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Lessons Learnt from Three Social Accounting Matrices

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Introduction

Sudan is an Afro-Arab country of multi-ethnic, multi-cultural and multi-lingual society. It enjoys a remarkable strategic location in the center of the African continent that marks a melding point between Arabs and sub-Saharan peoples. The country shares extensive boarders with nine countries of Northern, Central, Eastern and Western Africa. Such juxtaposition engenders a mix of trade, culture, social, ethnic and other human ties built through history.

The country enjoys a total area of 2.5 million km^2, the largest in Africa. It extends from the hot arid North to West tropics in the South with diversified ecosystems that provide immense fertile land of about 80 million hectares (about 20% of this land space is cultivated), natural pastures of about 24 million hectares, forest area of about 64 million hectares and the remaining land is desert or semi-desert. Considerable water resources is available from the River Nile and its tributaries, seasonal streams and rains with annual amount of 109 billion m^3 of water in addition to the underground water underlay the Nubian Sand-Stone Aquifer which is one of the largest water reservoirs in the world of estimated potential rechargeable 29 billion m^3 of water. Sudan also enjoys a long coastal line at the Red Sea (MFNE[1], 2006).

Sudan has boasted the largest farm in the world in the Gezira irrigated Cotton scheme, and the world's largest sugar-producing complex in the Kenana project. It was also until recently the biggest producer of Gum Arabic in the world (Ahmed and Newton, 2005).

As a typical developing country, the Sudanese economy is dominated by the agricultural sector as indicated by the share it contributes to the GDP. The average agricultural GDP in the last ten years was 45.1 % of the total GDP. But in the year 2006 it was 38% having fallen from 47.7 % in 1997 and 49.8 % in 1999. Despite the decline in its contribution to the total GDP, the sector's GDP value has been in an increase implying that the sector is not deteriorating but other sectors are growing. For instance the share of the industrial sector in total GDP grew from 15.1 % in 1997 to 28 % in 2006. Similarly, the share of service sector increased from the last ten years average of 33% to 34% (figure 1). In the past, agriculture was found to be the largest contributor to the GDP in Sudan. For instance, at time of Sudan independence in 1956, agriculture accounted about 60% of total GDP, whereas industry accounted for 5% and services about 35% (Mustafa, 2006).

The objective of this paper is to study the changes happened to the Sudanese economy during the years 2001, 2002, and 2003 as important years witnessed the evolution of the economy after the extraction of oil, signing the comprehensive peace agreement (CPA) with SPLM[2] in southern

[1] Ministry of Finance and National Economy, Sudan
[2] Sudan Peaople's liberalization Movement

Sudan and the sizable flows of foreign investments. More specifically this paper is based on three aggregated social accounting matrices (SAM) for the same years consist of same sectors and at the same level of aggregation. The monetary flows in these SAMs will be used to study the structure of the economy in each year on one hand, and on the other hand to compare these flows across the three-year period to know the general trends those economic sectors were following.

