grand total are the same in both tables.

The definition of aggregates is not always the same in all data sources; those used in the SAM correspond to those recorded in the national accounts. In the case of Cameroon, the foreign account is highly aggregated with only one import component appearing separately as a receipt from the commodity account (intersection of row VIII and column II, in both Tables 1 and 2). The import component of other accounts is included in total consumption (intermediate, final, and capital consumption). Sectoral marketing costs, depicted in the marketing margins (MM) accounts, are calculated in the I/O table as nonproductive activities and sum to zero (see section on marketing margins). The MM account is thus shown with a zero entry in Table 2. In Table 3, however, entries in this account are nonzero and instead contain marketing margin costs disaggregated by sector.

Table 1 - Accounts of the Aggregate SAM

		I Production Activities	II Commodities	III Marketing Margins	IV Factors	V Households	VI Government	VII Capital	VIII ROW	IX **Total**
I	Production activities	Intermediate consumption	Domestic supply					Capital formation + stocks	Exports	**Total output**
II	Commodities					Final consumption	Final consumption			**Domestic sales**
III	Marketing margins	Marketing expenditures								
IV	Factors	Value-added at factor cost								**Factor income**
V	Households				Factor income		Transfers			**Household income**
VI	Government	Indirect taxes	Import taxes			Direct taxes				**Government revenues**
VII	Capital	Depreciation				Savings	Savings		Foreign savings	**Total savings**
VIII	ROW		Imports							**Total imports**
IX	**Total**	**Total cost**	**Total absorption**		**Value-added at factor cost**	**Household expenditure**	**Government expenditure**	**Total investments**	**Total exports**	

Table 2 - Aggregate SAM for Cameroon, 1984/85 (million CFAF)

	Production Activities 1-11	Commodities 12-18	Marketing Margins 19	Factors 20-25	Households 26-32	Government 33	Capital 34	ROW 35	**Total 36**
Activities 1-11	2,215,617	2,665,927	0				955,300	799,890	**6,636,734**
Commodities 12-18					3,222,326	345,326			**3,568,236**
Marketing margins 19	0								**0**
Factors 20-25	3,924,835								**3,924,835**
Households 26-32				3,924,835		43,909			**3,968,744**
Government 33	298,629	174,399			193,090				**666,118**
Capital 34	197,653				552,744	276,883		-71,980	**955,300**
ROW 35		727,910							**727,910**
VIII **Total 36**	**6,636,734**	**3,568,236**	**0**	**3,924,835**	**3,968,744**	**666,118**	**955,300**	**727,910**	**20,447,877**

Table 3 - Disaggregated SAM for Cameroon, 1984/85 (million CFAF)

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
Food agriculture	[1]	29,718	0	0	0	1,190	150	4	0	0	3,055
Export agriculture	[2]	202	20,614	67	1,594	120,142	15,148	38,415	5,080	0	293
Forestry	[3]	0	0	885	0	0	0	38,073	5,031	3,556	0
Modern agriculture	[4]	16	1,594	5	123	9,293	1,172	2,971	393	0	23
Private food industries	[5]	8,371	68	19	5	8,005	454	3,569	467	49	6,855
Public food industries	[6]	1,055	9	2	1	1,009	57	450	59	6	845
Private manufacturing	[7]	21,914	43,885	30,632	3,394	37,598	4,475	339,647	46,224	91,148	170,502
Public manufacturing	[8]	5,075	5,557	2,380	430	12,350	1,146	54,330	8,226	9,209	32,459
Construction	[9]	0	966	139	75	506	64	88	1,022	12,572	15
Private services	[10]	13,833	27,538	40,727	2,130	28,733	3,481	137,625	26,269	33,589	315,422
Public services	[11]	2,505	4,988	7,377	386	5,204	630	24,928	4,758	6,084	57,132
Sub-total		**82,689**	**105,219**	**82,233**	**8,139**	**224,030**	**26,777**	**640,100**	**97,530**	**156,213**	**586,601**
Traditional agriculture	[12]										
Other agriculture	[13]										
Forestry	[14]										
Food products	[15]										
Manufacturing products	[16]										
Construction	[17]										
Services	[18]										
Sub-total											
Marketing margins	[19]	**92,724**	**47,415**	**25,580**	**3,668**	**48,919**	**5,823**	**349,693**	**42,270**	**58,776**	**-652,606**
Agr + informal unskilled	[20]	439,592	328,536	49,604	0	0	0	0	0	0	58,800
Formal unskilled	[21]	0	0	0	13,762	8,227	2,796	139,758	45,465	159,026	0
Skilled	[22]	0	0	0	1,173	25,979	537	343,469	25,960	64,833	647,790
Highly skilled	[23]	0	0	0	1,526	0	534	53,584	18,675	18,403	403,048
Agriculture/capital	[24]	48,844	82,134	12,401	0	0	0	0	0	0	0
Other capital	[25]	0	0	0	10,974	14,660	1,657	230,062	38,614	80,754	195,818
Sub-total		**488,435**	**410,671**	**62,005**	**27,434**	**48,866**	**5,524**	**766,873**	**128,713**	**323,016**	**1,305,457**
Farm north poorest	[26]										
Farm south poorest	[27]										
Farm north+south richest	[28]										
Nonfarm poorest	[29]										
Nonfarm richest	[30]										
Cities poorest	[31]										
Cities richest	[32]										
Sub-total											
Government	[33]	1,818	8,980	14,510	695	9,377	1,110	66,489	10,692	15,261	130,732
Capital	[34]	15,391	4,019	8,303	4,641	6,264	741	76,251	12,261	9,341	46,563
Rest-of-world	[35]										
TOTAL	[36]	681,057	576,304	192,631	44,577	337,455	39,976	1,899,406	291,466	562,607	1,416,747

(continued)

Table 3 (continued)

		[11]	Sub-total	[12]	[13]	[14]	[15]	[16]	[17]	[18]	Sub-total
Food agriculture	[1]	16,212	50,329	566,215							566,215
Export agriculture	[2]	22	201,578		104,212						104,212
Forestry	[3]	0	47,545			100,697					100,697
Modern agriculture	[4]	2	15,592		8,061						8,061
Private food industries	[5]	8,027	35,889				280,050				280,050
Public food industries	[6]	1,009	4,502				32,803				32,803
Private manufacturing	[7]	59,591	849,011					507,451			507,451
Public manufacturing	[8]	12,369	143,531					43,680			43,680
Construction	[9]	3	15,450						13,765		13,765
Private services	[10]	92,158	721,505							568,183	568,183
Public services	[11]	16,692	130,685							440,810	440,810
Sub-total		**206,086**	**2,215,617**	**566,215**	**112,273**	**100,697**	**312,853**	**551,131**	**13,765**	**1,008,993**	**2,665,927**
Traditional agriculture	[12]										
Other agriculture	[13]										
Forestry	[14]										
Food products	[15]										
Manufacturing products	[16]										
Construction	[17]										
Services	[18]										
Sub-total											
Marketing margins	[19]	-22,262	0								
Agr + informal unskilled	[20]	0	876,532								
Formal unskilled	[21]	127,867	496,901								
Skilled	[22]	73,528	1,183,269								
Highly skilled	[23]	102,769	598,539								
Agriculture/capital	[24]		143,379								
Other capital	[25]	53,676	626,215								
Sub-total		**357,841**	**3,924,835**								
Farm north poorest	[26]										
Farm south poorest	[27]										
Farm north+south richest	[28]										
Nonfarm poorest	[29]										
Nonfarm richest	[30]										
Cities poorest	[31]										
Cities richest	[32]										
Sub-total											
Government	[33]	38,965	298,629	2,274	4,609	0	7,093	160,423	0	0	174,399
Capital	[34]	13,878	197,653								
Rest-of-world	[35]			14,932	15,649	0	27,700	643,735	0	25,894	727,910
TOTAL	[36]	**594,508**	**6,636,734**	**583,421**	**132,531**	**100,697**	**347,646**	**1,355,289**	**13,765**	**1,034,887**	**3,568,236**

(continued)

Table 3 (continued)

