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A 2007 Social Accounting Matrix for Guinea Bissau

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Abstract

In this technical brief, we first present the architecture of the Social Accounting Matrix (SAM) of Guinea Bissau. We then give an overview of the various steps followed during its construction and finally conduct a quantitative analysis of the economy of Guinea Bissau based on a SAM developed for 2007.

Résumé

Dans cette présente note technique, nous présentons d'abord, l'architecture de la Matrice de comptabilité sociale (MCS) de la Guinée-Bissau. Nous donnons ensuite un aperçu sur les différentes étapes suivies lors de sa construction et procédons enfin, à une analyse quantitative de l'économie Bissau-guinéenne basée sur la Matrice de comptabilité sociale (MCS) que nous avons construite pour l'année 2007.

1. The Architecture of the SAM

The Guinea Bissau 2007 SAM comprises 22 sectors and seven factors of production (including three types of land). It has 85 accounts classified into six major groups:

- Factor accounts: The Guinea Bissau SAM includes nine types of factors of production: unskilled labor, skilled labor, agricultural capital, non-agricultural capital, and land. Land can be used for perennial cultivation of cashew nuts, for growing rice, for cattle breeding, or for forestry or other agricultural products. These factors receive revenues which they then transfer to the various institutions;
- Institution accounts: The SAM comprises five categories of institutions: urban households, rural households, firms, governments, and the rest of the world;
- Activities accounts: There are 22 activities (Table 2). In each category of accounts, each activity pays revenues to the factors of production (value added) and purchases the inputs necessary for its process of production (intermediate consumption) from the domestic market;
- The domestic market's product accounts: We have 22 products involving transactions *with* the rest of the world (domestic sales) and *from* the rest of the world (imports);
- Exported product accounts: This account records sales to rest of the world;
- Accumulation accounts: These accounts group households' and firms' savings, the government savings, and the savings of the rest of the world, or the current account balance. These accounts also provide information regarding the amount of gross fixed capital formation (GFCF) and the stock variations of the various sectors of the economy.

Table 1: Grid presentation of Guinea Bissau's SAM Structure for 2007

	Factors	Institutional sectors	Activities	The domestic market	Exports	Accumulation
Factors			Factor returns			
Institutional sectors	Factor returns	Institutional transfers	Taxes on production and subsidies for exports	Imports, indirect taxes on products		
Activities				Domestic sales	Exports	
The domestic market		Private and public final consumption	Inputs			GFCF and variation of stocks
Exports		Exports				
Accumulation		Savings				

Source: Author

Table 2: Sectors of the Social Accounting Matrix

1	Sectors
2	Millet
3	Sorghum
4	Maize
5	Rice
6	Fonio
7	Cotton
8	Other types of agriculture
9	Cashew nut
10	Breeding and hunting
11	Forestry
12	Fishery products
13	Mining industries
14	Food products and beverages
15	Other industries
16	Electricity and water
17	Construction sector
18	Trading and repair
19	Hotels and restaurants
20	Transport and communications
21	Financial services
22	Real estate and services to firms
23	Non-traded services 1

Source: Author

2. Sub-matrix of the Gross Value Added

The sectors account, the production of which is provided by the 2007 input-output table², constitutes the only resource, whereas uses are constituted by intermediate consumption, the taxes related to the net production of the operating subsidies, salaries, and the gross operating surplus (GOS). Based on data from the agricultural services, agriculture (other than cashew nut production) has been disaggregated into seven sub-sectors. The procedure consists of allocating the production from the input-out (I-O) table to the various sub-sectors based on their relative weight on agricultural production. This relative weight has been used to dispatch the revenues among these elements, with the exception of revenue from land. In the agricultural sector and in some sectors in which informal economy has an important weight, the structure of the value-added from the I-O table is marked by high capital intensity which does not match the feature of the

¹ The sector of non-commercial services encompasses the sub-sectors of public administration, education, health, social welfare, and other community services.

² Built by the Bissau Guinean National statistics agency (INEP).

economy. These distortions come from the enforcement of the Extended System of National Accounting (ESNA), which does not enable us to reach pertinent results in terms of factor intensity for agriculture. Adjustments have thus been made to the factor coefficients of the input-output table based on the correction procedure of the factor intensities of the agricultural sector of Senegal, which has a similar economy. If we exclude cashew nuts, a perennial crop, the technologies used in Guinea Bissau's traditional crops are quasi-identical to the crops found in Casamance and the remaining areas of Senegal. These technologies are generally based on rudimentary tools and are highly labor-intensive.