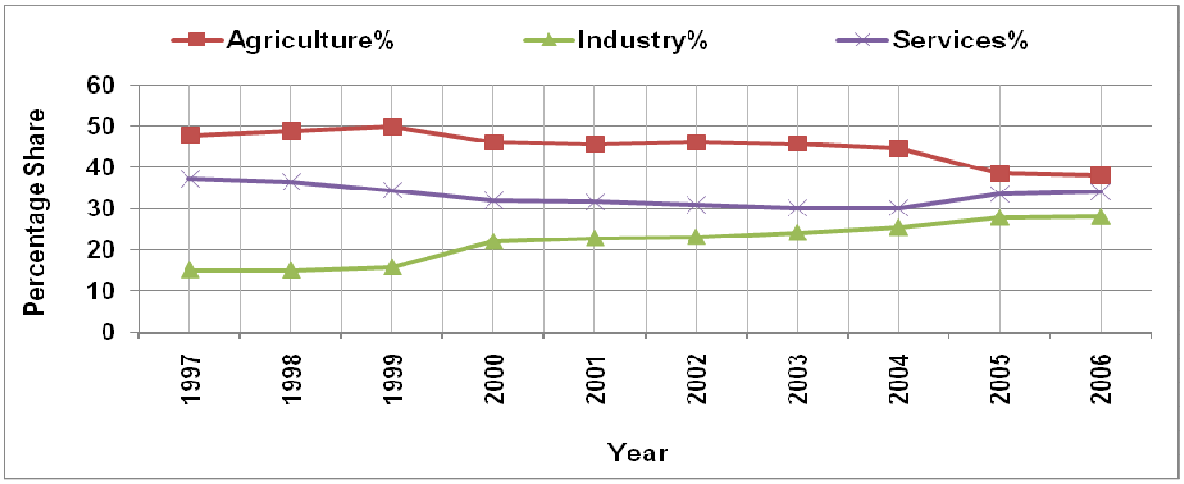

Figure 1: the contribution of the economy sectors to the GDP (1997- 2006)

Materials and Methods

A social accounting matrix (SAM) is a square matrix consisting of row and column accounts that represent the different sectors, agents, and institutions of an economy at the desired level of disaggregation. By convention, each account in the SAM is represented by one row and one column of the table and each cell represents an expenditure by the column account and an income to the row account. The underlying principle of double-entry accounting requires that total revenue (row total) must equal total expenditure (column total) for each account in the SAM. A SAM is a useful framework for preparing consistent, multi-sectoral, economic data that integrates national income, input-output, flow-of-funds, and foreign trade statistics into a comprehensive and consistent dataset. Once a SAM for a particular year is constructed, it provides a static image, or a snapshot, of a country's economic structure.

In the case of this paper, the SAMs comprises ten accounts on line and ten accounts in column: the account of the activities, the account of the commodities, factors of production, Household, Government, Firms (companies), Tariffs, Non-tax revenue, Capital account, and the account of the Rest of the World (RoW). Table1 draws up the structure of our SAM of Sudan.

Table1. The structure of the Sudan's Social Accounting Matrix

	Activities	Commodities	Factors	Households	Government	Tariffs	Non-Tax	Firms	Capital	Rest of the World	Total Expenditure
Activities		Domestic sales									**Total domestic production**
Commodities	Intermediate Consumption	Marketing Margins		Household Consumption	Government consumption				Investment demand	Exports	**Total domestic demand**
Factors	Added value									Factor Income from Abroad	**Total revenue of labor and capital**
Households			Labour and capital income		Transfers			Transfers		Transfers from Abroad	**Household Income**
Government	Indirect Taxes		Taxes on profits	Direct taxes			Non-tax revenue	Corporate taxes		Transfers from Abroad	**Government Income**
Tariffs		Tariffs									**Total Tariffs**
Non-Tax					Nontax revenue						**Total non-tax revenue**
Firms			Non disrupted profit	Transfers	Transfers					Transfers from Abroad	**Firms income**
Capital Account				Household savings	GOV saving			Firm saving		Savings of the ROW	**Total savings**
Rest of the World		Imports	Factor payments	Transfers	Transfers			Current transfer abroad	Net lending		**Foreign exchange payments**
Total Income	**Total costs of production**	**Domestic supply**	**Factor outlay**	**Total Household expenditure**	**Total GOV expenditure**	**Total Tariffs**	**Non-tax Revenue**	**Total Firm expenditure**	**Total Investment**	**Foreign exchange earning**	

The data used to construct the SAMs include national accounts statistics, government budget data, and trade data collected from the official sources in Sudan during the second half of the year 2006 such as the Central Bureau of Statistics (CBS), the Central Bank of Sudan (CBOF), Ministry of Agriculture, Ministry of Finance and National Economy (MFNE), and other related institutions.

Results and Discussion

Fifteen economic indicators have been selected out of the three SAMs to serve the purpose of this paper, ordered according to its values of the year 2001, and put in three groups (A,B, and C) to ease the graphical representation of these indicators and the comparison of its three years values as shown in figure2.

A	B	C
Domestic Sales	Imports value	Tariffs
Household Income	Export value	Household Saving
Value Added	Government Expenditure	Direct Taxes
Household Consumption	Total Foreign Saving	Government Saving
Intermediate Consumption	Transfer to HHs from the RoW	Factors Income from abroad

Figure2. The fifteen economic indicators groups ordered according to the 2001 values.