		[19]	[20]	[21]	[22]	[23]	[24]	[25]	Sub-total	[26]	[27]
Food agriculture	[1]										
Export agriculture	[2]										
Forestry	[3]										
Modern agriculture	[4]										
Private food industries	[5]										
Public food industries	[6]										
Private manufacturing	[7]										
Public manufacturing	[8]										
Construction	[9]										
Private services	[10]										
Public services	[11]										
Sub-total											
Traditional agriculture	[12]									95,518	48,847
Other agriculture	[13]									3,965	15,659
Forestry	[14]									906	798
Food products	[15]									22,280	22,487
Manufacturing products	[16]									24,744	72,600
Construction	[17]									310	592
Services	[18]									5,970	45,162
Sub-total										**153,693**	**206,145**
Marketing margins	[19]										
Agr + informal unskilled	[20]										
Formal unskilled	[21]										
Skilled	[22]										
Highly skilled	[23]										
Agriculture/capital	[24]										
Other capital	[25]										
Sub-total											
Farm north poorest	[26]		261,798	8,454	0	0	0	0	270,253		
Farm south poorest	[27]		268,456	16,543	16,800	4,530	0	0	306,330		
Farm north+south richest	[28]		192,931	11,906	13,713	1,797	143,379	0	363,725		
Nonfarm poorest	[29]		65,176	99,534	196,795	110,092	0	0	471,596		
Nonfarm richest	[30]		25,397	89,381	255,430	154,419	0	156,554	681,180		
Cities poorest	[31]		45,151	160,893	303,680	143,788	0	0	653,513		
Cities richest	[32]		17,623	110,188	396,852	183,914	0	469,661	1,178,239		
Sub-total			**876,532**	**496,901**	**1,183,269**	**598,539**	**143,379**	**626,215**	**3,924,835**		
Government	[33]									13,296	15,071
Capital	[34]									103,264	85,115
Rest-of-world	[35]										
TOTAL	[36]	**0**	**876,532**	**496,901**	**1,183,269**	**598,539**	**143,379**	**626,215**	**3,924,835**	**270,253**	**306,330**

(continued)

Table 3 (continued)

		[28]	[29]	[30]	[31]	[32]	Sub-total	[33]	[34]	[35]	Total
Food agriculture	[1]								58,421	6,092	681,057
Export agriculture	[2]								-2,503	273,017	576,304
Forestry	[3]								12,868	31,521	192,631
Modern agriculture	[4]								-194	21,118	44,577
Private food industries	[5]								3,699	17,817	337,455
Public food industries	[6]								457	2,214	39,976
Private manufacturing	[7]								276,375	266,569	1,899,406
Public manufacturing	[8]								7,056	97,199	291,466
Construction	[9]								533,392	0	562,607
Private services	[10]								55,649	71,409	1,416,747
Public services	[11]								10,080	12,934	594,508
Sub-total									**955,300**	**799,890**	**6,636,734**
Traditional agriculture	[12]	115,663	48,171	118,156	60,097	96,969	583,421				583,421
Other agriculture	[13]	25,406	16,035	34,798	16,063	20,605	132,531				132,531
Forestry	[14]	4,926	7,179	18,158	34,541	34,190	100,697				100,697
Food products	[15]	43,757	31,354	85,528	49,456	92,784	347,646				347,646
Manufacturing products	[16]	112,172	83,238	266,173	208,514	587,847	1,355,289				1,355,289
Construction	[17]	806	615	1,341	4,141	5,958	13,765				13,765
Services	[18]	40,450	49,346	87,896	159,305	301,432	689,561	345,326			1,034,887
Sub-total		**343,181**	**235,938**	**612,050**	**532,118**	**1,139,785**	**3,222,910**	**345,326**			**3,568,236**
Marketing margins	[19]										**0**
Agr + informal unskilled	[20]										876,532
Formal unskilled	[21]										496,901
Skilled	[22]										1,183,269
Highly skilled	[23]										598,539
Agriculture/capital	[24]										143,379
Other capital	[25]										626,215
Sub-total											**3,924,835**
Farm north poorest	[26]										270,253
Farm south poorest	[27]										306,330
Farm north+south richest	[28]										363,725
Nonfarm poorest	[29]										471,596
Nonfarm richest	[30]							8,782			689,961
Cities poorest	[31]										653,513
Cities richest	[32]							35,127			1,213,366
Sub-total								**43,909**			**3,968,744**
Government	[33]	17,894	23,201	33,512	32,151	57,966	193,090				666,118
Capital	[34]	2,650	212,457	44,400	89,244	15,615	552,744	276,883		-71,980	955,300
Rest-of-world	[35]										727,910
TOTAL	[36]	**363,725**	**471,596**	**689,961**	**653,513**	**1,213,366**	**3,968,744**	**666,118**	**955,300**	**727,910**	**20,447,877**

5. DISAGGREGATED ACCOUNTS

PRODUCTION ACCOUNT

The production account was assembled from the I/O table based on the national accounts and from the document *Répertoire* on public-sector enterprises (see "Data Sources" above). The sectoral split of the production account was achieved by first aggregating the 31 sectors of the I/O table (Government of Cameroon) into seven sectors: food agriculture, export agriculture, forestry, food industries, manufacturing industries, construction, and services (see the appendix under "Procedures Used in Assembling the I/O Account" for the list of industries included in each aggregate sector (Appendix Table 1). Second, based on information drawn from the document *Répertoire*, four of the seven sectors were divided between public and private components. These four sectors are export agriculture, food industries, manufacturing industries, and services. This procedure resulted in a total of 11 sectors in the I/O block of the final version of the SAM. Private and public agriculture are shown on the table as export agriculture and modern agriculture, respectively.

The Government of Cameroon I/O table (1988) was used as the starting point in constructing the SAM as it was a set of balanced accounts and provided much of the necessary data. The task of constructing the aggregate I/O table for the production account (Table 4) was done in two steps. First, each variable (intermediate consumption flows and aggregate variables) was aggregated into seven sectors and then was split into private/public activities in the four sectors concerned—export agriculture, food industries, manufacturing industries, and services (see previous paragraph). The first step was straightforward but the second was more problematic since data on the public sector was not available for all variables. In most cases, the value of production (gross output) was known, so production shares were used to make the split.

These shares were calculated in the four sectors concerned as the ratio of the output of one component (private or public) over the output of private and public combined. The use of production values as a sharing factor is justified if the variable to be disaggregated is correlated with production. In some cases, a variable other than production was used instead (details on these particular procedures are given in the appendix under "Procedures Used in Assembling the I/O Account"). Some adjustments were made also in splitting exports in manufacturing industries. These adjustments were necessary because oil exports represent a large portion of total exports for the sector and the oil industry is largely controlled by the public sector through the Société Nationale des Hydrocarbures (SNH).

Table 4 - Aggregate Variables of the 11-Sector Input/Output Account (million CFAF)

	Food	Export Agri-culture	Modern Agri-culture	Modern Fores-try	Private Food Agri-culture	Private Food Indus-tries	Private Indus-tries	Public Manufac-turing	Manufac-turing	Cons-truction	Private Services	Public Services	Total
Column variables													
Intermediate consumption	82,689	105,219	82,233	8,139	224,030	26,777	640,100	97,530	156,213	586,601	206,086	2,215,617	
Value-added	488,435	410,670	62,005	27,435	48,866	5,524	766,873	128,713	323,016	1,305,457	357,841	3,924,835	
Indirect taxes	1,818	8,980	14,510	695	9,377	1,110	66,489	10,692	15,261	130,732	38,965	298,629	
Depreciation	15,391	4,019	8,303	4,641	6,264	741	76,251	12,261	9,341	46,563	13,878	197,653	
Production	588,333	528,889	167,051	40,909	288,536	34,153	1,549,713	249,196	503,831	2,069,353	616,770	6,636,734	
Marketing margins	92,724	47,415	25,580	3,668	48,919	5,823	349,693	42,270	58,776	-652,606	-22,262	0	
Total cost	**681,057**	**576,304**	**192,631**	**44,577**	**337,455**	**39,976**	**1,899,406**	**291,466**	**562,607**	**1,416,747**	**594,508**	**6,636,734**	
Row variables													
Intermediate uses	50,329	201,578	47,545	15,592	35,889	4,502	849,011	143,531	15,450	721,505	130,685	2,215,617	
Household consumption	583,421	123,016	100,697	9,515	311,010	36,636	1,269,914	85,375	13,765	590,106	99,455	3,222,910	
Government consumption	0	0	0	0	0	0	0	0	0	0	345,326	345,326	
Capital formation	52,583	0	13,146	0	0	0	271,204	6,138	530,200	55,649	10,080	939,000	
Variation in stocks	5,838	-2,503	-278	-194	3,699	457	5,171	918	3,192	0	0	16,300	
Exports	6,092	273,017	31,521	21,118	17,817	2,214	266,569	97,199	0	71,409	12,934	799,890	
Total uses	**698,263**	**595,108**	**192,631**	**46,031**	**368,415**	**43,809**	**2,661,869**	**333,161**	**562,607**	**1,438,670**	**598,479**	**7,539,043**	

Sources: Government of Cameroon (1988 and 1989).

