



يونيكونز للاستشارات المحدودة

Toward An Equitable Inter-Governmental Transfer System for the Sudan¹

Ibrahim A. Elbadawi

Development Economic Research
Group World Bank, Washington DC
email: ielbadawi@worldbank.org

Kabbashi Suliman

Department of Economics
University of Khartoum
email: kmsuliman1@yahoo.co.uk

This version: May 2007

¹ This paper is written for Unicons Consultancy Ltd and the FFAMC, Khartoum. Sudan. It is to be presented at the workshop entitled "Fiscal Federalism in Sudan" (20th June, 2007) that is being jointly organized by Unicons and the FFAMC and sponsored by the World Bank.

Executive Summary

This paper develops a framework for determining the quantum of the required vertical transfers of public funds from the federal government to the northern state governments. Lack of data prevented application of the proposed formula for the case of the transfers from the Government of South Sudan to the southern states. The proposed formula espoused the objectives of fiscal efficiency and equity by explicitly accounting for “needs” and own revenue mobilization “potential” of the states as the key determinants of these transfers.

The review of the federal transfers in Sudan showed that, over the last few years, the vertical transfers to the northern states have precipitously risen consistent with the expanding fiscal responsibilities assigned to these states. As shares to aggregate central revenues, these transfers increased from an average of about 5.5 percent between the fiscal years 1993/4 and 2004 to 29.9 percent in the following year when the CPA was signed. However, the share of total state expenditure covered by the states’ own recourses (i.e. one minus the share covered by federal transfers) declined from an average of more than 80 percent between 1993/4 and 2004 to less than 40 percent for 2005. Therefore, the significant rise of the share of federal transfers to the states in 2005 has been associated with widening “vertical fiscal imbalances”.

An assessment of the grant allocation system, based on the proposed formula using FY 2005 figures, suggests that the aggregate vertical transfers had barely met states’ needs, given their own revenue mobilization potentials. Moreover, the implementation of the system was not found to be consistent with the declared objectives of horizontal equity across states. For example, ranking states by population density, share of rural population and share of children in the age group 0-14, we fail to find systematic relationship between the transfers per capita and any of the three factors. Based on the NSSF own allocation criteria, we expect states with higher rural population, larger share of dependent children, or lower population density to receive more transfers. However, the data suggests that NSSF was not following systematic criteria. If any thing, it had in several cases violated these criteria. Thus, should have the proposed formula been properly implemented, the emerging architecture of the transfers will have been radically different from the actual in 2005. For example, per capita transfers relative to the total would have, respectively, been 8 and 4 percent for the Northern and Nahr Annil, compared to the 13 and 12 percent in actual transfers in 2005. On the other hand, Red Sea and W. Darfur would have, respectively received 7 and 8 percent, compared to their actual transfers of 1 and 2 percent.

The present structure of grants transfers is also not explicitly related to the real cost of the public services. Costs of the same level of service may vary between and within states due to remoteness, lack of accessibility and variation in demand. The impact of this should be measured or estimated, for example, by constructing a cost index reflecting cost variations of key state and local governments’ goods and services. Further adjustments to such an index, in order to reward performance, could be made especially in connection with realizing a given MDG.

Anticipating the envisaged significant expansion of states’ fiscal mandate to come in FY 2008, an “optimum” level of aggregate fiscal transfers to the northern states is estimated at a mean value of SDD 600 billion (in 2005 fixed prices), which would be about four times the vertical transfers for FY 2005. However, while the formula should anchor the determination of the volume and the distribution of the inter-governmental transfers, a range of estimates should be considered around the mean value, to allow (at the margin) for other legitimate considerations that may not be accounted for by the formula.

Although the framework underlying the analysis of the paper appears to us good enough, in the longer-run, fiscal decentralization should be underpinned by more nuanced and, therefore, unavoidably, more sophisticated analytical framework. This would require that the FFAMC- the key federal body tasked with this enormous responsibility- should quickly develop into a capable and technically sophisticated institution of public policy. The FFAMC should have enough institutional savvy and policy experience, so that it is able to contextualize its

analytical conclusions into implementable policy recommendations that would provide a range of choices and consequences to policy makers. This is necessary because, even with a good data base and a well developed formula, there will be legitimate differences on concepts and techniques regarding fundamental issues, such as what indicators of “need” and “fiscal capacity” should be selected

Finally, the FFAMC cannot ignore the political context under which it had to operate. Therefore, it should not refrain from playing an active advocacy role for promoting knowledge and drawing lessons from other countries about the political requirements for successful fiscal decentralization as well as the consequences of the latter for the political process in the country. Two things need to be made explicit in this context. First, horizontal economic disparities within national states are a fact of life, but efficient and equitable public policy can be, and have been, successfully deployed in order to address them. On the other hand, large and inequitable regional fiscal disparities can be politically divisive and have been linked to civil wars and political unrest. Second, the grant equalization literature often emphasizes the importance of political tolerance, cohesion, participation and democracy as necessary prerequisites for successful application of such transfers.

I. Background

1. The objective of this paper is to develop a framework for thinking through the construction of an equitable and transparent operational formula for determining the quantum of the required vertical transfers of public funds from the federal government to the northern state governments. These transfers should be both adequate and equitable in order to permit the states (collectively and individually) fulfil their public expenditure mandates, given their potential capacities of own resource mobilization. The same framework could later be replicated for the vertical transfers from the GOSS to the southern state governments. The proposed framework will be one of several tools at the disposal of the Fiscal and Financial Allocation and Monitoring Commission (FFAMC), the lead federal agency in charge of implementing fiscal decentralization in Sudan. The FFAMC was created as part of the Comprehensive Peace Agreement (CPA) in 2005 and its role has been further strengthened and clarified in the subsequent Darfur and East Peace Agreements, (DPA) and (EPA), respectively.

2. Though transfer of resources between different levels of government had a long history in Sudan. Only recently that equalization-- i.e. streamlining the differences in the states' revenue capability-- has been stated as an explicit objective of such transfers, however. One of the guiding principles in the Wealth Sharing Protocol WSP (2004) is that, the national wealth shall be shared equitably between different levels of government so as to allow enough resources for each level of government to exercise its constitutional competencies. The WSP makes reference to the development of comprehensive equalization criteria to be used in allocating intergovernmental grants. Section 6 of the WSP Agreement detailed the revenue assignments of the federal Government and the states Governments, and section 8 outlined the factors that need to be considered in the equalization grants. These factors include: population; minimum expenditure responsibilities; human development index – social indicators; geographical areas; fiscal effort; and the effect of war factor.

3. The equalization objective of the envisioned intergovernmental transfers was subsequently formally enshrined in the Interim National Constitution Article 198 (2), as, "that equalization grants from the National Revenue Fund (NRF) are promptly transferred to respective levels of government"². At least in theory, equalization grants are aimed at ensuring that the state governments have adequate resources to provide reasonably "comparable" levels of public services at reasonably "comparable" levels of taxation. Equalization grants in this sense provide one of those rare instances in public economics where equity and efficiency considerations coincide³.

4. Federal transfers are critical for the ability of, at least some if not all, states to fulfil their public expenditure mandate without resorting to socially and economically undesirable, and eventually unsustainable, taxation practices. First, the taxable capacity (usually measured by the size of the tax base) differs across states. Since the geographical distribution of resources, and hence tax bases, is not uniform in any country, states tend to have different fiscal capacity. A 'poorer' state, i.e. with a smaller (per capita) tax base will raise less revenue at a given tax rate than a 'richer' one. Second, the per-unit costs of providing public services varies across states and therefore, to provide a "standardized" level of services may require greater expenditures and higher tax rates in high-cost state. Differences in per-unit costs may arise for climatic or geographic reasons, density or distance reasons, or differences in factor cost across states. Third, the needs for public services vary across states due to differences in the number of units of standardized service required per capita. This may arise owing to demographic factors such as age or differences in participation rates in social programs, e.g. a growing school-age population will require greater expenditures on

² Although the INC and CPA identify equalization as an objective but uncertainty exists on the extent to which equality should be attained and whether equalization should be based on access to services, funding or some other measures (see Fox (2006).

³ See Shah (1994) and Wilson (2003) for a discussion.

education, while older population will require relatively greater expenditures on health care and social services.

5. In principle two major questions need to be addressed by any intergovernmental transfer scheme: how are ‘standard’ fiscal capacities determined; and, how are “standard” expenditures determined? We provide a brief overview of the key issues provoked by these two questions in Appendix I. However, given the acute data limitation for the Sudanese states, we adopt a simple formula: $EG = GEB - ER$, where GEB is gross expenditure base and ER is eligible revenues. The GEB is a measure of expenditure needs and the eligible revenues ER are a measure of the revenue-raising capacity of the states. A version of this summary formula was proposed by Bird (1983) for Colombia, and El Shibly (1983) discussed its relevance for Sudan.

6. Section II discusses the proposed vertical intergovernmental transfers’ formula. Section III provides a brief overview of the recent experience of Sudan and assesses the consistency of the practice with the vision in the conduct of fiscal decentralization during the last three to four years. As an input to the budget of FY 2008, section IV contains an application of the proposed formula to estimate the “optimum” quantum of the aggregate vertical transfers from the federal government to the 16 northern states⁴. These calculations will be based on “best practice” tax rates and expenditure per capita assumptions consistent with the fiscal mandates of state governments in Sudan. Section V concludes with the way forward.

II. The Proposed Vertical Inter-Governmental Transfer System

7. Intergovernmental transfer usually concerns with the determination of the size of the overall divisible pool⁵, i.e. vertical transfer and with the distribution of this pool across the recipient sub-national governments, that is, the horizontal transfer. International experiences with intergovernmental transfers vary. First, with respect to the total vertical transfers, the size of the divisible pool may be determined in several ways. It may be set annually as part of the normal budgetary process, as in many developing countries including Sudan; determined as a given proportion of central revenues (as in Argentina); or on the basis of central collections of one or more particular taxes (as in Australia, Germany); as well as it may be paid out of general central revenues but with the amount paid determined by a formula driven by other factors such as the level of the sub-national governments’ fiscal means and expenditure needs as in Canada. Second regarding the second aspect of the transfer schemes, the amount to be distributed to different sub-national governments may be determined on the basis of expenditure differentials and/or fiscal capacity and perhaps also fiscal effort, or it may simply fill budget gaps, as in some countries of the former Soviet Union and Eastern Europe (Dafflon and Vaillancourt, 2003).