As stated above the criteria of organizing the indicators in the three groups is only their values, this mean that indicators in group (A) have higher values than that in group (B) and that of (B) have higher values than group (C).

Group (A):

Figure3 shows a graphical representation of group (A) comparing the three SAMs values for each indicator.

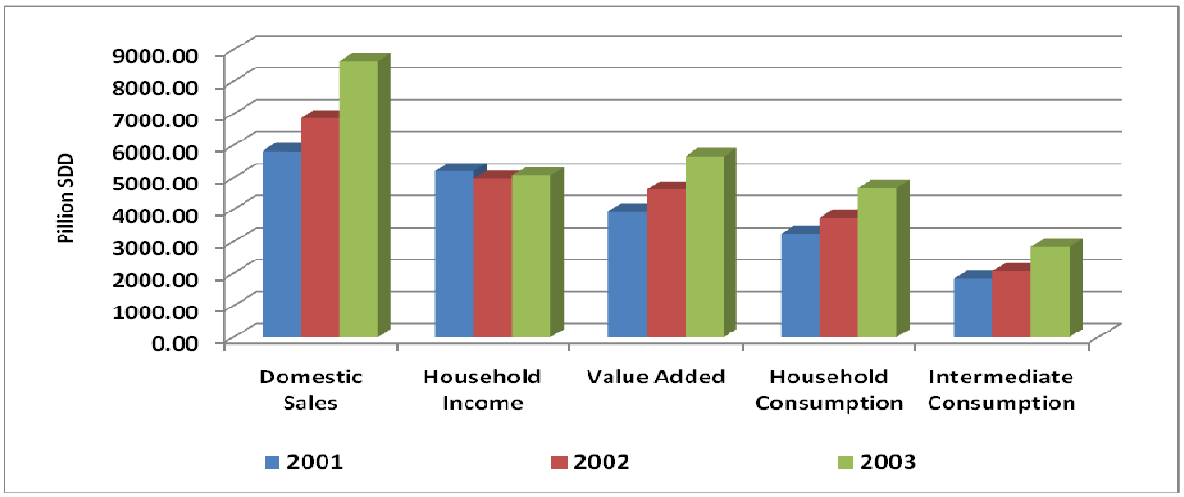

Figure3. Group (A) indicators in the years 2001, 2002, and 2003.

All indicators in this group are showing a growing trend through the three years period with about 16% in 2002 and 23% in 2003, except the household income which witnessed 4.5% decline in 2002 and a very small increment of 1.97% in 2003, which means that its value in 2001 is greater than that of 2003. This is due to the deterioration in the transfers from the government to households with 84% and the transfers from firms to households with 96% in 2002; no significant change happened to these transfers in 2003, but the transfers from the rest of the world to households has increased with about 11%.

Group (B):

As shown in figure4 imports and exports values improved with about 29% and 21.5% in 2002 and with 17% and 25% in 2003 respectively, the imports value's growth rate is less in 2003 because the tariffs improved with 21.6% in the same year, while it was reduced with 9% in 2002.