Through our procedure, the value-added structure is adjusted. As the wage account is fed from this source, the capital is deduced from it as a gap. Since the capital is composite, in the case of agriculture, land is extracted based on the reprocessing of the Guinea Bissau 2004 household survey data³. The latter has also been used to adjust the value-added structure in the other sectors of the economy. For the non-agricultural sectors, the adjustment procedure consists of computing the value-added weighted amount (salaries, revenue from property) received by the household depending on its members' fields of activity. The keys obtained from this exercise enable us to recreate more consistently the value-added structure depending on the various sectors of the economy. Once the weight of capital, land, and labor in each sector is determined, we segment the labor market into two components: skilled workers (workers who completed at least six full years of schooling) and unskilled workers (those with less than six full years of school education). This segmentation is based on the household survey. Likewise, since capital mobility is not very likely between the agricultural and non-agricultural sectors, agricultural capital is exclusively confined in the agricultural sectors (apart from fisheries),⁴ while non-agricultural capital is used by the non-agricultural sectors and fisheries.

3. The Input-Output Sub-matrix

The SAM input-output sub-matrix has been filled using data from the 2007 sub-matrix. The sub-matrix includes 19 branches of activity. In the disaggregation procedure of the input-output sub-matrix restricted to the disaggregated sub-branches of the agricultural sector, the data were borrowed from Senegal's intra-agricultural input-output sub-matrix. Considering the quasi-similarity in the agricultural production technologies of Guinea Bissau and neighboring countries like Senegal, the technical coefficients from the data of this country have enabled us to fill in the agricultural intermediate consumption sub-matrix.

³ The latter was the only available household survey conducted at the national level during the construction exercise of the SAM.

⁴ For technical reasons related to the modeling stage, agricultural capital is supposed to be exclusively anchored to the agricultural sectors, which use one specific factor of agriculture: land..

4. Agents Accounts

4.1 Households

Factor revenues allocated to the institutions were distributed from the data drawn from the 2002 Guinea Bissau household survey. The non-agricultural capital is distributed between the firms and the households. We assume that firms receive at least 15% of the revenues of the non-agricultural capital factor, the rest being allocated to the households⁵. The latter fully receive the revenues of two types of labor (skilled and unskilled). Rural households receive the totality of the revenues paid to the various land factor types and to the agricultural capital. The distribution of the factor revenues between the two categories of rural and urban households relies on the structure obtained from survey data.

The equivalent of at least 10% of the non-agricultural sectors operating gross excess is supposed to be distributed to the households in the form of dividends, three quarters of which are received by urban households⁶. The Table of Financial Operations (TFO) provides information about transfers from the government to the households, as well as about the direct taxes paid by households and firms. The balance of payments enables us to capture the transfer received by households from the rest of the world (ROW). Due to a tradition of migration in this country (mainly to Portugal), the weight has been imported from the Senegal SAM.

Regarding employment, the input-output table provides households' final consumption. The direct taxes paid by the households are from the government's financial operation table. The balance of payments also provides information regarding the transfers paid by households to the ROW. Household and firm savings are given by the balance of their account.

4.2 The Government

The input-output table provides all the data on the net taxes and fees collected by the state, whereas the balance of payments provides information on public transfers from the ROW. Regarding employment, the input-output provides information on public final consumption. No transfer was made by the government to the benefit of the rest of the world in 2007.

4.3 The Rest of the World

In terms of resources, the account of the rest of the world is made up of the resources from imports provided by the input-output table and transfers paid by the residents to the rest of the world given by the balance of payments. Regarding employment, we consider the revenues from the exports of goods and services

⁵ By default, we intuitively assume that this ratio is 10 percentage points lower than in the economy of Senegal.

⁶ By default, this ratio is supposed to be 10% less than in the economy of Senegal.

obtained from the input-output table, transfers sent by non-residents, and foreign savings (position of the current balance).

4.4 The Firms

The firms' account is made up of the returns to non-agricultural capital. These revenues are allocated to payment of the dividend paid to households and the direct taxes paid to the state. The balance of the firms' account provides information regarding firms' savings.

5. Consistency between the Sectors of Activities and the Products

In this sub-matrix, we identify 22 sectors of activities and as many products. The final consumption data come from the input-output table. The disaggregation of the agricultural products has necessitated using the household surveys and other data provided by the agricultural statistics. The relative weights obtained from that survey have enabled us to gather the various final consumption of a good sub-matrix while making sure of its consistency with the data obtained from the input-output table.

6. Closure of the SAM

The closure of the SAM has been made through the agents' savings account and stocks changes. The savings accounts and gross fixed capital are used as the clearance account that enables us to absorb the gap between the total of lines and columns.