8. As noted in section I above, we would propose a formula, based on the application of “standard” level of services and “standard” tax rates across all states. One articulation of this concept, which is least demanding in terms of data is given by equation (1) below for the aggregate vertical equalization grant for state i ⁶:

$$(1) \quad EG_i = e_s N_i - t_s Y_i$$

⁴ Transfers to the Government of Southern Sudan were determined in bulk by the CPA, and the GoSS then determines the shares of the ten southern states.

⁵ Not all the assigned share of the northern states in the federal budget is available for distribution according to the equalization formula. For example based on 2006 budget, 69 per cent of the states’ share was already assigned for specific purposes (see Srivastava and Kaiser 2006 Box 1). Ideally the vertical transfers, the pool, as well as the horizontal distribution should follow the equalization rule.

⁶ Such equalization formula measures the difference between “comparable” expenditures (or services) and “standard” revenues in order to ensure that each states can provide “standard” levels of public services at “comparable” levels of taxation (see Appendix I).

Where, EG_i is the “equalizing” grants to state i , N_i is the total size of the population of state i , Y_i is level of personal income in state i , t_s is the uniform “standard” state tax rate and e_s is the “standard” per capita expenditure that the state must spend in order to fulfil its mandate in the context of the federal system. Note that the tax rate and the expenditure per capita are assumed to be the same for all states. This allocation formula, in principle, allows the states to provide a “standard” level of services by levying a “standard” tax rate. Ideally, we should account for state differences in terms of cost of service delivery and tax institutions, as these should not be assumed to be the same across all states. However, this would require detailed information on tax bases, tax revenues for every state as well as data on need differences, i.e. differences in the required number of per capita units of standardized service as well as the cost of providing those services must be taken into account. As noted above grant allocation formulae are data intensive, and given the current data limitation in Sudan an explicit set of minimum national standards of revenue and public service could be established and used in the equalization schemes until a further refined alternative could be furnished from more detailed data.

9. The proposed formula is based on a bottom-up approach that determines equitable transfers state by state, leading to the aggregate pool by simply summing up the computed EG_i 's for all the states considered (in this case the 16 northern states). That is, the formula could be used in allocating the divisible pool as well as in determining the overall size of this pool based on expenditure needs and tax capacity at the state level. The data requirements of this formula are minimal as we only need information of four variables: population and income level in each state (N_i and Y_i , respectively) and estimation/assumptions about the “standard” expenditure and tax rates (e_i and t_i , respectively). However, there is no data on income per capita at the state level in Sudan, therefore, it must be estimated econometrically. Drawing from the received literature on fiscal decentralization, we use adapted estimates from a well specified regression based on Canadian states data to predict the level of personal income state by state as a linear logarithmic function of the rate of urbanization, since we have data on urbanization rates at state level (see appendix II). Now, assuming that we have reasonable estimates of personal income for each state, equation 1 allows computing the “equalization” transfer for state i . And, the aggregate vertical transfers for the 16 states are simply given by:

$$(2) EG = \sum_{i=1}^{16} EG_i$$

The Equity and Efficiency Implications of the proposed Formula:

10. Before we apply the above formula in the next two sections, we would like to briefly discuss its likely economic as well as political implications and, hence, its relevance for Sudan. Equation 1 makes clear that, the proposed formula will (on average) ensure that:

- As far as public policy is concerned, all Sudanese citizens should be entitled to the same level of basic public services (education, health, water ...etc) regardless of where they live⁷ (equal expenditure per capita)
- State tax revenues are assessed on “potential” (depending upon the level of personal disposal income) rather than “actual” –de facto-basis, which promotes resource mobilization at the state level and reduces too much dependency on the centre
- However, the equalization of tax rates across states (or at least the requirement that they remain within a federally set range) will ensure that local tax rates must meet certain standards of fairness and are consistent with other national economic objectives, such as export promotion

⁷ However, there are other geographic and historical factors that also affect the quality of social services that are beyond the scope of public policy, at least in the short to medium runs.

- Finally, the dependence of income level on the rate of urbanization (see Appendix II) suggests that more urbanized states will be required to raise more taxes and hence they should receive less net transfers from the centre, compared to states with relatively larger rural economies—this feature of the allocation formula is desirable on both efficiency and equity grounds.

11. In terms of efficiency, the received literature suggests that urbanization is a very important determinant of spatial income disparities in a national economy (i.e. income differences in a given national economy across states, counties ...etc.) Therefore, urbanized states are likely to be more capable in generating tax revenues, without resorting to excessive measures that might have negative consequences for economic efficiency. The recent experiences of the 16 Northern Sudanese states seem to corroborate this view, with state revenue mobilization capacity strongly associated with the rate of urbanization (Figure 1). Even when controlling for other factors that might be associated with revenue mobilization, the effect of urbanization remains statistically significant (see Appendix III). Therefore, the Sudan is not an exception to the globally accepted empirical regularity regarding the central role of urbanization as a determinant of local state revenue capacity.

12. The principles that underlie the proposed formula are not only consistent with efficiency but they also promote equity along horizontal lines. Though vertical equity is also very problematic in Sudan and, therefore, a strong national commitment is required for reducing inter-personal (or inter-household) poverty and income inequality; horizontal inter-state inequities are, however, a major contributor to vertical inequality and has been linked to conflicts and a growing sense of political and economic marginalization on the part of the poorer regions of the country. Therefore, by ensuring that public resources for funding basic social services are equitably and transparently distributed among all states, the proposed formula (or a variation based on it) should go along way toward contributing to the agenda of peace and equity in the country. It goes without saying that promoting peace and democratic transition is an extremely worthwhile public good that entails huge positive externalities. Moreover, in turn, peace and democracy are usually associated with improved accountability and transparency and, hence, better management of public funds by governments. Therefore, the proposed formula for federal grants should also be augmented with further special federal grants/projects for promoting overall development in poorer regions as well as introducing legal and institutions measures for ensuring that the benefits (e.g. employment, newly developed agricultural lands, infrastructural and mineral projects ...etc.) of federally-funded projects in all the country be made accessible to all citizens with the right qualifications.

III. An Overview of Intergovernmental Transfers in the Sudan

13. The vertical transfers to the 16 northern states have precipitously risen over the last few years, consistent with the expanding fiscal responsibilities assigned to these states. As shares to aggregate central revenues, these transfers increased from about 5.3 percent in 2000 to more than 16 percent in 2005. Moreover, the 2006 budget projects the total vertical shares to increase to more than 28 percent of aggregate revenues. This significant expansion in the federal transfers has been underpinned by equally significant increases in the overall size of the public sector, with federal revenues and expenditure growing from 12.4 and 13.4 in 2000 to projected 23.4 and 28.6 percent of GDP on 2006⁸. Therefore, given the expanding public pie, the mean per capita transfers almost doubled from SDD 2373 in 2003 to SDD 4580 in 2005⁹. (Table 1 provides state by state data on own revenues, federal transfers, VAT collection as well as population for 2003-2005.)

14. Also, and since 1993, the federal grant allocation system has undergone various changes, aimed at better targeting fiscal abilities and needs of the states. However, as we will show below, much remains to be done. The states revenue sources consist of the following: (i) grants and transfers from the federal budget through the National State Support Fund (NSSF); (ii) shared revenues, including transfers of 45 percent of VAT collection, 2 percent

⁸ Estimates due to Srivastava and Kaiser (2006).

⁹ Based on NSSF data.

of petroleum revenue by derivation, and 10 percent of public enterprise profits; (iii) loans and borrowing (in accordance with the Constitution); and (iv) revenues collected directly by the states through taxes, fees, and user charges.

15. The allocation of funds to the states through the NSSF is based on a formula that includes the following factors: financial performance; population density; availability of natural resources; human resources expertise; adequacy of available infrastructure; education level; availability of health services; security situation; and average per capita income. Each factor receives 10 per cent weight except the financial performance which receives 20 per cent. Although the NSSF spelled out the individual factors that need to be considered in the allocation, the measurement of some of these factors leaves much room for discretion. For example, it is not clear how the availability of natural resources, the security situation and the state per capita income are determined. In other comparator countries the bulk of the transfer grant is divided into equal share as in Nigeria or that fifty per cent of the grant is distributed in equal share and the balance is allocated in concordance to some measurable socio-economic indicators as in Malawi.

16. The percentage shares of federal transfers to federal revenues have grown modestly over time until 2005, when it experienced a spectacular jump from 8.2 percent in 2004 to 29.9 percent in the following year when the CPA was signed. The share of total state expenditure covered by the states' own recourses (i.e. one minus the share covered by federal transfers) declined from an average of more than 80 percent for 1993-2004 to less than 40 percent for 2005 (Table 3). Therefore, the significant rise of the share of federal transfers to the states in 2005 has been associated with widening "vertical fiscal imbalances"¹⁰, which will be the trend for the post-CPA fiscal decentralization regime.

17. The calculated coefficient of fiscal vertical imbalance suggests that the ability of the states to finance their current expenditures from their own sources of revenues has shown a decline from 92 per cent in 1994/5 to about 38 in 2005. There is a discernable increasing trend in fiscal vertical imbalances. This result is also confirmed by columns (3) and (4) in the table, as seen, while the ratio of states' expenditure to the total expending is increasing, the ratio of federal transfers to total federal revenues remains virtually the same. Interestingly, over the review period, the states' shares of current expenditures have shown an increasing trend, yet the measure of vertical balance showed a decline. This apparent paradox may be due to the small size of the federal grant in the states own revenues. It seems, the states were assigned more responsibilities without correspondingly increasing transfers¹¹.