The procedure implicitly constrains the composition of intermediate inputs in public and private enterprises to be the same. Further research could focus on potential differences in intermediate technology. The I/O matrix of intermediate consumption flows for the 11 sectors is shown in the SAM (Table 3) at the intersection of rows and columns 1 to 11.

Aggregate variables from the I/O table serve as control totals and can be distinguished between column variables (accounting for total costs of sectors) and row variables (accounting for total uses). Aggregate values for the 11 sectors of the Cameroon SAM are presented in Table 4. The column variables can be read down the columns of the production account as payments to other row accounts. Total cost by sector is equal to production cost plus marketing margins. Production values enter the SAM (Table 3) in terms of cost components: intermediate consumption plus value-added at factor cost plus depreciation plus indirect taxes (producer taxes). Intermediate consumption is the sum of intermediate flows and is paid back to production activities (the first row subtotal of the production account in Table 3). Value-added at factor cost includes returns to both labor and capital as well as other factors. Indirect taxes paid by producing sectors to the government enter Table 3 at the intersection with the government account (row 33). Depreciation, finally, is the replacement cost of fixed capital and enters as a payment to the capital account (row 34). Marketing margins are paid by producers to the service sectors. They enter as positive (as expenditure) in all sectors, except in the two service sectors where they are shown as negative (as receipts).

In every case where separately identified, private sectors are more important in terms of production than public sectors, as can be seen in Table 4. Since the other variables (both column and row variables) were split between public and private components based on production shares--except for value-added and depreciation (see appendix under "Procedures Used in Assembling the I/O Account")--the relative importance of private over public sectors is the same for all variables. Private services is the largest sector both in terms of production and value-added. Private manufacturing has a smaller production but a larger intermediate consumption than private services. 'Production' has a similar value in each of the two traditional agricultural sectors, as does 'value-added', although consumption of intermediate inputs is higher in the export agriculture sector. Marketing margin costs are much higher in food agriculture than in the export agriculture sector.

These sectoral differences are important as they determine different patterns of indirect effects; for instance, given an equiproportional change in production, the indirect effect on factor income will be more important if the change originates from the services sector rather than from manufacturing. However, a change in manufacturing production will have a relatively higher impact on intermediate demand and hence will induce production responses in other sectors. These sectoral production changes will in turn affect factor income through a second round of indirect effects. The distribution and magnitude of these indirect effects will depend on the structure of intermediate demand, and can be measured within the SAM using multiplier analysis.

The row variables from the 11-sector I/O table (Table 4) account for total uses of sectoral production. Row variables can be interpreted in the production accounts (rows 1 to 11) as revenues from other accounts. The sum of the six row variables equal total uses. Household consumption represents all private final demand of products and services not accounted elsewhere since it is calculated as a residual. Household consumption represents more than 80 percent of total uses of food agriculture and private and public food industries production; by comparison, it represents 50 percent of modern agriculture uses and 40 percent of private services. The importance of intermediate uses in these other sectors is significantly higher. By construction, government consumption is directed entirely to public services. The government is treated as a sector of activity (included here in public services) but without commercial activities. Intermediate transactions and services not provided to households are included as final consumption of public administration.

Capital formation was selectively attributed to certain activities of the original I/O table (Government of Cameroon 1988, documentation on pages 17-19) that are included in the aggregate I/O account in food agriculture, forestry, manufacturing industries, construction, and services. Capital formation in the forestry and food agriculture sectors comes from production of livestock for breeding and from seedlings, which are considered to be capital goods. We note that more than 90 percent of production in the construction sector goes to capital formation. The sum of capital formation and variation in stocks is the total payment of the capital account to activities (column subtotal 34 in Table 3).

Exports are assumed to be shipped directly by producers and hence, unlike imports, are not translated into commodities. Exports are receipts to activities from the foreign account (row subtotal 35, in Table 3). The largest export sectors, in absolute magnitude, are export agriculture and private manufacturing. In proportional terms, however, exports represent only 10 percent of private manufacturing production while they account for more than 45 percent in both the export agriculture and forestry sectors. In proportional terms, they are more important in public manufacturing than private because of the importance of oil exports, which are mainly under government control. There are no exports in the construction sector, which is the only pure nontraded sector in this SAM.

In terms of accounting, it should be noted that the difference between total uses and total cost of sectors is made up by imports and import duties, which are included in final demand in this I/O table (see accounting identities listed in appendix). Imports are sold in the domestic market and thus are included in the SAM as commodities rather than production goods.

COMMODITY ACCOUNT

The commodity account is the link between demand (from households and the government) and the supply of goods and services in the economy. Demand is

met by goods produced domestically and by imports. This SAM does not distinguish between private and public sector goods and they are aggregated in the commodity categories. Although this is justified in some cases, in others, such as services, it is likely that consumers do in fact distinguish between private and public provision of goods. Further research could investigate the possibility of taking into account this imperfect substitution between private and public production of goods at a later stage of the modeling process.

The breakdown into commodity categories was determined from EBC data (Government of Cameroon unpublished data files). Disaggregated household expenditure was allocated to seven categories consistent with production activities. Table 5 shows the list of commodity aggregates and the correspondence with the 11 sectors of production.[9] These data were used to construct the expenditure matrix discussed in the "Household Account" section below. The commodity account (rows and columns 12 to 18, Table 3) includes in columns the matrix of domestic supply and vectors of imports and import duties; these are discussed below in this section. In the rows, the commodity account includes the matrix of household expenditure and vector of government expenditure. These are discussed in the two sections below that deal with household and government accounts.

The matrix of domestic supply maps the demand for consumption commodities into production of goods and services. It is included in Table 3 at the intersection of the production and the commodity account. Matrix entries represent payments to production activities in the domestic market. They also correspond to the portion of domestic output that goes to final consumption and are effectively calculated as household and government consumption minus total imports (inclusive of import duties). Imports enter at the intersection of the commodity and foreign accounts (row 35) and represent payments from the domestic market to the rest-of-the world. Import duties are paid to the government and thus are found at the intersection with the government account (row 33).

Manufactured products constitute the largest component of imports and account for 88 percent of the total. Manufactured imports also represent almost 50 percent of consumption of manufactures. In contrast, imports account for less than 10 percent of consumption in the two food categories (1 and 4). This reflects Cameroon's high level of food self-sufficiency. There are no imports of wood products or construction. The forestry sector, however, has an export component.

FACTOR ACCOUNT

The factor account is a crucial component in an analysis of distributional issues as it links the production side of the economy to household income.

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[9] See the appendix for the list of EBC product codes included in each commodity category ("Allocation of EBC Expenditure to Commodity Categories").

Table 5 - Correspondence of Production Sectors and Commodity Aggregates

PRODUCTION SECTORS

[1] Food agriculture

[2] Export agriculture

[3] Forestry

[4] Modern agriculture

[5] Food industries/private

[6] Food industries/public

[7] Manufacturing industries/private

[8] Manufacturing industries/public

[9] Construction

[10] Services/private

[11] Services/public

COMMODITY AGGREGATES

[1]	Traditional agriculture	[1]
[2]	Other agriculture	[2] + [4]
[3]	Forestry	[3]
[4]	Food products	[5] + [6]
[5]	Manufacturing products	[7] + [8]
[6]	Construction	[9]
[7]	Services	[10] + [11]

In a SAM, the households are the owners of factors of production, and returns from productive activities accrue directly to the households according to their factor endowment. The value-added accruing to different factor categories (that is, various types of labor, capital, land, etc.) are determined in the factor account. The factor account maps the value-added from production to household income and thus depicts the socioeconomic aspect of the income distribution.