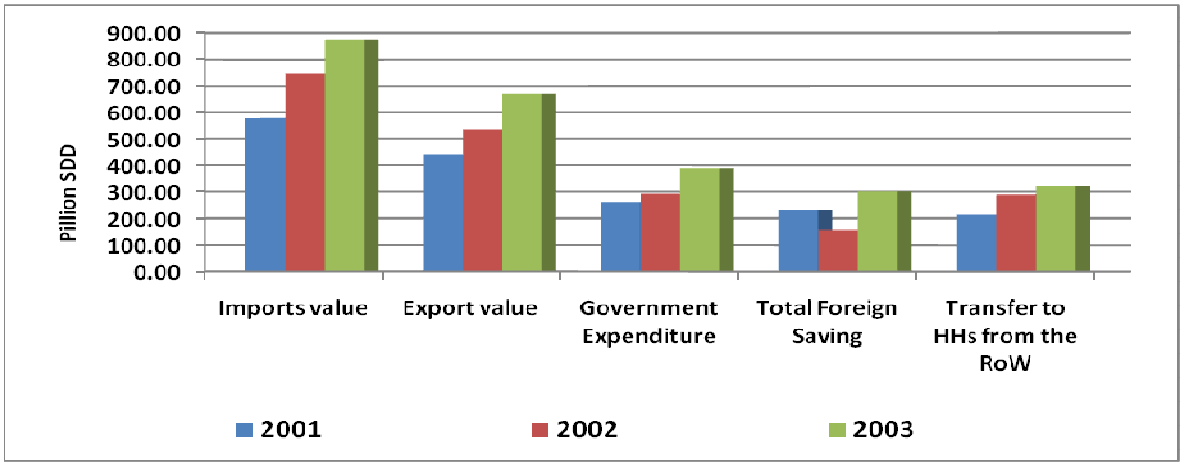

Figure4. Group (B) indicators in the years 2001, 2002, and 2003.

The total foreign savings declined with about 31.5% in 2002, but in the same year the total foreign exchange earning increased with 33%, while in 2003 the foreign savings increased with 90%, but the total foreign exchange earnings improved only with 7%, which means that the foreign saving is not significantly affecting the foreign exchange earnings.

Group (C):

This group consists of the lower values members, but it includes also the strangest behavior compared to A and B. The year 2002 had the highest values for household saving, government savings, and factors income from abroad, which increased with 753.6%, 1145%, and 2244.8% respectively from its values of 2001, the only one justification could be the quality of data, because the increment in this year was very high while also the deterioration in 2003 is also 48%, 87%, and 97.5% respectively.

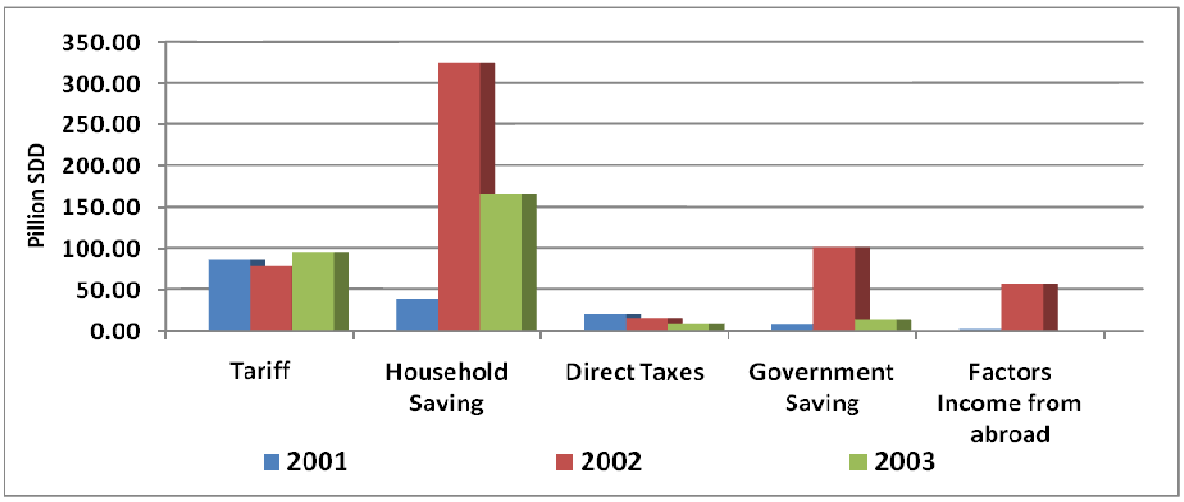

Figure5. Group (C) indicators in the years 2001, 2002, and 2003.

Direct taxes which represent income taxes on households showed significant deterioration of about 23% and 41.7% in 2002 and 2003 respectively. This could be explained on the bases that

the government taxes reduction is related to the improvement in the total government income, especially after the role of oil as an important source of hard currency.

Conclusions

This paper seek lessons from the aggregated versions of three SAMs for Sudan (Macro-SAMs) with ten sectors. Secondary data from the official relevant institutions in Sudan was used. In most cases the general trends of the SAMs cells is that, it was improving conforming the overall growth of the economy, except some strange cases due to other economic events and shocks. The quality of data found also to be a cause of strange behaviors of some indicators.

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