7. Information Sources

The data used to build this SAM come from several sources:

- The 2007 input-output table from the national statistics office (INEP);
- The 2007 revenues and expenditure table from INEP;
- The 2007 table of financial operations from the Ministry of the Economy and Finance;
- The 2007 balance of payments from the West African States Central Bank (BCEAO); and
- The 2002 household survey from INEP;

8. Lessons from the Guinea Bissau 2007 SAM

8.1 The Macroeconomic Structure

Regarding the value-added distribution between the major groups of sectors, it appears that Guinea Bissau's agriculture represents nearly half of the country's GDP (47%). This is followed by commercialization-based services, which contribute relatively significantly to the GDP.

Table 3: The Total Value-Added Distribution among the Major Sectors (in %)

	SAM (A)	Input-output table (B)	Difference (B)-(A)
Agriculture	47	46	-1
Industry	13	13	0
Tradable services	29	29	0
Non tradable services	11	12	1
Total	100	100	0

Source: Computation from the SAM and the input-output table.

The table below gives us a more detailed representation of the value-added structure in Guinea Bissau. The sectoral distribution of value-added indicate that sectors such as the “trading of vehicle and repair services and goods for household use” (21.6%), the “non-commercial services” (11.3%), “rice” (10.8%), “fishing” (10.2%), and “cashew nuts” (8.5%) are the engine of the economy.

Table 4: Relative Contribution of the Sub-sectors in the Total Added Value

Millet	3.1%
Sorghum	1.9%
Maize	2.8%
Rice	10.8%
Fonio	0.2%
Cotton	1.1%
Other types of agriculture	2.0%
Cashew nut	8.5%
Breeding and hunting	4.3%
Forestry	2.2%
Fishery products	10.2%
Mining industries	0.0%
Food products and beverages	9.1%
Other industries	1.3%
Electricity and water	0.3%
Construction sector	2.3%
Trading and repair	21.6%
Hotels and restaurants	1.1%
Transport and communications	4.0%
Financial services	0.5%
Real estate and services to firms	1.5%
Non-traded services ⁷	11.3%
TOTAL	100%

Source: Computation from the SAM.

⁷ The sector of non-commercial services encompasses the sub-sectors of public administration, education, health, social welfare, and other community services.

The examination of the production factors indicates that agriculture redistributes the largest share of its production in the form of factor revenues to households (nearly 85%). On the other hand, the “food and beverage industries”, the “other industries”, the “water and electricity” branch, and the “transports and communications services” are high input consumption sectors and consequently provide relatively little value-added.

Table 5: Sectoral Intensity in Value-Added

	Value added/Production
Agriculture	84.9%
Industry	49.4%
Tradable Services	66.9%
Non-Tradable Services	63.0%
Millet	95.7%
Sorghum	95.7%
Maize	96.3%
Rice	90.0%
Fonio	96.0%
Cotton	49.3%
Other types of agriculture	70.5%
Cashew nut	82.5%
Breeding and hunting	91.5%
Forestry	76.2%
Fishery products	83.3%
Mining industries	82.6%
Food products and beverages	48.1%
Other industries	47.2%
Electricity and water	40.3%
Construction sector	59.3%
Trading and repair	78.6%
Hotels and restaurants	55.9%
Transport and communications	39.3%
Financial services	58.3%
Real estate and services to firms	61.2%
Non-traded services ⁸	63.0%

Source: Computation from the SAM.

Analysis of the factor intensity of the various sectors shows that agriculture is a relatively unskilled labor sector. As for industry and the non-tradable services, they use relatively more capital. Unlike the traditional agriculture sub-sectors, the branches of industry are relatively very highly capital-intensive.

⁸ The sector of non-commercial services encompasses the sub-sectors of public administration, education, health, social welfare, and other community services.