The construction of the factor account requires the determination of rates of return to each category of factors, which necessarily limits the number of categories that can be defined in a meaningful way. Data on wage rates as well as rental rates for capital and land are scarce in most developing countries. This is the case in Cameroon where no value for land can be assigned[10] and values for productive capital can be determined only imperfectly. Value-added is therefore disaggregated into four categories of labor and two categories of capital. Different rates of return are associated with each of these categories and the share of capital is treated as a residual.

The factor account contains two components requiring an intricate task of disaggregation and data reconciliation. The first component is the matrix allocating sectoral value-added to factor categories. The second is the matrix distributing value-added by factor categories to individuals by household group. This matrix will be discussed in the "Household Account" section below.

Three sources of data were used in assembling the factor account. Employment figures by labor categories, sector of activities, and household groups were all derived from the EBC. Complementary figures on employment by labor categories in public sectors were obtained from the document *Répertoire* (Government of Cameroon 1988). Employment figures were obtained from the EBC, which contains occupational data in the demographic file. These data are not sufficient to describe the labor market fully. Thus the factor account in this SAM (as in most SAMs) does not portray a labor market in a functional sense but merely a mapping of value-added from production activities to household factor income. In this respect, however, it is the key component of income determination.

Breakdown into Factor Categories

EBC data allowed estimates to be made of the number of people employed, their sector of activity, and their skill level. The allocation of individuals to skill categories was primarily based on job description and to some extent

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[10] Land markets, where they exist, are unreliable guides to true land values. Traditional forms of land tenure make determination of contribution to value-added very difficult.

on education level and job status.[11] The functional difference between skill categories takes place in terms of the rate of return, a higher skill level being associated with a higher wage rate. This hierarchy in wages is only partially associated with an equivalent hierarchy in education level, training, and experience. In practice we observe, for example, that a successful entrepreneur without formal education can earn an income similar to that of a high-level government employee or a professional. All three are then classified in the same labor category on the basis of a similar rate of return for their labor.

The following four categories of labor associated with increasing wage rates are distinguished in the SAM: agricultural- and informal-sector unskilled labor, formal-sector unskilled labor, skilled labor, and highly skilled labor. Categories 1 and 2 are mutually exclusive: category 1 includes all labor in traditional agricultural sectors (sectors 1, 2, and 3 in Table 3), without skill distinction, as well as unskilled labor in private services (sector 10 in Table 3). Unskilled labor in all other sectors fall into category 2. All individuals involved in agriculture, except those employed in the modern sector, are classified in category 1. The available data did not allow the definition of a separate category for hired labor in the traditional agricultural sector. This problem should not, however, be too serious in the case of Cameroon because hired labor represents only about two percent of total labor in traditional agriculture (Government of Cameroon 1987b). Since data was available for the modern sector, which consists mostly of hired labor, the disaggregation into the three categories 2, 3, and 4 was performed. Unskilled labor from private services was included in a lower wage category in order to capture informal-sector effects (lower rate of employment and lower wages). Evidence indicates that the predominance of informal market labor in this category generates, on average, a lower rate of return.

Capital included the various assets used in production. There is no consistent data on markets for productive assets in Cameroon, and such markets are, in most cases, rudimentary. The data available is for capital stock by sector, which is derived from figures on sectoral capital output ratios (see section on the "Production Account" above and Appendix Table 2). Capital stock is assumed to be fixed and immobile between sectors. Residual value-added accrues to capital and therefore rates of return to capital are sector-specific. In order to emphasize differences between capital in agriculture and capital in other activities in Cameroon, there are two categories of capital in the SAM: "agricultural capital" pertains to sectors 1, 2, and 3; "other capital" pertains to all other sectors. In the factor account, however, capital simply receives the residual value-added (total value-added minus labor value-added) in each sector, whether in agriculture or in other sectors.

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[11] Job status categories included self-employed, permanent wage earner, temporary wage earner, and apprentice.

Distribution of Sectoral Value-Added to Factor Categories

The distribution of sectoral value-added to the six factor categories was done in two steps. The first step was to construct the matrix of sectoral employment. Employment figures by labor category were derived from the EBC for aggregate sectors of activity and from the *Répertoire* for disaggregated public sectors. Details on procedures used to construct the employment matrix are given in the appendix section on "Determination of Employment Categories from the EBC." The second step was to translate this matrix of employment into a matrix of value-added, using sectoral figures from the production account. This required some simplifying assumptions. First, it is assumed that the number of workers in each category is constant but is mobile between sectors of production within each category. Thus wage rates are always equalized across sectors and value-added from labor in each sector depends on employment. Value-added that is not due to labor accrues to capital. Since capital stock is fixed and immobile in each sector, the rental rate of capital varies between sectors.

Value-added by sector is recorded in the original I/O (Government of Cameroon 1988) table in separate headings for wage bill and operating surplus (return to other factors of production). These data, however, did not match our definition of labor and capital as values of operating surplus in every sector were much too large in comparison to the wage bill. Wage bill, in this context, refers to hired labor and does not include returns to self-employed labor, which is incorporated into operating surplus. The two variables (wage bill and operating surplus) were therefore added together under the heading of "total value-added at factor cost." A set of factor shares in production was used to further divide value-added between labor and capital.[12]

The allocation of labor value-added to the four different categories of workers was achieved through the procedure described here (see also the appendix under "Procedures Used in Assembling the 10 Account"). Initially, a set of four relative wage weights was determined. Labor in category 1 was chosen as the numeraire. These weights were determined to reflect wage differentials between labor categories and to be consistent both with available wage information and with wage and saving rates underlying the SAM framework. Multiplication of the matrix of employment by the relative weights (which are the same for all sectors) yielded a matrix of relative returns expressed in terms of category 1 labor. Employment shares for each labor category were calculated from the total return by sector obtained in the weighted matrix. These shares were then multiplied by sectoral labor value-added derived from the I/O table (Government of Cameroon 1988). Hence a distribution of sectoral

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[12] Labor/capital ratios in production were provided by D. Blandford of the OECD (personal communication). These are as follows: food agriculture = 0.9, export agriculture = 0.8, forestry = 0.8, modern agriculture = 0.6, food industries = 0.7, manufacturing industries = 0.7, construction = 0.75, services = 0.85.

value-added to categories of labor and capital was obtained.[13] These figures are presented in Table 6 along with implied wage rates and average rates of return to capital. These rates are calculated as the ratio of total value-added (across sectors) to total employment of capital stock by category.

The largest group in terms of employment is category 1 (agricultural and informal unskilled); in terms of value-added, however, the skilled worker category is more important. Looking at sectors, the largest value-added is generated in private services, predominantly from skilled labor, which represents 50 percent of total value-added in that sector. Private manufacturing industries generate the largest capital value-added outside agriculture and account for more than 35 percent of the total of that category. The average rate of return to each factor category is given on the bottom line. Returns to capital in agriculture are higher than in other sectors. This can be seen as evidence that returns to agricultural land are implicitly incorporated in returns to agricultural capital for these sectors. The matrix depicting the distribution of value-added to factor categories is included in the SAM (Table 3) at the intersection of the factor account (rows 20-25) and the production account (columns 1 to 11).

HOUSEHOLD ACCOUNT

The household account depicts the demand side of the economy in the SAM. Households are both the owners of factors of production, from which most of their income is generated, and the main consumers of goods produced at home and abroad. Household income is either saved or consumed. Savings accrue to the capital account, while consumption is disaggregated into categories of goods and services, translating to demand for goods produced in the economy.