¹⁰ "Vertical fiscal imbalance" refers to the difference between expenditures and revenues at different levels of government, and "horizontal fiscal imbalance" refers to the differences between revenue and expenditure levels within a particular level of government. One approach for measuring vertical imbalance, suitable for our context, is the "coefficient of vertical fiscal imbalance" (due to Hunter, 1977). Three values could be calculated in terms of this coefficient depending on the definition of the independent revenue source at the state level. In the first, only the state's own revenues are taken; while the second also includes shared taxes; and the third includes both shared taxes and unconditional grants in addition to own revenues. Although this coefficient is easy to measure its comparison across different countries is problematic, because it is difficult to judge the degree of independence of various sources of revenue in different countries (see Martinez-Vazquez and Boex 2002). Another method for measuring vertical imbalances is based on the surplus or deficit position of the states, as sub-national units, before borrowing but after all revenue-sharing and transfers have been implemented. Observed relatively largest deficit indicate that the expenditure needs in a given state have not been met appropriately. However, this measure requires the rather strong assumption that all states provide the services under their responsibility in an efficient manner, and that both the Federal and the State Governments face the same borrowing constraint. We employ Hunter coefficient to measure the vertical fiscal imbalance in Sudan by taking only the ratio of federal transfers to the total states expenditure; the result is shown in column (5) of Table (1).

¹¹ This observation is in line with the "flying paper" effect: that is money stuck where it lands first. Rao and Singh (1998) found similar trends of vertical fiscal imbalance for India. However, in explaining such paradoxical pattern for India, they observed that there was an increasing tendency to divert capital receipts at the state level to meet current expenditures, as the states do not have much manoeuvrability with regard to capital receipts, this indicates increasing vertical imbalance. And that there was an increase in matching transfers which further eroded the states' control over expenditure decisions.

18. It should be noted that the presence of vertical fiscal imbalance can not be taken by itself as evidence for more federal transfers. As noted above, these transfers should be governed, at least in principle, by actual expenditure needs relative to the ability to raise revenues in order to safeguard against expenditure profligacy and fiscal irresponsibility. In this context there are two major issues to be considered. First, the extent to which actual transfers vary by the characteristics of the states; that is, do states with greater fiscal needs and/or less able to raise revenue receive proportionately larger grant? Second, have the overall quantum of vertical inter-governmental transfers been consistent with the fiscal responsibilities assigned to the states, given own resource mobilization capabilities.

We turn next to these issues.

Assessing the System: How far from the Vision?

19. Though overall federal transfers were increasing over time, their allocation across the states, however, did not seem to reflect adherence to any systematic criteria. For example, ranking states by population density, share of rural population and share of children in the age group 0-14, we fail to find systematic relationship between the transfers per capita and any of the three factors (Figures 2.A-C). Based on the NSSF own allocation criteria, we expect states with higher rural population, larger share of dependent children, or lower population density to receive more transfers. However, the data suggests that NSSF was not following systematic criteria. If any thing, it had in several cases violated these criteria.

20. Probing deeper into this issue, we next apply the proposed formula of equations 1 and 2 to further assess the current grant allocation system in the context of the above questions. Using these two equations, we derive the levels of the required federal grant transfers state by state for 2005, based on the following assumptions:

- Expenditure needs (e_s) at the state level is given by the average share of the economic and social services in the federal budget for 1993/4-2005, which is equal to 23.9 per cent (could be taken as a representative national average)
- Fiscal capacity (t_s), for the reasons mentioned earlier, could be proxied by the average ratio of the internal VAT to own revenues--the average tax rate in this sense is 11.4 per cent for the 16 northern states in year 2005
- The population size and the urbanization rate at the state level are taken from the population projections for the same year
- A range of estimates for the parameter “b” is readily available in appendix II, and parameter “a” was calculated using equation 17 of the appendix¹².

21. Table (4) provides the main indicators for year 2005 used in this calculation. The per capita expenditure in column (5) was determined assuming that the states were allowed to claim and spend themselves the 23.9 % share of the economic and social services in the federal budget for year 2005. A preliminary message from this basic table is that the collection of the VAT, which is a broad commodity-based tax, was highly skewed. Khartoum and Red Sea states collect much of this key tax over 2003-2005. Furthermore actual federal per capita allocation for year 2005, as an example, does not appear to allow for the population or state size and/or the relative rate of urbanization, these indicators are crucial in many equalization systems.

22. Table 5 presents the results of the application of the proposed federal allocation formula based on the above assumptions and the indicators of table (4) for year 2005. The table suggests that, should have the vision been properly implemented, the emerging architecture of

¹² Because the share of the 16 states, considered in the calculation, in the GDP is not available, we used the ‘disposable’ GDP for year 2005 as well as the national urbanization rate for the calculation of the constant a in the formula.

the transfers will have been radically different from the actual in 2005. For example, per capita transfers relative to the total would have, respectively, been 8 and 4 percent for the Northern and Nahr Alnil, compared to the 13 and 12 percent in actual transfers in 2005. On the other hand, Red Sea and W. Darfur would have, respectively received 7 and 8 percent, compared to their actual transfers of 1 and 2 percent. The larger story on how far the practice from the vision had been is also conveyed in Figures 3 and 4.

Assessing the System: How Adequate?

23. The above assessment is not strictly within the terms of reference for this paper, as there is another paper dedicated to the issues of “horizontal transfers”. However, due to the structure of the proposed formula, assessment of the horizontal dimensions of the system is a natural prelude to asking the fundamental question from the perspective of the “vertical transfers”: was the aggregate quantum of these transfers adequate, given the assumed fiscal responsibilities and own revenue mobilization potential of the states. We compare the aggregate federal grants actually allocated in 2005 to three estimates: one that assigns high income impact for urbanization, and therefore predicts higher own revenue mobilization potential and lower required federal transfers; a medium income impact that predicts medium transfers; and a low income impact that predicts high transfers (Figure 5). The actual transfers in 2005 are very close to the “optimum” low-case scenario, both being close to SDD150 billion. However, the medium and, especially, the high case scenarios are much higher—estimated at close to SDD 200 and SDD 300 billion, respectively.

24. To conclude, our assessment of the federal grant allocation system suggests that it has not been equitable. Moreover, our conclusion on this regard is robust to a wide range of scenarios regarding state own revenue mobilization capacity. Moreover, our assessment is also in agreement with another more detailed study, using an entirely different methodology (Bell and Ahmed, 2005). As for the adequacy of aggregate vertical transfers, our assessment depends on the income elasticity of urbanization. However, given the fact that the process of urbanization, especially the phenomenal expansion of greater Khartoum State, is more a reflection of the economic decline of the rural sector than a dynamic structural transformation toward a more complex and higher productivity economy, it is probably prudent to assume a medium to low elasticity. Under such more plausible assumptions, the vertical transfers are clearly well below optimum levels.

IV. Thinking Ahead: Optimum Vertical Transfers for FY 2008

25. The proposed transfer formula (of equations 1 and 2) could be used to estimate aggregate vertical transfers for the 2008 budget, that are consistent with the optimality criteria (of equity and efficiency) embodied in the proposed system. Moreover, though there may be more nuanced criteria for horizontal allocation within the states, our calculations could also inform this budget exercise as well (see Tables 6 and 7). Such calculation would be based, for the time being, on some historical measures of national average revenue capacity and expenditure needs at the state level as well as on the best practice in comparator countries. Ultimately, in the longer run when enough data is available, sensible representative expenditure system (RES) that incorporates measures of cost and need requires disaggregated expenditures into major functional categories such as health services, education, transportation and communication, etc. Then regression analysis can be used to determine the influence on spending levels of cost and need indicators so identified¹³.

Some Key Assumptions:

26. Subscribing to the above, we apply the proposed formula using the average national tax rate and the share of spending on education and health in total expenditure at the sub-national level for some lead reforming African countries.

¹³ An example of such calculation was provided by Martinez-Vazquez and Boex (1997), who evaluate alternative measures of fiscal capacity for the Russian Federation.

- Tax rates: the average tax rate for these countries comes to about 15 percent

For comparison, we note that the average national tax rate in Sudan over 1970-2002, as determined from the main tax handles, was about 33 percent. Such high rate, however, tends to encourage tax evasion and avoidance¹⁴. In our view, given the already high prevailing national tax rate, states should not levy additional rates on the same tax base; instead, the current national tax base should be divided up between the two levels of governments. It should also be noted that high tax rate by itself may not generate high revenues. Tax compliance, the level of granted tax exemptions and the degree of enforcement of tax law, that is, the fiscal effort are equally important in determining actual revenue collection¹⁵.

- Expenditure needs per capita: given the recently expanded fiscal mandate of the states, which now includes, in addition to basic education and health, security, higher education and the judicial system, we assume that, on average, 39 per cent of recurrent spending will be needed for the states to meet their fiscal responsibilities

Again there is no one single norm to follow, in fact the main challenge in fiscal decentralization has to do with finding the right balance between central and sub-national government responsibilities that ensures efficient service delivery. In this context, the experiences of the other African countries vary. For example the provinces in South Africa spent about 90 per cent of their recurrent expenditures on services¹⁶. Malawi local governments spent on average about 21 per cent on education and primary health care over 1997-2001 (Boex et al 2001). The recent budget review in Sudan for six pilot states revealed that the bulk of states' spending goes for wages and salaries, with capital spending claiming a meagre share of 5 to 10 per cent.

- Disposable income, population and urbanization rates: maintain their current growth level through year 2008.

Simulations:

27. Three estimates for federal allocation-- based on the importance of urbanization as a determinant of inter-state income levels and, hence, their own resource mobilization capacity, were presented in table (6). The table suggests that the net transfers per capita should be inversely related to the urban elasticity of income. However, the differences in the estimated net transfers across the three scenarios are much more dramatic in the less urbanized states. For example, the per capita transfers for Northern are estimated at about SDD 5600; 10,000; and 20,000 for high, medium and low urbanization effects, respectively. And, for the even less urbanized state of W. Darfur, the estimates are SDD 6000; 12,000; and 24,000. On the other hand, the corresponding estimates for Khartoum state would come to SDD 2700; 2800; and 2900. However, once we account for the VAT reimbursement the consolidated aggregate transfers for the more urbanized states (Red Sea, Gezira and, especially, Khartoum) will significantly rise (Figure 6). This evidence, should, perhaps, provide a justification for the current practice of making no or little transfers and/or reducing the share of VAT reimbursements to these highly urbanized states.