Table 6: Factor Intensity of the Various Sectors of the Economy

	Unskilled labor	Skilled labor	Non-agricultural capital	Agricultural capital	Land type (Tag)	Land type (Tri)	Land type (Tac)	Land type (Tliv)	Land type (Tfor)	Total
Agriculture	26%	25%	0%	44%	2%	1%	1%	0%	0%	100%
Industry	11%	13%	76%	0%	0%	0%	0%	0%	0%	100%
Tradable services	15%	28%	56%	0%	0%	0%	0%	0%	0%	100%
Non-tradable services	12%	42%	46%	0%	0%	0%	0%	0%	0%	100%
Millet	29%	27%	0%	34%	10%	0%	0%	0%	0%	100%
Sorghum	29%	28%	0%	34%	9%	0%	0%	0%	0%	100%
Maize	29%	28%	0%	35%	9%	0%	0%	0%	0%	100%
Rice	30%	28%	0%	35%	0%	6%	0%	0%	0%	100%
Fonio	27%	26%	0%	32%	15%	0%	0%	0%	0%	100%
Cotton	30%	28%	0%	35%	7%	0%	0%	0%	0%	100%
Other types of agriculture	29%	27%	0%	34%	10%	0%	0%	0%	0%	100%
Cashew nut	47%	45%	0%	3%	0%	0%	4%	0%	0%	100%
Breeding and hunting	15%	14%	0%	67%	0%	0%	5%	5%	0%	100%
Forestry	29%	27%	0%	44%	0%	0%	0%	0%	5%	100%
Fishery products	5%	5%	91%	0%	0%	0%	0%	0%	0%	100%
Mining industries	60%	37%	3%	0%	0%	0%	0%	0%	0%	100%
Food products and beverages	12%	8%	80%	0%	0%	0%	0%	0%	0%	100%
Other industries	4%	16%	80%	0%	0%	0%	0%	0%	0%	100%
Electricity and water	4%	16%	80%	0%	0%	0%	0%	0%	0%	100%
Construction sector	8%	32%	60%	0%	0%	0%	0%	0%	0%	100%
Trading and repair	14%	30%	56%	0%	0%	0%	0%	0%	0%	100%
Hotels and restaurants	19%	25%	56%	0%	0%	0%	0%	0%	0%	100%
Transport and communications	18%	23%	59%	0%	0%	0%	0%	0%	0%	100%
Financial services	4%	40%	56%	0%	0%	0%	0%	0%	0%	100%
Real estate and services to firms	31%	13%	56%	0%	0%	0%	0%	0%	0%	100%
Non tradable services ⁹	12%	42%	46%	0%	0%	0%	0%	0%	0%	100%

Source: Computation from the SAM.

Legend: Tag: land for other agricultural products; Triz: land for rice; Tac: land for cashew nuts; Tliv: land for livestock; Tfor: land for forestry.

⁹ The sector of non-commercial services encompasses the sub-sectors of public administration, education, health, social welfare, and other community services.

The table below describes the structure of the consumption and investment demand. Household consumption represents 95% of the country's GDP. The investment rate is equal to 16%. Households and the rest of the world are the main agents providing savings. Public consumption represents around 17% of the GDP. Total intermediate demand represents the equivalent of nearly 41% of the GDP.

Table 7: Relative Weight of the Absorption Components (in % of the GDP), 2007

	SAM (A) (CFAF Billions)		Macro data (B) (CFAF Billions)		Difference (B)-(A)
Final consumption	312.796	95,47%	350.754	106%	10%
Investment	55.029	16,79%	42.937	13%	-4%
Public expenditure	58.589	17,88%	68.477	21%	3%
Total Intermediary demand	137.434	41,94%	125.073	38%	-4%

Source: Computation from the SAM.

8.2 Public Finance

Analysis of the government's revenue structure shows that it is essentially dependent on transfers received from the rest of the world. These transfers represent nearly 68% of the government's revenues. These revenues are also dependent on the rights of entry into the territory (15%), followed by taxes on income and wealth (11%).

Table 8: Sources of the State's Revenues and Expenditure, 2007

Revenues	
Duties and taxes on revenues and wealth	11%
Production-related duties and taxes	3%
Received operating subsidies	-1%
Customs duties	15%
VAT	3%
Received transfers	68%
Total	100%
Expenditure	
Transfers paid	1%
Public consumption	93%
Savings	6%
Total	100%

Source: Computation from the SAM.

8.3 Structure of the Household Expenditure and Revenues

Table 9 gives us the distribution of households' sources of revenues. Remuneration of the non-agricultural capital and skilled labor represents, respectively, nearly 46% and 32% of the total revenue of urban households. For rural households, non-agricultural capital and unskilled labor have a relatively more important weight in total revenue.

Table 9: Structure of Households' Revenues, 2005

	LNQ	LQ	NAGCAP	AGCAP	Tag	Triz	Tac	Tliv	Tfor	Enterprises	Gov't	Rest of the world	Total
Urban	8.5	32.0	46.1	0.0	0.0	0.0	0.0	0.0	0.0	5.4	0.1	7.8	100%
Rural	29.6	17.1	17.4	23.5	2.1	1.4	0.8	0.4	0.2	2.9	0.3	4.2	100%

Source: Computation from the SAM

Legend: LNQ: unskilled labor; LQ: skilled labor; NAGCAP: non-agricultural capital; AGCAP: agricultural capital; Tag: land for other agricultural products; Triz: land for rice; Tac: land for cashew nuts; Tliv: land for livestock; Tfor: land for forestry.