Breakdown into Household Groups

The disaggregation of the household account involved the specification of functional groups according to one or more socioeconomic criteria. This task is crucial for an analysis of income distribution and the selection of household groups should allow differentiation of as many of the determinants of this distribution as possible. Several criteria of household classification are discussed in the literature (Hayden and Round 1983). Two are commonly used, sometimes as a single criterion to classify households, and can be attributed to different approaches to the study of income distribution.

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[13] Verification at this stage was necessary to ensure that the distribution of value-added to factor categories yielded consistent values for wage rates and average rates of return on fixed capital. This check was performed by dividing total value-added (across sectors) either by total employment or by capital stock category, yielding underlying rates of return to factors. Adjustments to weights were then made to ensure that relative returns to skill categories reflected the ascending pattern observed empirically.

Table 6 - Distribution of Sectoral Value-Added to Factors and Average Rates of Return by Categories (million CFAF)

		Agriculture + Informal Unskilled	Formal Unskilled	Skilled	Highly Skilled	Agriculture Capital	Other Capital	Total Value-Added
[1]	Food agriculture	439,592	0	0	0	48,844	0	488,435
[2]	Export agriculture	328,536	0	0	0	82,134	0	410,671
[3]	Forestry	49,604	0	0	0	12,401	0	62,005
[4]	Modern agriculture	0	13,762	1,173	1,526	0	10,974	27,434
[5]	Private food industries	0	8,227	25,979	0	0	14,660	48,866
[6]	Public food industries	0	2,796	537	534	0	1,657	5,524
[7]	Private manufacturing	0	139,758	343,469	53,584	0	230,062	766,873
[8]	Public manufacturing	0	45,465	25,960	18,675	0	38,614	128,713
[9]	Construction	0	159,026	64,833	18,403	0	80,754	323,016
[10]	Private services	58,800	0	647,790	403,048	0	195,818	1,305,457
[11]	Public services	0	127,867	73,528	102,769	0	53,676	357,841
	Total value-added	876,532	496,901	1,183,269	598,539	143,379	626,215	3,924,835
	Employment/capital stock	4,085,246	272,432	232,773	97,916	1,987,683	9,731,939	
	Average return	214,560	1,823,944	5,083,360	6,112,783	72,134	64,346	

Sources: Government of Cameroon (1988 and unpublished data files [EBG]).

The first delineates a household classification according to income percentile, thus emphasizing the static aspect of income distribution. The second criterion specifies household groups based on factor ownership (Dervis, de Melo, and Robinson 1982) and concentrates on income derived from factor ownership, emphasizing the functional aspect of income distribution.[14] To the extent possible, the grouping is based on a combination of static and functional criteria, including socioeconomic characteristics such as rural/urban split, ethnic groups, agroecological differences between regions, and in general any factor that is a source of unequal access to the means of production.

The EBC was used to disaggregate the household on the basis of a combination of characteristics. Households were first classified according to a poor/rich criterion. Total expenditure (on goods, durables, services, and value of home consumption) was used as a proxy for household revenues due to the lack of available data on household income. All expenditure variables were deflated using a regional commodity price index in order to account for differences in cost of living between regions. Per capita income quintiles were derived from the deflated household total expenditure. Households in the two bottom quintiles were then classified as poor, while households in the top three quintiles were classified as rich.

Socioeconomic characteristics of households were used to complete the classification. These characteristics were chosen according to their relevance to the Cameroon case. Two geographical criteria were retained in order to capture regional income disparities. First, households were divided in two groups: "rural" and "Yaoundé-Douala" (urban). The second criterion applied only to rural poor households, which were divided between north and south.[15] A final criterion was used to capture differences in functional determinants of income: rural households were divided between agricultural and nonagricultural on the basis of whether or not the head of the household was a farmer.

Table 7 shows the breakdown of household groups in the SAM. Shares of total average expenditure are given as an indication of the relative income underlying this household classification. The distribution follows an expected pattern: urban households have higher expenditure shares than rural households; poor households in Yaoundé-Douala have a relatively high share in average expenditure (15 percent) compared to rural households, and only the richest nonagricultural households (20 percent) have a higher share. This

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[14] When income from abroad (remittances, transfers, etc.) is important, domestic factor ownership will not be an accurate indicator of income distribution. However, it will capture changes in income distribution resulting from shifts in domestic production, which is the most important determinant of income variation.

[15] Cameroon is divided into 10 administrative provinces. Based on these, the north region in the SAM includes the far north and the northern provinces, and the south includes all the rest.

Table 7 - Average Expenditures of Household Groups, by Commodity Aggregates (CFAF)

	[1] Farm North Poorest	[2] Farm South Poorest	[3] Farm N+S Richest	[4] Nonfarm N+S Poorest	[5] Nonfarm N+S Richest	[6] Yaoundé/ Douala Poorest	[7] Yaoundé/ Douala Richest	**Total**
[1] Traditional agriculture	366,965	187,663	444,360	185,066	453,938	230,884	372,539	**2,241,413**
[2] Other agriculture	15,303	60,434	98,053	61,886	134,302	61,995	79,525	**511,499**
[3] Forestry	267	235	1,452	2,115	5,351	10,178	10,075	**29,672**
[4] Food products	52,111	52,597	102,346	73,337	200,047	115,676	217,019	**813,135**
[5] Manufacturing	20,135	59,077	91,278	67,733	216,592	169,674	478,348	**1,102,836**
[6] Construction	9,016	17,196	23,425	17,880	38,964	120,312	173,098	**399,890**
[7] Services	5,911	44,712	40,047	48,854	87,020	157,717	298,429	**682,690**
Total	**469,708**	**421,914**	**800,961**	**456,871**	**1,136,213**	**866,437**	**1,629,032**	**5,781,135**

Source: Government of Cameroon unpublished data files.

seems to indicate that the poor in large urban areas may be relatively better off than in rural areas at least in terms of average expenditure. The three poorest groups in rural areas have similar expenditure shares (7-8 percent). Most farm households, however, produce agricultural goods that they can consume at home. Although adjustments were made to take home consumption into account in calculating household expenditures, it is probably underestimated. If so, expenditure shares of farm households should be somewhat higher. It is important to note that since farm households with home consumption are likely to be less affected in their consumption pattern by increases in food prices than are nonfarm households, the latter group is potentially more vulnerable to economic recession or policies affecting food markets.

The treatment of household account involved two main tasks. One was to determine household consumption in terms of goods and services produced domestically; this is to construct the mapping between the household and the production block in Table 3. The second was to determine household endowment of factors of production in order to construct the mapping with the factor account. We will first discuss the construction of the expenditure matrix and then turn to the discussion of the factor income matrix.

Derivation of the Expenditure Matrix

Households are the main consuming agents of final goods in a SAM. The expenditure matrix depicts total household demand, which included both imported and/or domestically produced goods by commodity category and by household group. Data on imports by commodity is obtained from the national accounts and allow derivation of the demand for domestically produced goods. This demand is included in the matrix of domestic supply for the commodity account (see "Commodity Account" section above). In order to build the expenditure matrix, data from both the national accounts and the EBC were required: the data on household final demand by commodity category was obtained from the national accounts, while the disaggregation by household group was derived from EBC data. For each household group, expenditure data on goods and services was aggregated into the seven commodity categories defined in the commodity account. Since the number of households per group varies, average figures were calculated by dividing expenditure by category by the number of people in each household group. The shares of each household group in total average expenditure by commodity category were then calculated. These shares were applied to the I/O data (Government of Cameroon 1988) to yield the distribution of final demand by commodity aggregates and household group.