28. The "optimum" inter-state grant allocations, in terms of total rather than per capita transfers, reflect the fundamental primacy of population size as a determinant of the overall size of the vertical transfers as well as its horizontal allocation across states. This is a simple consequence of the application of the equity principle at the per capita level. Table 7 and Figure 7 convey this feature in terms of the absolute as well the relative transfers. It is not surprising, therefore, that the bulk of the absolute transfers should go to the populous states of Khartoum, Gezira, S. Darfur and W. Darfur as well as the (new) N. Kordofan (integrated with

¹⁴ See Suliman (2005)

¹⁵ Fiscal effort is defined as the degree to which a state utilizes the revenue bases at its disposal, and is generally measured as the ratio of the state tax collect relative to some measure of fiscal capacity.

¹⁶ See, <http://www.statssa.gov.za/>.

W. Kordofan); while the least populated states (Northern, Nahr elNil, Red Sea, B. Nile) would each be receiving only 1 percent. Finally, the aggregate vertical transfers, consistent with the envisioned, and significantly expended, state fiscal mandate to come in FY 2008, is estimated at SDD 416; 570; and 823 billion (Figure 8), depending on the assumed effect of urbanization on income. We would recommend, therefore, a suitable range around SDD 600 billion be considered as a reasonable estimate for the required aggregate vertical transfers.

V. The Way Forward

29. The current version of the proposed formula constitutes the minimum required analytical framework for operationalizing a meaningful “representative expenditure system: RES” that, would hopefully, meet acceptable standards of fiscal efficiency and economic and social equity. While, in our view, this formula is good enough, given the acute data limitations in Sudan, especially at the state level; in the longer-run, fiscal decentralization should be underpinned by more nuanced and, therefore, unavoidably, more sophisticated analytical framework. However, the fundamental principles of coherence and simplicity of the underlined concept behind the formula should be maintained. The received literature suggests the following data and analytical measures, required for the evolution of the formula-based inter-governmental fiscal transfers into a fully-fledged RER system¹⁷:

1. Disaggregate the state expenditures into major functional categories such as health services, education, transportation and communication, etc.
2. Determine the influence on spending levels of cost and need indicators such as those listed above through regression analysis. This step is critical and difficult, requiring thorough understanding of not only the differences in service areas, populations and local needs but also of the objectives of public policy and the production functions (input-output relationships) of public services.
3. Establish the per capita standardized expenditure of each state for each category, employing national average values for the fiscal capacity indicators. What this procedure does is to establish how much the state would spend, given its needs and costs profile, for each specific expenditure category if it had ‘average’ revenue. Since the weight of each factor was obtained empirically through regression analysis using data on all regions, in principle this method, therefore, has the advantage of meeting objective standards.
4. Estimate the standardized per capita national expenditure for each category by evaluating the regression results at national mean values for all variables.

30. The above agenda is clearly very challenging but indispensable. This would require that the FFAMC- the key federal body tasked with this enormous responsibility- should quickly develop into a capable and technically sophisticated institution of public policy. The FFAMC would not only need to develop its own analytical and statistical competencies but it should also spearhead a significant rebuilding of national and state capacities on data collection, monitoring, analysis ...etc. Indeed, the availability of adequate and accurate (or at least believable) national and sub-national socio-economic and other data is critical for the ability of the FFAMC to fulfil its mandate. Moreover, the Commission should have enough institutional savvy and policy experience, so that it is able to contextualize its analytical conclusions into implementable policy recommendations that would provide a range of choices and consequences to policy makers. This is necessary because, even with a good data base and a well developed formula, there will be legitimate differences on concepts and techniques regarding fundamental issues, such as what indicators of “need” and “fiscal capacity” should be selected. Therefore, while the formula should anchor the determination of the volume and the distribution of the inter-governmental transfers, a range of estimates

¹⁷ See, for example, Shah (1996).

should be presented, however. This would, at the margin, allow for other legitimate considerations that may not be accounted for by the formula.

31. The present structure of grants transfers is not closely related to expenditure needs and to the real cost of the public services. Costs of the same level of service may vary between states and between localities within the state due to remoteness, lack of accessibility and variation in demand. The impact of this should be measured or estimated, for example, by constructing a cost index reflecting cost variations of key state and local governments' goods and services¹⁸. This exercise could start by reviewing the present state/localities' expenditure composition of key sectors, e.g. education, health, utilities, administration etc. Second, a standard cost (typically average cost) of a given service, e.g. expenditure per child in the primary school for the average provider state/locality could be established. Third, the expenditure needs on key services could, for example, be: $N_i = \text{measurement units} * \text{average per unit costs} * \text{adjustment index} * \text{performance index}$. Where i stands for expenditure within sector e.g. education, measurement units is the number of units e.g. number of children in the primary school age, the average per unit cost refers to the national per capita expenditure on primary education, the adjustment index may be the ratio of students from poor families in the state/locality compared to the national average, or the ratio of children with special needs etc. and the performance index could be determined sector wise taking into account the realization of a given MDG. Similar proposals were made in the Commission recommendations (2003) for Uganda.

32. Finally, the Commission cannot ignore the political context under which it had to operate. Therefore, it should not refrain from playing an active advocacy role for promoting knowledge and drawing lessons from other countries about the political requirements for successful fiscal decentralization as well as the consequences of the latter for the political process in the country. Two things need to be made explicit in this context. First, horizontal economic disparities within national states are a fact of life, but efficient and equitable public policy can be, and have been, successfully deployed in order to address them. On the other hand, large and inequitable regional fiscal disparities can be politically divisive and have been linked to civil wars and political unrest¹⁹. Second, the grant equalization literature often emphasizes the importance of political tolerance, cohesion, participation and democracy as necessary prerequisites for successful application of such transfers.

Conclusion and Policy implications

33. The main objective of this paper was to develop a framework for determining the quantum of the required vertical transfers of public funds from the federal government to the northern state governments. The developed framework was less data intensive given the current lack of systematic information at the state level. However, it operationalizes a meaningful "representative expenditure system: RES" that, would hopefully, meet acceptable standards of fiscal efficiency and economic and social equity. While, in our view, the formula based on such analytical framework is good enough, in the longer-run, fiscal decentralization should be underpinned by more nuanced and, therefore, unavoidably, more sophisticated analytical framework.

34. The results of the analysis in this paper revealed two main conclusions: first, the share of federal transfers to the aggregate central revenues increased from an average of about 5.5 per cent over the FY 1993/4 and FY 2004 to 29.9 per cent in FY 2005, however, the share of total states' expenditure covered by the states' own resources (i.e. one minus the share covered by federal transfers) declined from an average of more than 80 per cent between 1993/4 and 2004 to less than 40 per cent for 2005 implying that the significant rise of the share

¹⁸ Shah (1994) noted that, expenditure needs could be defined as the cost of supplying average performance level for existing mix of federal-state-local governments' programmes without applying subjective standards such as "minimum, reasonable or ideal service level.

¹⁹ See, for example, Shankar and Shah (2003).

of federal transfers to the states in 2005 has been associated with widening “vertical fiscal imbalances”. Second, the appraisal of the grant allocation system, based on the proposed formula using FY 2005 figures, revealed that, though, the overall federal transfers were increased particularly in 2005, their allocation across the states, however, did not seem to reflect adherence to any systematic criteria. For example, ranking states by population density, share of rural population and share of children in the age group 0-14, we failed to find systematic relationship between the transfers per capita and any of the three factors. This suggests, if any thing, that the NSSF had in several cases violated these criteria. Thus, should have the proposed formula been properly implemented, the emerging architecture of the transfers will have been radically different from the actual in 2005. For example, per capita transfers relative to the total would have, respectively, been 8 and 4 percent for the Northern and Nahr Alnil, compared to the 13 and 12 percent in actual transfers in 2005. On the other hand, Red Sea and W. Darfur would have, respectively received 7 and 8 percent, compared to their actual transfers of 1 and 2 percent.

35. The present structure of grants transfers is also not closely related to the real cost of the public services. The impact of cost variations between and within states should be measured or estimated, for example, by constructing a cost index reflecting cost variations of key state and local governments’ goods and services. Further adjustments to such an index, in order to reward performance, could be made especially in connection with realizing a given MDG.

36. In the light of the proposed transfer formula, we estimate for FY 2008 an “optimum” level of aggregate fiscal transfers to the northern states at a mean value of SDD 600 billion (in 2005 fixed prices), which would be about four times the vertical transfers for 2005. However, while the formula should anchor the determination of the volume and the distribution of the inter-governmental transfers, a range of estimates should be considered around the mean value, to allow (at the margin) for other legitimate considerations that may not be accounted for by the formula. In the longer-run, fiscal decentralization should, unavoidably be supported by more sophisticated analytical framework. This would require that the FFAMC- the key federal body tasked with this enormous responsibility- should quickly develop into a capable and technically sophisticated institution of public policy. The FFAMC should have enough institutional savvy and policy experience, so that it is able to contextualize its analytical conclusions into implementable policy recommendations that would provide a range of choices and consequences to policy makers. This is necessary because, even with a good data base and a well developed formula, there will be legitimate differences on concepts and techniques regarding fundamental issues, such as what indicators of “need” and “fiscal capacity” should be selected.

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Appendix I: Approaches for Measuring “Standard” Revenues and “Standard” Expenditures

In the case that the objective of the equalization grants (EG) is to attain vertical fiscal balance, i.e. to “level the playing field”²⁰. Then (EG) needs to be measured as the difference between “comparable” expenditures (or services) and “standard” revenues in order to ensure that each states can provide “standard” levels of public services at “comparable” levels of taxation; thus the EG formula can be generally expressed as;

$$EG=SE-ST$$

(1)

Where, EG is equalization grant, SE is “standard” expenditures and ST is “standard” revenues. The main challenge with this general formula is how to define the “comparable” expenditures and revenues and how they should be measured.