The structure of the consumption expenditure is marked by the predominance of agro-food products. The latter burdens the consumption basket of rural households. In addition to agro-industrial goods, industrial products also occupy a significant share in the consumption expenditure in urban settings. The weight of tradable services is relatively higher in urban households.

Table 10: Structure of the Households' Expenditure, 2007

Households	Urban	Rural
Direct taxes	1.8%	0.3%
Paid transfers	1.0%	0.2%
Savings	13.0%	0.4%
Consumption		
Agriculture	39.5%	65.3%
Industry	38.1%	31.7%
Tradable services	6.6%	2.0%
Non-tradable services		
Total	100%	100%
Direct taxes	1.8%	0.3%
Transfers paid	1.0%	0.2%
Savings	13.0%	0.4%
Millet	2.4%	5.6%
Sorghum	1.4%	3.4%
Maize	2.2%	5.1%
Rice	11.4%	17.2%
Fonio	0.2%	0.4%
Cotton	0.8%	2.0%
Other types of agriculture	0.8%	5.7%
Cashew nut	0.0%	0.0%
Breeding and hunting	2.8%	5.4%
Forestry	1.4%	3.3%
Fishery products	16.0%	17.4%
Mining industries	0.0%	0.0%
Food products and beverages	30.1%	24.3%
Other industries	7.8%	7.4%
Electricity and water	0.2%	0.1%
Construction sector	0.0%	0.0%
Trading and repair	0.0%	0.0%
Hotels and restaurants	0.3%	0.2%
Transport and communications	3.1%	1.0%
Financial services	0.3%	0.0%
Real estate and services to firms	2.9%	0.8%
Non-traded services ¹⁰	0.0%	0.0%
Total	100%	100%

Source: Computation from the SAM.

8.4 Foreign Trade

The economy of Guinea Bissau is strongly dependent on the rest of the world for its domestic market procurement. The analysis of its foreign trade shows that imports at CIF price represent nearly 37% of the

¹⁰ The sector of non-commercial services encompasses the sub-sectors of public administration, education, health, social welfare, and other community services.

GDP, whereas exports estimated at FOB price constitute only about 12% of the GDP. Investment in the economy of Guinea Bissau is funded, in part, thanks to an important contribution from the rest of the world. Foreign savings (deficit of the balance of ordinary operations) represents 7% of the GDP.

Table 10: Foreign Trade Balance (in percentage of the GDP), 2005

Exports	12%
Imports	37%
Net Transfers	18%
Ordinary balance	7%

Source: Computation from the SAM.

9. Conclusion

The Guinea Bissau 2007 SAM has been built based on several important data: the input-output table built by INEP, revenues and expenditure table obtained from INEP, a table of financial operations given by the Ministry of the Economy and Finance, the balance of payments obtained from the West African States Central Bank, and the household survey done by INEP. The SAM has 85 accounts and includes 22 sectors, seven factors of production, and three types of land. Several lessons can be drawn from the analysis of the economy of Guinea Bissau based on the 2007 SAM:

- The country's GDP essentially comes from agriculture, which contributes nearly half. However, at the sectoral level, "vehicle trading and repair services and trading of household use goods", "non-commercial services", "rice", "fishing", and "cashew nuts" all have a relatively important contribution to GDP;
- The economy of Guinea Bissau is highly dependent on the rest of the world, as indicated by the relatively important weight of the foreign transfers received as well as the weight of imports in the GDP;
- Public finance is very highly dependent on transfers from the rest of the world and on revenues from indirect taxation. The government's revenue is essentially affected by public consumption; and
- Non-agricultural capital and skilled labor have a relatively more important weight in the structure of the urban residents' revenue than in that of rural residents. In rural areas, unskilled labor and agricultural capital are dominant. The consumption basket of this category of households is dominated by the agro-food products, whereas the basket of urban households is marked by a strong predominance of industrial goods.

References

PROJET SISA, 2008. “Rapport de mission d’assistance technique : Analyse des données de l’enquête agricole 2007/2008.” Bruxelles: AEDES.

DSEA, 2008. “Données agricoles, Direccao De Servico De Estatisticas Agricolas.” Bissau.

Ministério Da Economia, 2007. “Orçamento Geral Do Estado Para o Ano 2007.” Mimeo Bissau.

INEP, 2007. “Tableau entrées-sorties.” Mimeo. Bissau.

INEP, 2007. “Enquête ménage.” Mimeo. Bissau.

BCEAO, 2007. “Balance des paiements.” Dakar, Senegal.

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