The expenditure matrix is shown in Table 8. The share of each household group in total average household demand is shown on the bottom line of the table. This distribution is comparable to the one obtained from EBC data, discussed in the previous section (see also Table 7). On a disaggregated level, we can see that demand for traditional agricultural products (category 1), which includes basic food products, ranges from 8-10 percent for the poorest households to 17-20 percent for the richest households. Poor house

Table 8 - Expenditure on Goods and Services of Household Groups, by Commodity Aggregates (million CFAF)

	[1] Farm North Poorest	[2] Farm South Poorest	[3] Farm N+S Richest	[4] Nonfarm N+S Poorest	[5] Nonfarm N+S Richest	[6] Yaoundé/ Douala Poorest	[7] Yaoundé/ Douala Richest	Total
[1] Traditional agriculture	95,518	48,847	115,663	48,171	118,156	60,097	96,969	**583,421**
[2] Other agriculture	3,965	15,659	25,406	16,035	34,798	16,063	20,605	**132,531**
[3] Forestry	906	798	4,926	7,179	18,158	34,541	34,190	**100,697**
[4] Food products	22,280	22,487	43,757	31,354	85,528	49,456	92,784	**347,646**
[5] Manufacturing	24,744	72,600	112,172	83,238	266,173	208,514	587,847	**1,355,289**
[6] Construction	310	592	806	615	1,341	4,141	5,958	**13,765**
[7] Services	5,970	45,162	40,450	49,346	87,896	159,305	301,432	**689,561**
Total	**153,693**	**206,145**	**343,181**	**235,938**	**612,050**	**532,118**	**1,139,785**	**3,222,910**
Share of total (percent)	**0.05**	**0.06**	**0.11**	**0.07**	**0.19**	**0.17**	**0.35**	**1.00**

Source: Government of Cameroon (1988 and unpublished data files [EBC]).

holds from the north account for 16 percent of basic food total demand, a share substantially higher than that of other poor household groups. This can be explained by the fact that they produce mostly staple food, in contrast to farm households in the south, which are involved to a larger extent in export agriculture (cocoa, coffee, and tobacco, included in category 2). Moreover, farm households from the north spend more than 75 percent of their total expenditure on category 1 (shares are calculated from EBC data and are not shown in the table), which shows a large dependence on consumption of own production. The richest farm households (group 3) from both the north and the south consume 55 percent of their total expenditure in category 1. This share is substantially lower for urban households at around 25 percent of total expenditure.

Demand for processed food products comes mostly from the two richest household groups (5 and 7), which together account for 52 percent of total final demand of that commodity category. Demand for manufacturing and services comes mainly from these two groups as well, although poorer households in Yaoundé-Douala also account for a significant share of total final demand of these two commodity categories.

Distribution of Factor Income to Households

The second task in assembling the household account is the mapping from the factor account to the household account. This requires the translation of value-added from production into household income by group.

The number of workers and their employment category in each household group were determined from the EBC data. Differences in household size were taken into account by dividing these figures by the number of people in each household group. This yielded a table depicting the average number of workers by labor category and by household group. The shares of each household group in total labor by category were then calculated. These shares, finally, were applied to value-added by category, as given by the factor account to obtain a matrix of value-added by labor category and by household group.

The procedure for allocating capital value-added was based on the assumption that only rich households own capital. All returns from productive capital therefore accrue to three categories of households. Agricultural capital is allocated to the richest farm households (group 3). Other capital is allocated to the richest nonfarm rural households and the richest urban households in the proportion of 25 and 75 percent, respectively. Thus a complete matrix of value-added by factor category and by household group was obtained. This matrix is shown in Table 9. The bottom line of this table shows the share of each household group in total value-added. The distribution is, in general, as expected. We observe that the difference between poor and rich households is much larger in urban areas than in rural areas.

6. AGGREGATE ACCOUNTS

MARKETING MARGIN ACCOUNT

The marketing margin account, shown in row and column 19 of Table 3, represents differences between producer costs and consumer outlays. These margins include transport and handling costs, intermediaries' fees, etc., and are proportional to production. The I/O table for Cameroon (Government of Cameroon 1988) was constructed in such a way that marketing margins in each sector are paid to one sector (commerce) that is included in private services in the aggregate I/O account. Marketing margins are not considered to be productive activities (although they are the output of one sector) and therefore are treated in a separate account. From this perspective, the account reveals positive entries for sectors paying a margin and negative entries for sectors receiving payments, and as a result the row sum of sectoral marketing margins is zero. The corresponding column is empty, however, since both payments and receipts are included in the row account.

GOVERNMENT ACCOUNT

The government account appears in row and column 33 of the SAM (Table 3). The row account depicts government revenues, which are generated by taxes paid by the various agents (Table 1). All figures on tax revenues are derived from national accounts data. Indirect taxes paid by producers are the major source of revenues for the government (Tables 2 and 3) and are included in the I/O table. Import taxes, or tariffs, are shown at the intersection with the commodity account. Figures for direct taxes paid by households from factor income were obtained from the national accounts. The disaggregation by household group was based on the assumption that a single average tax rate applied to every household group. The rate was calculated as the ratio of aggregate direct taxes to aggregate household income, net of transfer (that is, aggregate factor income) and is equal to 0.49.

The column for this sector depicts government expenditure. This is divided into final consumption, transfers, and savings (Table 1). Government consumption of goods and services is fully translated into demand for public services (Table 3). This treatment follows that in the original I/O table. The aggregate figure on government transfers is obtained from the national accounts. Most government transfers in Cameroon are given in the form of public employee benefits. Since government employees are mainly members of household groups 5 and 7, all transfers accrue to these two groups. Government savings, finally, are treated as a residual and therefore are equal to the difference between government revenue (from taxes) and government expenditure (consumption plus transfer). Government revenue is derived from taxes and thus

can vary endogenously (as production and income change). Government expenditure, however, is fixed and can only be changed exogenously. Thus changes in government savings are fully determined by revenues.

CAPITAL ACCOUNT

The capital account appears in row and column 34 of the SAM (Table 3). The row account represents the various sources of savings in the economy while the column account represents investment expenditure. There are four components of savings: depreciation, household savings, government savings, and foreign savings. Depreciation is paid by production sectors as replacement costs on fixed capital. Sectoral depreciation is included in the I/O table and is shown in Table 4. These data are also discussed in the appendix.

Household savings are determined for each household group as the difference between income and expenditure. Although household savings are first calculated as a residual, they are important variables in an analysis of income distribution. Saving rates and average propensity to save specific to each household group can be derived from these figures. Government revenue is derived from taxes and thus can vary endogenously (as production and income change). Government expenditure, however, is fixed and can only be changed exogenously. Thus government savings are fully determined by revenues. Finally, foreign savings are calculated as an overall residual between investment and domestic savings by households and government, and can be negative as is the case here, showing that Cameroon invested abroad in the year 1984/85. This is due to Cameroon's capital surplus from oil revenues, which was to a large extent saved in foreign accounts. Oil exports started to decline after 1985 as oil reserves declined. In more recent years, the country has experienced foreign account deficits and net overseas borrowing.

The column capital account depicts investments in the economy. Investments have two components: capital formation and variations in stocks. These are combined in the SAM and appear at the intersection of column 34 and rows 1 to 11 in Table 3. Thus they are read as payments to production sectors. These figures were obtained from the I/O table (Government of Cameroon 1988) and are part of total uses of production goods (Table 4). While stocks can be accumulated in any sector producing commodities, only some sectors produce capital goods for investments. They are included in sectors 1, 3, and 7 to 11. In food agriculture (sector 1) and forestry (sector 3), production of capital goods comes mainly from breeding livestock and tree crop nurseries; in manufacturing industries (sectors 7 and 8), a variety of capital goods are produced, mostly equipment and materials; almost all production of the construction sector (sector 9) goes to capital formation as buildings are classified as capital goods; in the services sectors (sectors 10 and 11), real estate and various types of land and building improvement services are considered to be capital goods and thus add to capital formation. In Table 3, export agriculture and modern agriculture show negative entries. This implies that variation in stocks was negative that year (these sectors do not produce capital goods) and capital was borrowed from the rest of the economy.

FOREIGN ACCOUNT

The foreign account appears in row and column 35 of the SAM (Table 3). This account is highly aggregated with only imports of consumption goods and services disaggregated. These are recorded in the commodity account as discussed above in the "Commodity Account" section. Imports of intermediate goods used in production are included in total intermediate consumption in the I/O account (row and column 1 to 11) and do not form a separate account. Exports are read from column 35 and are assumed to be shipped directly by production sectors. They are included as total uses of products (see the "Production Account" section above and Table 4). The last entry of this account is foreign savings, discussed above. Foreign capital bridges the gap between imports and exports. Since Cameroon had a trade surplus in 1984/85, its foreign capital account is in deficit by the same amount.