Standard revenues

The general practice in measuring the standard revenue is to multiply a “comparable” tax rate by the observed tax base for a variety of tax sources. The “average” tax rate is often used as a proxy for the “comparable” tax rate, therefore, a representative tax system (RTS) may be written as;

$$ST=t_j*B_j$$

(2)

Where t_j is “standard” or average tax rate for revenue source j , B_j is the tax base for revenue source j . The taxable capacity is calculated for each revenue source j and then summed over all sources to obtain “comparable” revenues. This formula does not measure “standard” revenue ability, which in turn, requires appropriate information on tax base and that all states are equally able to exploit all their ‘assigned’ potential tax bases freely –a matter that is not always easy to determine in practice. However, though this formula is data intensive, it is superior to other approaches that employ macroeconomic indicators or simply use past revenue records to allocate the EG²¹.

Standard Expenditures

The expenditure side of the formula is less obvious. Generally three ways were in use to measure expenditure need (see Martinez-Vazquez and Boex, 2001). The first method is to calculate the cost of providing a standardized set of public services. This requires the determination of what services are to be included and what ‘standards’ are to be met. Furthermore, both the price of inputs and the factors affecting the scope of the services need to be known. A second method relies on historical expenditure patterns and use observed average costs for various expenditures. The problems with this approach are that, past observed expenditures on particular activities may not reflect current policy objectives. In addition expenditures that seem the same in the data may in fact be quite different. A third approach is to use the representative expenditure system (RES). This method is similar to the representative tax approach (RTS) on the revenue side. A simple version of the (RES) -- that also incorporate a RTS-- could be expressed as;

²⁰ A vertical equalization schemes require the central government to claim a larger share of tax room than its expenditures might require, which itself could raise important political issues, although at the same time it may facilitate the harmonization of taxes and internalize fiscal externalities, (see Boadway, 2004).

²¹ See Vaillancourt and Bird (2005)

$$\text{EG} = p_i(E/\text{POP})_i * w\text{POP}_i - t_j * B_j \quad (1/c)$$

(3)

Where (E/POP) is the “standard” or average per capita expenditure for service category i, POP is the population applicable to service category i, p is input price (cost) differential, w is the weighting factor for service category i and c is the cost-of-living differential.

Thus, this formula compensates for differences in fiscal capacity, needs, and costs. However, these equalization factors are actually incorporated in a few selected equalizations schemes around the world. Vaillancourt and Bird (2005) reviewed the equalization schemes of selected countries including Australia, China, Brazil, Switzerland, Germany, and India, which represent wide spectrum of equalization systems. Three main conclusions emerged from their review: first, the theoretical logic of equalization does not appear to have had much impact on actual equalization. Second, only Australia, of the countries they considered appears to have adopted the apparently most logical RES approach to equalizing expenditure. Third, many countries seem to take equalization into account in a variety of ‘case-specific’ ways such as special allowances for particular regions. These conclusions appear to give support to Lösch (1954)’s classical argument that the mere existence of regional economic disparities does not signal a state of “spatial” disequilibrium. May be the best policy-- to correct for spatial disequilibrium normatively defined-- is to use “situation specific” assistance for the disadvantaged region. Even in this case one would say grants allocation needs to take into consideration expenditure needs and fiscal capacity in order not to impair the work of competitive markets²².

The territorial grant financing in Canada is of particular interest to our case. At the federal-provincial equalization, only revenues are included in the formula, under the assumption that expenditure needs per capita are identical across provinces and the distribution of expenditure needs is based on the distribution of population (Bird and Slack, 1990: 919). However, at the territorial level, both the revenue means and expenditure needs were represented in the EG formula, which can be expressed in general terms as;

$$\text{EG} = \text{GEB} - \text{ER}$$

(4)

Where, GEB is gross expenditure base and ER is eligible revenues. The GEB is a measure of expenditure needs and the eligible revenues ER are a measure of the revenue-raising capacity of the territories. Generally, this grant formula includes both expenditure needs and fiscal capacity and is similar to equation (1)²³. A version of this summary formula was proposed by Bird (1983) for Colombia; and El Shibly (1983) discussed its relevance for Sudan. We follow the general practice and use an allocation criterion based on this formula to determine the federal transfers to the states.

Appendix II: A Formula for Intergovernmental Fiscal Transfers

We start by the formula in equation (2) of El Shibly (1983)’s thesis:

$$(1) \quad T_i = e_s N_i - t_s Y_i$$

Where, T_i is the transfers to state i, N_i is the total size of the population of state i, Y_i is level of personal income in state i. And,

²² Vaillancourt and Bird (2005) pointed that the differences resulting from the free mobility of resources within the countries, if so wished, may be compensated in various less visible ways, for example, by differences in social capital (family ties, community support) access to ‘free’ natural resources (fishing, hunting, better climate) and the value of fixed assets (paid-up ancestral houses).

²³ See Slack (2005) for a discussion of the actual variables used in the computation of this formula for territorial financing in Canada.

(2) e_s = the per capita expenditure that the state must spend in order to fulfil its mandate in the context of the Federal system. This is the amount that we need to estimate, utilizing the best practice in other African and developing countries; we also estimate a range of values: maximum (e_s^{Max}); mean (e_s^{mean}); and minimum (e_s^{min})

(3) t_s = the state tax rate (as opposed to the federal/GOSS tax rate) that would be assessed as reasonable, because while one would like to promote the state capacity to raise own resources, one would not like states to impose exorbitant taxes, especially on economic activities with high social returns, such as key exports or those critical for equity and the fight against poverty. This is the amount that we need to estimate, again utilizing the best practice in other African and developing countries; we also estimate a range of values: maximum (t_s^{Max}); mean (t_s^{mean}); and minimum (t_s^{min}).

Now, since we don't have data on GDP/income by state, we would need to estimate it econometrically, which was done using the following specification drawn from the long-run steady-state equation of Coulombe (2000), who analyzed urbanization and income convergence across Canadian Provinces. This is the best regression, we were able to find, and that could be used to derive the estimate for a and b in the below equation:

$$(4) \quad \log\left(\frac{Y_i}{N_i}\right) = a + b \log\left(\frac{NU_i}{N_i}\right),$$

Where $\frac{NU_i}{N_i}$ is the ratio of the size of the urban population to the total population in state i

(the urbanization rate in state i) and $\frac{Y_i}{N_i}$ is the income per capita in state i. Now, expressing the above equation in per capita terms, we have:

$$(4') \quad \log y_i = a + b \log u_i,$$

Where y_i is income per capita in state i, and u_i is the rate of urbanization in state i.

We start with the regression of table 3 of Coulombe (2000)'s paper, and consider the regression column (RPIT: which is based on income prior to the transfers). The coefficient (t-statistic) of the rate of urbanization is given by:

$$(5) \quad \gamma_2 = 0.0393 \text{ (2.78)}, \text{ which suggests that}$$

$$(6) \quad SD(\gamma_2) = 0.0393 / 2.78 = 0.0141$$

However, we need to get the elasticity (b) consistent with steady state income (formula in the middle of page 719 of Coulombe (2000)'s paper). Hence we also write:

$$(7) \quad 1 - \gamma_1 = 0.051 \text{ (3.75)}, \text{ which suggests that}$$

$$(8) \quad SD(1 - \gamma_1) = 0.051 / 3.75 = 0.0136$$

The ultimate long-run estimate of b is given by:

$$(9) \quad b = \frac{\gamma_2}{1 - \gamma_1} = \frac{0.0393}{0.051} = 0.78$$

And, the variance of b is given by:

(10)

$$\begin{aligned} \text{Var}(b) &= \text{Var}\left(\frac{\gamma_2}{1-\gamma_1}\right) = \text{Var}\left\{\frac{\hat{\gamma}_2}{1-\hat{\gamma}_1} - \frac{\hat{\gamma}_2}{(1-\hat{\gamma}_1)^2}[(1-\gamma_1)-(1-\hat{\gamma}_1)] + \frac{1}{1-\hat{\gamma}_1}(\gamma_2 - \hat{\gamma}_2)\right\} \\ &= \left(\frac{\hat{\gamma}_2}{(1-\hat{\gamma}_1)^2}\right)^2 \text{var}(1-\gamma_1) + \left(\frac{1}{1-\hat{\gamma}_1}\right)^2 \text{var}(\gamma_2) \end{aligned}$$

Where, the last two RHS terms are the variance of the first-order Taylor expansion of the true variance around the estimated values of $(\hat{\gamma}_2, 1-\hat{\gamma}_1) = (0.0393, 0.051)$. There is, however, a better approximation but this would require that we have the estimate of the entire variance-covariance matrix, which we don't have; but this is good enough.

We can now compute the variance and standard error of the urbanization effect b as follows:

$$(11) \quad \text{Var}(b) = \left(\frac{0.0393}{(0.051)^2}\right)^2 (0.0136)^2 + \left(\frac{1}{0.051}\right)^2 (0.0141)^2 = 0.1186622069$$

And, Standard deviation is given by:

$$(12) \quad \sigma = 0.35$$

Now we can construct the following range of values for b:

$$(13) \quad (b-\sigma, b, b+\sigma) = (b_1, b_2, b_3) = (0.43, 0.78, 1.13)$$

Now we also have the corresponding estimates of the log of income per state:

$$(14) \quad \log y_i = a_k + b_k \log u_i, \text{ where } k=1,2,3 \text{ and the } b_k \text{ 's are given by the above equation.}$$

Finally, the a_k is given by the following algebraic manipulation, noting that we only have per capita income data for the national economy. By applying the anti-log operator, equation 14 can be written as follows:

$$(15) \quad y_i = e^{a_k} \cdot e^{b_k \log u_i}, \text{ summing over all states we have (note that } e^x \text{ is the exponential of } x: \text{ not to be confused with } e_s \text{ of equation 1, which is just a parameter.)}$$

$$(16) \quad \left(\frac{1}{n}\right) \sum_{i=1}^n y_i = e^{a_k} \cdot \left(\frac{1}{n}\right) \sum_{i=1}^n e^{b_k \log u_i}$$

Taking logs and re-arranging we have:

$$(17) \quad a_k = \log\left(\left(\frac{1}{n}\right) \sum_{i=1}^n y_i\right) - \log\left(\left(\frac{1}{n}\right) \sum_{i=1}^n e^{b_k \log u_i}\right) = \log \bar{y} - \log\left(\left(\frac{1}{n}\right) \sum_{i=1}^n e^{b_k \log u_i}\right)$$

Where \bar{y} is the national per capita income for which we have data; and the last RHS term is the log of a measure of the average national rate of urbanization, taken over the n states.