APPENDIX

PROCEDURES USED IN ASSEMBLING THE I/O ACCOUNT

Value of Production

The value of production is taken from the national accounts for the seven aggregate sectors. For the four public sectors, the value of turnover,[16] as given by the document *Répertoire* (Government of Cameroon 1989), was used as a proxy for the value of production. We can identify two problems in making such an approximation. First, turnover will reflect the value of production if there is no inventory variation from beginning to end of the period. Therefore, the smaller the average ratio of inventory to production or the less variable inventories are, the more accurate the figures for our purposes. Secondly, discrepancies can arise in the case of a trust firm or an umbrella organization if part of the activities of the dependent firms is included in the turnover of the head company. This particular problem was encountered with the social security organization, *Caisse Nationale de Prévoyance Sociale* (CNPS). Turnover in *Répertoire* amounts to 50,221 million CFAF while production in the national accounts amounts to 8,198 million CFAF. CNPS is an umbrella organization and manages a large budget that includes funds for activities that it does not perform itself. The value of production as given by the national accounts was used in this case.

Aggregation of the 31-Sector I/O Table

The I/O table in 31 sectors was aggregated into 12 groups following the definition of sectors identified in the SAM (Appendix Table 1).

Private nonprofit services and domestic services (D.S.)—respectively sections B-2 and C of sector 31—were transferred to the aggregate sector 10 (private services) in the SAM. The values of production and intermediate consumption for these two services were given in the national accounts and could be directly subtracted from sector 31 (group XII) and added to group X. Intermediate flows in column 31 were divided on the basis of the relative share of these services in production of sector 31. There is no intermediate use of sector 31 (of either public administration, nonprofit services, or domestic services). Furthermore, in terms of total uses of sector 31, final consumption

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16 Turnover is translated from *chiffres d'affaire* and corresponds roughly to gross revenue.

Appendix Table 1 - Correspondence of Sectors

Group	Sectors of the SAM	Sectors of the I/O Table[a]
I	1	1 + 3 + 4
II	2/4	2
III	3	5
IV	5	9
V	5/6	7 + 8 + 10
VI	7	17 + 20 + 21 + 22
VII	7/8	6 + 11 + 12 + 13 + 14 + 15 + 16 + 18 + 19
VIII	8	23
IX	9	24
X	10	25 + (B-2 + C)
XI	10/11	26 + 27 + 28 + 29 + 30
XII	11	31 - (B-2 + C)

[a] The numbers refer to those production activities defined in National Accounts of Cameroon (see the "List of Production Activities" section below).

of nonprofit services were included in government consumption of domestic consumption; final consumption of domestic services was included in household consumption.[17] In the SAM, final consumption from both services is incorporated in household consumption of private services.

Sectors that could be directly identified as either private or public were kept separate (e.g., groups IV, VI, VIII, X, and XII); otherwise they were combined into aggregate sectors (groups II, V, VII, and XI). These aggregate sectors were then split using relative production shares.

Production Share Factors

Production share factors were calculated for four aggregate sectors: export agriculture (2/4), food industries (5/6), manufacturing industries (7/8), and services (10/11). These are equal to the value of turnover for public-sector enterprises (from the document *Répertoire*) divided by the value of production for the aggregate sector (from the I/O Table). The calculations are as follows (figures are in million CFAF):

[17] These figures can be found in the national accounts.

Export agriculture (2/4):	40,909/569,798 = 0.072
Food industries (5/6):	34,153/305,021 = 0.112
Manufacturing industries (7/8):	188,367/1,613,788 = 0.117
Services (10/11):	244,086/1,591,673 = 0.153

Split in Value-added

A similar procedure was used with employment figures in splitting value-added between private and public sectors. These figures were derived from EBC and from the document *Répertoire* (see the "Factor Account" section). Employment share factors were applied to wage bill figures of the I/O table (as given by the national accounts) while operating surplus was split using production shares. These two variables were finally combined (as total sectoral net value-added) before assembling the factor account. Calculations of employment share factors are the following:

Export agriculture (2/4):	38,113/2,224 = 0.017
Food industries (5/6):	4,697/20,572 = 0.228
Manufacturing industries (7/8):	11,050/59,039 = 0.187
Services (10/11):	172,716/502,166 = 0.344

Split in Depreciation

A more appropriate factor to use in splitting depreciation between sectors should be based on capital stock rather than production. Value of capital stock by sector is obtained by the formula:

$$K_i = k_i \bullet Qi,$$

where k_i is the capital output ratio in sector i. Capital output ratios are derived from Benjamin and Devarajan (1985b, 42). Due to differences in aggregation, these figures need to be related to the 11 sectors of this SAM. The correspondence between the two sectoral breakdowns is as follows:

- for manufacturing industries and services, where our SAM is at first more aggregated, a weighted average of the ratios was calculated using production values as weights;
- for the private/public split, the same ratio was assumed in food industries, manufacturing industries, and services;
- in the agricultural sector, it was assumed that the ratio in the modern sector was twice as large as in the traditional export agriculture sector.

Sectoral capital output ratios and capital stocks[18] are shown in Appendix Table 2. We assumed that the rate of capital depreciation was the same in private and public sectors and split depreciation costs between two sectors the following way:

$$Deprec_I = Deprec_{I+II} \bullet (k_I/k_{I+II}) \bullet (Q_I/Q_{II})$$

When the ratios are the same in both private and public sectors, the second term is 1 and the procedure simplifies to the use of relative production shares. In the case of the combined sector 2/4, however, the second term implies that some adjustment was made for the difference in capital production ratio between the private and public sectors.

Indirect Taxes and Import Taxes

Indirect and import taxes were split using tax rates. We assume that these rates were the same in the private and public sector and calculated the rates that apply to sectors as aggregates. Tax rates in both cases were multiplied by respective values of production to obtain the amount of taxes paid in each sector.

Appendix Table 2 – Capital Output Ratios

Sectors	k	K (mill. CFAF)
[1] Food agriculture	1.5	882,500
[2] Export agriculture	1.3	687,556
[3] Forestry	2.5	417,628
[4] Modern agriculture	2.6	106,363
[5] Private food industries	2.0	577,072
[6] Public food industries	2.0	68,306
[7] Private manufacturing industries	2.5	3,874,283
[8] Public manufacturing industries	2.5	622,990
[9] Construction	2.5	1,259,578
[10] Private services	1.2	2,483,224
[11] Public services	1.2	740,124

[18] $K_i = k_i \bullet Qi.$

Adjustments to Exports

Adjustment for oil exports was made in manufacturing sectors where relative shares of private and public industries differ significantly from those of nonoil exports. It is estimated that 40 percent of oil export revenues go to the Société Nationale des Hydrocarbures (SNH), which is a public enterprise. Thus, using relative production shares (88 percent of aggregate production is private and 12 percent public) to split exports in the manufacturing industry would result in an underestimation of the public-sector share. Oil export revenues (evaluated at 204,666 million CFAF in the national accounts) were subtracted from total exports of the aggregate sector 7/8; nonoil exports were then split proportionally to production shares, while oil exports were split in the proportion of 40:60.

ACCOUNTING IDENTITIES OF THE SAM

Column Identities

[a] Total cost = intermediate consumption + marketing margins + value-added at factor cost + indirect taxes + depreciation

[b] Production = intermediate consumption + value-added at factor cost + indirect taxes + depreciation

[c] Domestic absorption = domestic supply + imports + import duties

[d] Domestic supply = household final demand + government final demand - (imports + import duties)

[e] Value-added at factor cost = factor income = labor value-added + capital value-added

[f] Household expenditures = final demand + direct taxes + savings

[g] Government expenditures = final demand + transfers to households + savings

[h] Total investment = capital formation + variation in stocks

[i] Total exports = exports of goods and services + foreign savings

[j] Foreign savings = trade balance = imports - exports

(continued)

Row Identities

[k] Total uses = domestic output + imports + import duties

[l] Domestic output = intermediate consumption + domestic supply + capital formation + variation in stocks + exports

[m] Domestic sales = household final demand + government final demand

[n] Household income = factor income + transfers (from the government)

[o] Government revenues = indirect taxes + import taxes + direct taxes

[p] Total savings = depreciation + household savings + government savings + foreign savings

[q] Household savings = household income - household expenditures

[r] Government savings = government revenues - government expenditures

[s] Foreign savings = capital account balance = total savings - total investments

DETERMINATION OF EMPLOYMENT CATEGORIES FROM THE EBC

The EBC survey records an employment code number, referring to a title or a type of job (from a code book), and a sector of activity for all working individuals covered. For the purpose of constructing the factor account, only active people were examined--that is, people who were employed during the preceding week, whether at a wage-earning or at a self-employed job. Using the employment code description, the sector of activity, the education level, and the status in the job, every individual was allocated to one of five sectors of activity:

[I] Agriculture,
[II] Food industries,
[III] Manufacturing industries,
[IV] Construction, or
[V] Services;

and assigned one of four employment categories:

[i] Agricultural,
[ii] Unskilled,
[iii] Skilled,
[iv] Highly skilled.

Individuals assigned to employment category i could be allocated only to activity sector I; the three other employment categories could be allocated to any of the five sectors of activities. The two characteristics in combination were used to determine the corresponding number of individuals per labor category and (aggregate) sectors of production in the SAM. Sectoral employment was further broken down into 11 sectors. This required dividing agricultural employment between four sectors and food industries, manufacturing, and services between private- and public-sector employment.

The document *Répertoire* contains figures on the number of employees by categories in public-sector enterprises. Three types of employees are distinguished: workers, trained workers, and managerial staff. They were considered to be of types ii, iii, and iv, respectively. For food industry and manufacturing industry sectors, the data were complete. For services and agriculture, however, other sources of information had to be found in order to compensate for missing data. In the first case, disaggregated data on public administration employment (as part of sector 11, public services) was lacking. The figure on total number of government employees was obtained from the International Monetary Fund document; a breakdown by labor types, however, could not be found. We applied relative shares between categories, calculated from public-service enterprises data (from the *Répertoire*) to government employment.

In the second problematic case, the EBC figure on total employment in agriculture had to be split between four sectors: food agriculture, export agriculture, modern agriculture, and forestry. The three traditional sectors (food agriculture, export agriculture, and forestry) have no breakdown into labor types and therefore only total employment figures were needed. However, in the modern sector, this breakdown exists as it is composed of large public enterprises. Employment by categories in that sector was obtained directly from the *Répertoire*. Note that unskilled labor in the modern sector agriculture is included in category ii, that is, "formal sector unskilled labor." For the forestry sector, the data was obtained from official sources in Cameroon. After subtracting employment in the modern sector agriculture and forestry, we were left with a figure corresponding to employment in both sectors i and ii. This figure was split between export agriculture and food agriculture in proportion to the number of farms in each category as reported in the agricultural census (Government of Cameroon 1987b):

Total number of farms in the traditional sector:	1,155,500
Number of export crop farms with sales:	630,200
Ratio number of export crop farm to total number of farms:	0.55

Thus 55 percent of residual employment was allocated to export agriculture. The final distribution of employment by labor category and by production sector are shown in Appendix Table 3.

Appendix Table 3 - Employment by Factor Category and by Sector

		Agriculture + Informal Unskilled	Formal Unskilled	Skilled	Highly Skilled	Total
[1]	Food agriculture	1,789,117	...	...	...	1,789,117
[2]	Export agriculture	2,186,698	...	...	...	2,186,698
[3]	Forestry	17,860	...	...	...	17,860
[4]	Modern agriculture	...	36,193	1,028	892	38,113
[5]	Private food ind.	...	7,734	8,141	0	15,875
[6]	Public food ind.	...	4,245	272	180	4,697
[7]	Private manufacturing	...	25,199	20,643	2,147	47,989
[8]	Public manufacturing	...	8,622	1,641	787	11,050
[9]	Construction	...	64,395	8,751	1,656	74,802
[10]	Private services	91,571	...	168,137	69,742	329,450
[11]	Public services	...	126,044	24,160	22,512	172,716
	Total	4,085,246	272,432	232,773	97,916	4,688,367

ALLOCATION OF EBC EXPENDITURE ITEMS TO COMMODITY CATEGORIES

Commodity Category	Product Codes[a]
[1] Traditional agricultural products	1, 2, 9-12,14-15, 17-21, 23-26, 30, 37-, 44-46, 57;
[2] Other agricultural products	3, 22, 31-35, 47-48, 54-55, 59;
[3] Forestry	74-75, 80;
[4] Food products	4-8, 13, 16, 27-29, 36, 43, 49-52;
[5] Manufactured goods	53, 56, 58, 60-69, 72-73, 76-79, 82-88, 94-98;
[6] Construction	Imputed rent;[b]
[7] Services	81, 89-93, 99-103.

[a] These codes refer to the first-round aggregation list of products and expenditures selected in the EBC.

[b] Imputed rent is determined for each household, either homeowner or renter. It was allocated to the category construction on the ground that rent and mortgage expenditure finally translates into demand for construction.

DATA AMENDMENT IN THE I/O TABLE

The I/O table used in constructing the SAM was a preliminary version and contained some errors. They were corrected with the best available information and in order to balance the matrix. These amendments are reported here.

1. The sum of intermediate flows of sector 20 exceeded total intermediate consumption (column sum) by 28 million CFAF. This amount was subtracted from the three largest individual intermediate flows according to their share in total intermediate consumption of sector 20:

11 million was subtracted from sector 19 [10,239-11=10,228];
14 million was subtracted from sector 20 [13,193-14=13,179];
3 million was subtracted from sector 29 [2,723-3=2720].

To maintain the row identities, household consumption in these three sectors was increased by equivalent amounts subtracted from total intermediate use (row sum). Household consumption is, by construction, a residual in total use of sectoral production.

2. Total intermediate use (row sum) of sector 2 exceeded the sum of intermediate flows by 2 million CFAF. The total entry was corrected and in order to maintain the row identity, the same amount was subtracted from household consumption.

3. Total intermediate use (row sum) of sector 28 exceeded the sum of intermediate flows by 32,370 million CFAF. The source of this large discrepancy was found to be the result of an inconsistency in the account (see below). So the entry was corrected and household consumption was increased by the same amount to maintain the row identity.

4. The sum of intermediate uses (total of row sums) exceeded the sum of intermediate consumptions (total of column sums) by 32,400 million CFAF. This amount corresponds to what is recorded in the national accounts as "adjustments for financial intermediaries." It refers to the difference between value of production and receipts in sector 28 (financial institutions). This amount was added in the I/O table to total intermediate use of sector 28 but not allocated to individual intermediate flows. After making the three corrections reported above, total intermediate uses equal total intermediate consumption. The adjustments for financial intermediaries, included in total uses of sector 28, were thus transferred to household final demand.

LIST OF PRODUCTION ACTIVITIES IN THE I/O TABLE OF CAMEROON[19]

[1] Agricultural crop production
[2] Agricultural production for industry and exports
[3] Breeding and hunting
[4] Fishing
[5] Forestry and logging
[6] Mining and quarrying
[7] Production of flour and vegetables
[8] Processing of agricultural products
[9] Bakery, pastry, and fancy pastes production
[10] Other food production
[11] Beverage and tobacco production
[12] Textile and apparel production
[13] Shoe and leather industry
[14] Processing of wood and wood products (including furniture manufacture)
[15] Paper and paper goods production, printing, and publishing
[16] Processing of chemicals and chemical products (except rubber)
[17] Rubber and plastic production manufacture
[18] Production of construction materials
[19] Basic metal industries
[20] Fabricated metal products, machinery, and equipment manufacture
[21] Fabricated transport equipment manufacture
[22] Other manufacturing industries
[23] Electricity, gas, and water
[24] Construction
[25] Wholesale and retail trade
[26] Restaurant and hotel trades
[27] Transport, storage, and communication industries
[28] Financial institutions
[29] Real estate and business services
[30] Services
[31] B-1) Public administrations
B-2) Producers of private nonprofit services to households
C) Domestic services of households

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[19] The English names of production sectors come from the National Accounts of Cameroon (1984/85), which are presented both in French and in English.

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