Now from equation 4', the total income of state i is given by:

$$(18) \quad Y_i^k = N_i \cdot e^{\log y_i^k} = N_i \cdot e^{(a_k + b_k \log u_i)}$$

Where b_k is obtained from the values of equation 13 and the a_k is obtained from equation 17, which requires knowledge of the size of population in state i (N_i); the national income per capita (y : GDP or GNP per capita or, even better, the personal income per capita); and the urbanization rate in state i (u_i). Since all these are available, we should be in a position to compute three estimates for total state i income: Y_i^1, Y_i^2, Y_i^3 .

Now we go back to equation (1) and restate the ultimate formula, which we can estimate:

$$(19) \quad T_i^k = e_s N_i - t_s \cdot N_i \cdot e^{(a_k + b_k \log u_i)}$$

Note that, for given (e_s, t_s) , there will be three sets of optimum transfers for each state (T_i^1, T_i^2, T_i^3) as well as for the total vertical transfers from the federal level to the states ($T^1 = \sum_{i=1}^n T_i^1, T^2 = \sum_{i=1}^n T_i^2, T^3 = \sum_{i=1}^n T_i^3$). And, the higher the value of k , the more transfers are allocated to the less urbanized states: for example, fewer transfers will be allocated to the Greater Khartoum State but more to Western Darfur.

Appendix III: Some Regression Evidence

Urbanization and Local State Revenue Capacity

A simple panel regression using state level data over 2002-2005 further corroborates the preliminary evidence of Figure 1, which suggests that there is strong association between the rate of urbanization and the capacity of the Sudanese state to generate revenue (Table 2)²⁴. The first regression of the Table estimates a regression of the log of the per capita revenue in state i on: the log of the VAT revenues collected at the state, as a proxy for fiscal capacity; the share of people under 14 years of age to total population, as a measure of dependency; the share of rural to total population; and the log of population density (measured by the number of people per square km). All these factors are often included in the assessment of tax capacity and expenditure needs in many studies around the world. State with higher fiscal needs, other things being equal, will have fewer resources to allocate towards discretionary projects such as capital investment. According to this regression, the share of rural population is negatively and significantly associated with local tax revenues. This suggest that states with large rural economies (i.e. less urbanized) will be at a disadvantage regarding own resource mobilization. Hence, other things equal, they should not be expected to raise the same level of revenues as more urbanized states. Though admittedly, our results are based on limited data and could be subject to several criticisms²⁵, they nevertheless, suggest that the Sudan is not an exception to the globally accepted empirical regularity regarding the central role of urbanization as a determinant of local state revenue capacity.

On the other results, the regression suggests that for every one Dinar increase in the fiscal capacity-- proxied by the internally collected VAT-- the own per person revenue collection increases by 0.19 Dinar. Also as expected, age dependency reduces revenue generation capacity but this effect is not statistically significant. Finally, the results lend support to the

²⁴ Table (1) presents the data used in this analysis.

²⁵ The overall performance of this model, in terms of R-square is relatively low implying that more information needs to be included in the assessment. The model was re-estimated with tax capacity proxied by the ratio of VAT to own revenue collection and all variables were expressed in log form, almost similar results were obtained (this result is not reported).

view that more densely populated regions have better ability at tax collection and resource mobilization in general.

Determinants of Federal Allocations

The model underlying this regression relates the per capita federal allocations to the covariates accounting for revenue means and expenditure needs at the state level²⁶ (regressions 2 of Table 2). The results of the fixed-effects regression²⁷ suggest two important findings. First, although the per capita federal allocation increases by 0.03 Dinar per one thousand increases in population it decreases by 0.09 Dinar for every one thousand increase in school age population. Therefore, to the extent that these two channels might, at least, cancel each other, these transfers could be judged as had not been influenced by need. Second, the densely population and, hence more urbanized and relatively wealthiest, states appear to have received larger federal allocations. However, this latter result may be simply reflecting the influence of the VAT reimbursements, which should favour states that collect more. Nevertheless, even when discounting the population density effect, it is clear that the current grant allocation system has failed to reflect “needs” considerations at the state level and, therefore, it is likely to have been counter-equalizing or at best neutral.

²⁶ It should be noted that the covariates employed in this analysis could be further refined for example by including household income, HDI, health indicators etc. at the state level. However, the reported results in this section give a general view of the fiscal “architecture” at the state level and the current federal allocation system.

²⁷ Hausman Chi-Square statistics suggests that the fixed effects model is more efficient compared to the random effects one. The state-specific constants were not reported for brevity.

Appendix IV: Tables and Figures

Table (1): Indicators of the States Fiscal Performance and Population Profile

Year	Own revenues per capita in SDD			Federal allocation per capita in SDD			VAT collection per capita in SDD			Population density			Population (in thousands)			% of children in age group 0-14			% of rural population		
	2003	2004	2005	2003	2004	2005	2003	2004	2005	2003	2004	2005	2003	2004	2005	2003	2004	2005	2003	2004	2005
Northern	2512.2	4752.1	9755.8	2287.3	5961.2	9635.2	191	370.5	128.1	1.8	1.8	1.8	614	624	634	39.4	39.1	39.4	85.7	83.7	83.5
River Nile	2227.6	8785.7	5097.4	2043.6	5272.3	8501	194.2	97.5	439.7	7.8	8	8.1	954	972	990	40.5	40.2	40.5	66.3	64.6	64.1
Red Sea	12388.4	13739	18542.8	124.3	498	871.7	2847.7	2142.5	6435.7	3.3	3.4	3.4	732	734	736	37.4	36.9	37.4	38.3	37.5	36.8
Kassala	1166.1	6205.8	2562.2	941.4	2278.3	3615.1	53.9	149.5	96.5	43.1	44.3	45.4	1584	1625	1666	40.9	40.9	40.9	66.1	63.9	63.4
Algedarif	2857.6	2860.8	4276.9	775.6	1974.4	3173.1	117.3	123.5	147.4	21.5	22.2	22.9	1621	1674	1727	42.2	42.2	42.2	72.5	70	69.8
Khartoum	11736	16502.6	15678.1	5134.2	6815.3	8496.5	8815.8	12046.1	15093.7	229	237.6	246.3	5352	5553	5757	36.2	36.2	36.2	13.6	12.8	12.5
Gezira	1236.5	1596.8	8910.9	1254.1	2706.6	4159.1	448.3	657	442.1	158	162.5	167	3692	3797	3903	42	41.7	42	79.1	76.5	76.1
Sinnar	59222.9	1527.4	2456.4	653.8	2906.6	5159.4	88.2	52	151.9	33.5	34.4	35.2	1268	1301	1334	43.6	43.2	43.6	72.6	70.3	69.8
W.Nile	2187.6	3498.6	5098.1	831.6	2502.8	4173.9	185.1	86.9	406.6	52.4	53.8	55.1	1595	1636	1676	44.8	44.4	44.8	72.9	69	66.7
B.Nile	948	6020.3	2802.3	1538.2	3767.8	5997.3	108.2	39.9	119	15.2	15.6	16.1	696	716	737	41.4	41	41.4	76.4	73.2	72.1
N.Kordofan	1630.1	3009.1	3807	916.2	2807.7	4699.2	240.8	285.8	197.4	8.4	8.5	8.6	1554	1578	1602	46.6	46.2	46.6	68.1	66.1	65.1
W.Kordofan	1660.3	3893.5	3982.1	1027.7	1731.1	2434.5	22.4	10.5	33.9	10.6	10.8	10.9	1183	1203	1219	46.1	45.8	46.1	79	77	76.3
S.Kordofan	72270.4	1154.3	1756.8	1027.3	2594.4	4161.6	14.2	75.7	9.8	14.6	14.8	15	1158	1174	1190	46.2	45.7	46.2	77.3	74.6	72.9
N. Darfur	450.3	854.6	5950	729.9	2502.7	4275.5	56.7	189.7	39.4	10.3	5.6	5.8	3064	1655	1707	44.9	44.6	44.9	43.2	79	77.9
W. Darfur	268.2	1559.7	1580.5	664.7	1179.8	1694.9	8.8	12	21.7	21.3	21.8	22.3	1693	1734	1775	44.2	43.7	44.2	88.9	86.4	86
S.Darfur	3812.8	388.4	3097.5	742.1	1483.9	2225.8	151.3	71.6	86.9	12.6	24.9	25.8	3,064	3171	3279	23	43.7	43.9	81.4	78	77.3

Source: The Central Bureau of Statistics and NSSF

Table (2): Analysis of the State Level own-revenues and the Federal Grant Allocation

Dependent Variable:	constan	Explanatory Variables				R ²	P-value of Hausman Test ¹
		Fiscal Capacity	Population Under 14	Rural Population	Pop. Density		
Own Revenue	t						
Regression 1: log (state revenue per capita)							
Coefficient ¹	12.89	0.19	-0.13	-78	0.18	0.20	
t-statistics	6.74	2.01	-0.27	-1.91	1.25		0.09
Dependent Variable:	constan	Explanatory Variables				R ²	P-value of Hausman Test
Grant Allocation	t	Fiscal Capacity	Population Under 14	Total Population	Pop. Density		
Regression 2: log (federal grants per capita)							
Coefficient ²	(state-specific fixed-effects)	0.18	-0.09	0.03	30.58	0.73	
t-statistics		0.96	-3.76	2.96	3.73		

Table (3): Fiscal Trends and Vertical Fiscal Imbalance

Year	Federal Revenues (billion SD)	Federal Expenditure (billion SD)	The Percentage of States expenditure to Federal Expenditure	The Percentage of Federal Transfer to Federal Revenues	Coefficient of vertical fiscal imbalance ¹
	(1)	(2)	(3)	(4)	(5)
1993/4	13.11	11.94	29.3	3.1	88.6
1994/5	28.47	27.82	32.9	2.5	92.3
1996	69.78	83	23.0	2.7	89.7
1997	108.56	124.36	29.6	4.4	87.0
1998	159.2	157.5	35.4	6.2	82.3
1999	205.2	197.5	44.0	6.2	85.3
2000	334	312.5	39.8	7.2	80.5
2001	365.2	342.8	41.1	6.8	82.3
2002	472.2	377	39.2	8.2	73.7
2003	703.6	563.3	36.9	5.5	81.4
2004	1023	793.6	42.6	8.2	75.1
2005	1218.4	1384.7	42.2	29.9	37.8

Source: Central Bank Annual Reports and NSSF

1/. The coefficient is determines as $C = 1 - G/E$, where, C is the coefficient of vertical balance, G is the amount of states expenditures determined by the central government (given by column (4) x column (1) in the table) and E is the total state expenditures (given by column (3) x column (1) in the table). By

construction, C takes values between zero and one, with values closer to zero indicating a larger vertical fiscal imbalance.

Table (4): Some Indicators of the States' population Profile and Fiscal Performance for (FY 2005)

State	Population in (1000s)/1	Urbanization Rate	Actual Per capita Federal Allocation (in Dinar)	Expenditure per capita (in Dinar)/2	Own Revenue Per Capita/2	Per cent of VAT to own Revenue (2003-2005) Period Average/2	VAT Transfer per Capita
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Northern	634	17	9635	521993	9756	6	546
Nahr Alnil	990	36	8501	334286	5097	6	316
Red Sea	736	63	872	449651	18543	24	4524
Kassala	1666	37	3615	198645	2562	4	92
Algedarif	1727	30	3173	191629	4277	4	171
Khartoum	5757	88	8497	57485	15678	82	12778
Algezira	3903	24	4159	84792	8911	28	2451
Sinnar	1334	30	5159	248083	2456	3	79
W. Nile	1676	33	4174	197460	5098	6	321
B. Nile	737	28	5997	449041	2802	5	151
N. Kordofan	1602	35	4699	206581	3807	10	373
W. Kordofan	1219	24	2434	271488	3982	1	32
S. Kordofan	1190	27	4162	278104	1757	2	42
N. Darfur	1707	22	4276	193874	5950	12	702
W. Darfur	1775	14	1695	186447	1581	2	28
S. Darfur	3279	23	2226	100928	3097	8	260
Total	29932						
Mean	1871	33	4580	248156	5960	13	1429
Std	1354	18	2508	133222	4950	20	3249
Minimum	634	14	872	57485	1581	1	28
Maximum	5757	88	9635	521993	18543	82	12778

1/Source: Central Bureau of Statistics.

2/Source: Ministry of Finance and National Economy and SSNF

Table (5): Baseline Per Capita Estimates of the Federal Allocation Based on the Proposed Formula

State	Actual Per capita Federal Allocation in 2005 (in Dinar)	Allocation: High Growth- Urbanization Effect	Allocation: Medium Growth- Urbanization Effect	Allocation: Low Growth- Urbanization Effect	Allocation: High Urbanization Effect (Inclusive of VAT Transfers)	Allocation: Medium Urbanization Effect (Inclusive of VAT Transfers)	Allocation: Low Urbanization Effect (Inclusive of VAT Transfers)	Per Capita Federal Allocation as % of Total	Allocation: Medium Urbanization as % of Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Northern	9635	3503	6638	12579	4049	7184	13126	13	8
Nahr Alnil	8501	2496	3590	5164	2812	3906	5480	12	4
Red Sea	872	1955	2304	2716	6479	6829	7241	1	7
Kassala	3615	2475	3536	5051	2567	3628	5143	5	4
Algedarif	3173	2680	4085	6226	2851	4256	6397	4	5
Khartoum	8497	1694	1777	1865	14472	14555	14642	12	16
Algezira	4159	2977	4942	8204	5428	7393	10655	6	8
Sinnar	5159	2692	4117	6297	2771	4196	6376	7	4
W. Nile	4174	2643	3982	5999	2964	4303	6321	6	5
B. Nile	5997	2814	4461	7072	2965	4612	7223	8	5
N. Kordofan	4699	2543	3714	5423	2916	4087	5796	6	4
W. Kordofan	2434	3005	5026	8406	3037	5058	8438	3	5
S. Kordofan	4162	2879	4651	7514	2921	4693	7556	6	5
N. Darfur	4276	3125	5395	9316	3827	6097	10018	6	6
W. Darfur	1695	3766	7572	15222	3795	7600	15250	2	8
S. Darfur	2226	3063	5203	8839	3323	5463	9099	3	6
Mean	4580	2769	4437	7243	4199	5866	8673	6	6
Std	2508	511	1436	3334	2938	2673	3235	3	3
Minimum	872	1694	1777	1865	2567	3628	5143	1	4
Maximum	9635	3766	7572	15222	14472	14555	15250	13	16

Source: The Central Bureau of Statistics, NSSF and own calculation

Table (6): Proposed Federal Allocation in per capita SDD and percentage terms FY 2008

State	Per Capita Allocation: high Income Urbanization Effect	Per Capita Allocation: Medium Income Urbanization Effect	Per Capita Allocation: low Income Urbanization Effect	Per capita Allocation: high Income Urbanization Effect (VAT included)	Per Capita Allocation: Medium Income Urbanization Effect (VAT included)	Per capita Allocation: Low Income Urbanization Effect (VAT included)	Per Capita Percentage Share Based on high Band Estimate	Percentage Share Based on Medium Band Estimate	Percentage Share Based on Low Band Estimate	Percentage Share Based on high Band Estimate (VAT added)	Percentage Share Based on medium Band Estimate (VAT added)	Percentage Share Based on low Band Estimate (VAT added)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Northern	5596	10510	19739	6142	11056	20285	8	9	11	7	8	10
Nahr Alnil	4006	5732	8202	4322	6048	8518	6	5	5	5	4	4
Red Sea	3136	3677	4310	7661	8201	8834	4	3	2	8	6	4
Kassala	3964	5624	7978	4057	5716	8070	6	5	4	4	4	4
Algedarif	4311	6548	9944	4482	6719	10115	6	6	6	5	5	5
Khartoum	2713	2827	2945	15491	15604	15723	4	3	2	17	12	8
Algezira	4760	7837	12902	7211	10287	15353	7	7	7	8	8	8
Sinnar	4345	6641	10150	4423	6719	10228	6	6	6	5	5	5
W. Nile	4115	6018	8801	4436	6339	9122	6	5	5	5	5	4
B. Nile	4452	6941	10823	4603	7093	10974	6	6	6	5	5	5
N. Kordofan	4053	5853	8453	4426	6226	8826	6	5	5	5	5	4
W. Kordofan	4772	7874	12990	4804	7905	13022	7	7	7	5	6	6
S. Kordofan	4523	7143	11280	4565	7185	11322	6	6	6	5	5	6
N. Darfur	4928	8346	14135	5630	9048	14837	7	7	8	6	7	7
W. Darfur	6007	11952	23780	6036	11980	23808	9	11	13	6	9	12
S. Darfur	4865	8151	13659	5125	8412	13919	7	7	8	5	6	7
Mean	4409	6980	11256	5838	8409	12685	6	6	6	6	6	6
Std	808	2251	5183	2787	2666	4491	1	2	3	3	2	2
Minimum	2713	2827	2945	4057	5716	8070	4	3	2	4	4	4
Maximum	6007	11952	23780	15491	15604	23808	9	11	13	17	12	12

1/. Bases on the assumption of all the states maintain 15 per cent average tax and spend 39 per cent of their budgets on services, which we take as a measure of need.

Source: The Central Bureau of Statistics, NSSF and own calculation 93415 134540 202957

Table (7): Proposed Federal Allocation (in million SDD) FY 2008

State	Population (In 1000s)	Urban Population (In 1000s)	Actual Allocation Year (2005)	Allocation: high Income Urbaniza tion Effect	Allocation: Medium Income Urbaniza tion Effect	Allocation: Low Income Urbaniza tion Effect	Allocation: High Income Urbanization Effect (VAT added)	Allocation: Medium Income Urbanization Effect (VAT added)	Allocation: Low Income Urbanization Effect (VAT added)	Per Capita Percenta ge Share Based on high Band Estimate (VAT added)	Per Capita Percentage Share Based on high Band Estimate (VAT added)	Per Capita Percenta ge Share Based on high Band Estimate (VAT added)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Northern Nahr	624	103	6109	3492	6558	12317	2560271305	4504265563	8155254101	1	1	1
Alnil	1012	349	8416	4054	5800	8299	4326204156	6055224306	8529139266	1	1	1
Red Sea	735	466	642	2307	2704	3170	5027663987	5320129043	5662978451	1	1	1
Kassala								1580531977	2235715132			
	1671	598	6023	6623	9395	13327	11186806254	6	8	3	3	3
Algedarif								1992482356	3010816541			
	1736	507	5480	7484	11366	17263	13219880772	6	6	3	3	4
Khartoum								1666408321	1705370546			
	5720	4939	48914	15519	16168	16845	162901084944	44	04	39	29	21
Algezira								1289545677	2061216393			
	3903	914	16233	18580	30589	50361	82082738186	26	86	20	23	25
Sinnar								1195260972	1821331051			
	1337	387	6883	5811	8881	13575	7856442664	4	0	2	2	2
W. Nile								1760066439	2549014947			
	1692	552	6996	6961	10180	14888	12205737713	3	3	3	3	3
B. Nile	729	201	4420	3245	5060	7888	2503190709	3840419723	5925322708	1	1	1
N. Kordofan								1564541574	2233039833			
	1605	552	7528	6504	9393	13566	11016736317	3	9	3	3	3
W. Kordofan								1178136795	1941176671			
	1223	288	2968	5839	9633	15892	7156346642	1	5	2	2	2
S. Kordofan								1039816450	1639214690			
	1217	318	4952	5506	8696	13733	6602679738	8	8	2	2	2

N. Darfur	1718	367	7298	8466	14338	24282	15650466615	2567358141	4264819425			
W. Darfur	1783	243	3008	10708	21305	42389	19057214949	3786673019	7529056394	4	5	5
S. Darfur	3247	726	7298	15796	26468	44352	52646828501	8764264459	1462843461	5	7	9
Total	29952	11511	143168	126894	196535	312147	416000293451	5696067603	8234575815	13	15	18
Mean	1872	719	8948	7931	12283	19509	26000018341	3560042252	5146609884	100	100	100
Std	1343	1144	11169	4822	7785	13864	42128163490	4870703204	6419446009	6	6	6
Minimum	624	103	642	2307	2704	3170	2503190709	3840419723	5662978451	10	9	8
Maximum	5720	4939	48914	18580	30589	50361	162901084944	1666408321	2061216393	1	1	1
								44	86	39	29	25

Source: Own calculation

Figure 1: Own State Revenue per Capita in Sudanese Dinars (ordered by urbanization rate in 2005)

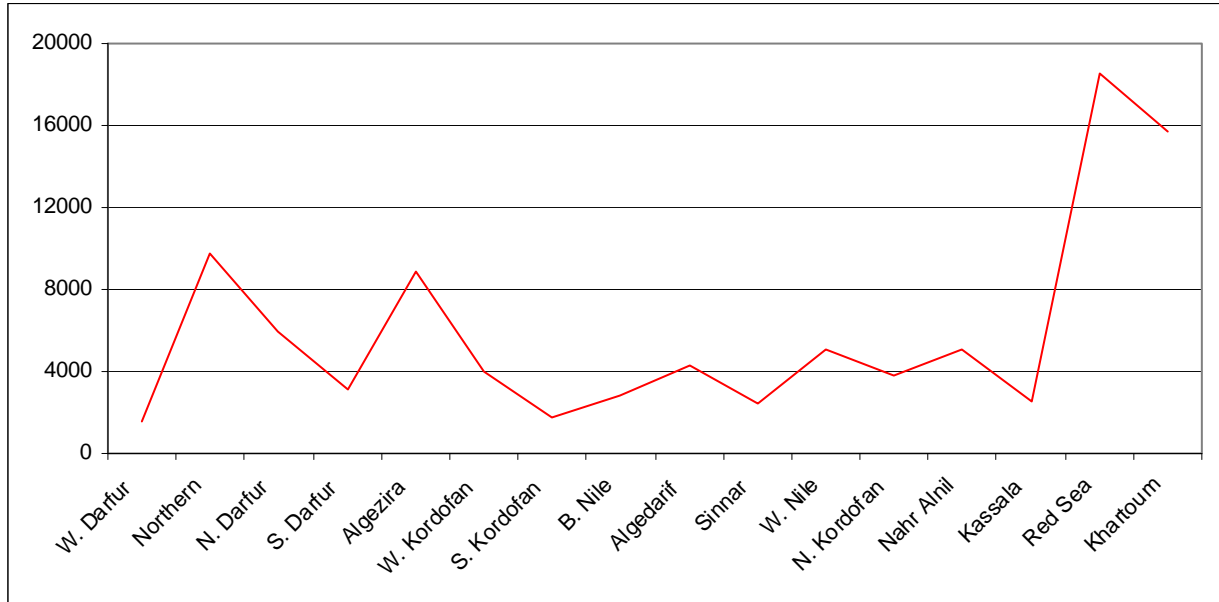


Figure 2.A: Federal allocation per capita in Sudanese Dinars (ordered by population density in 2005)

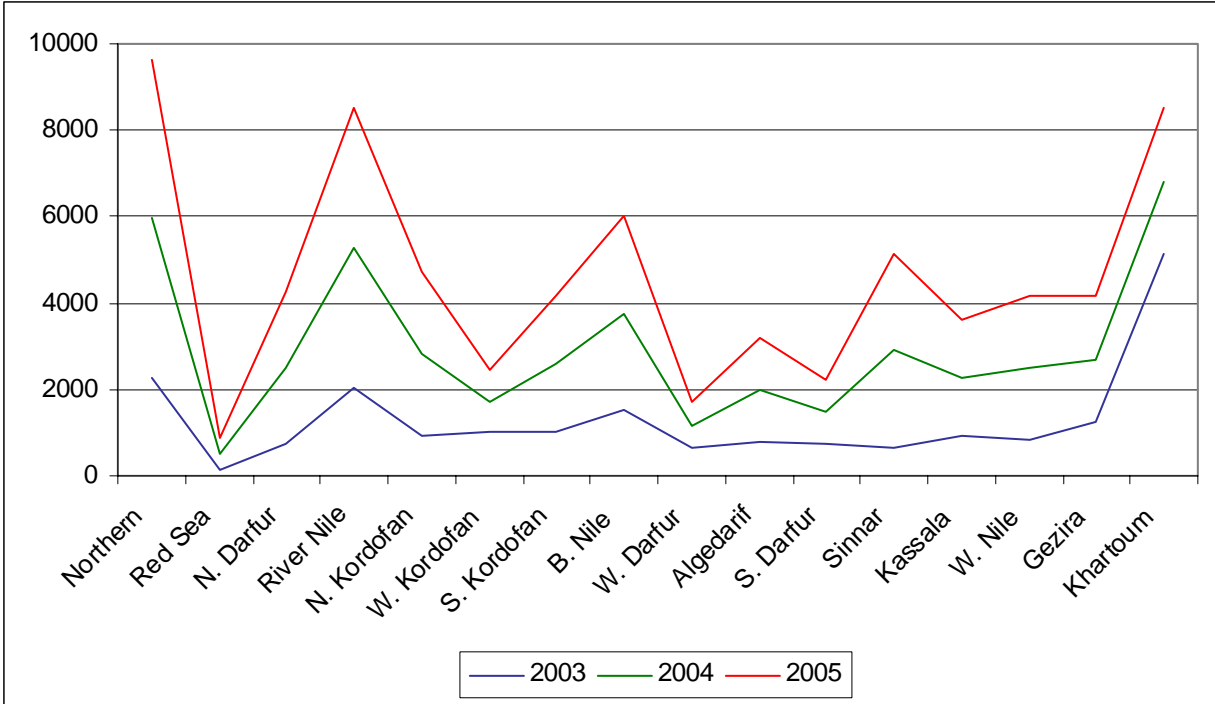


Figure 2.B: Federal allocation per capita in Sudanese Dinars (ordered by share of dependent children in 2005)

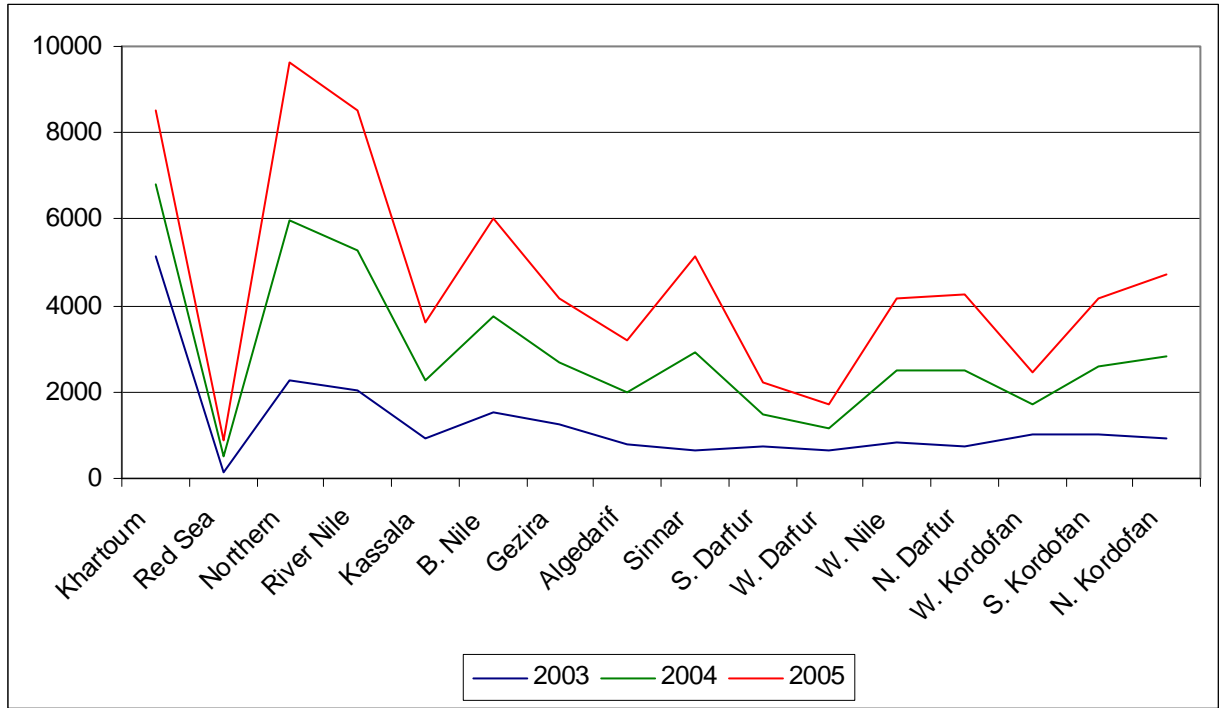


Figure 2.C: Federal allocation per capita in Sudanese Dinars (ordered by share of rural population in 2005)

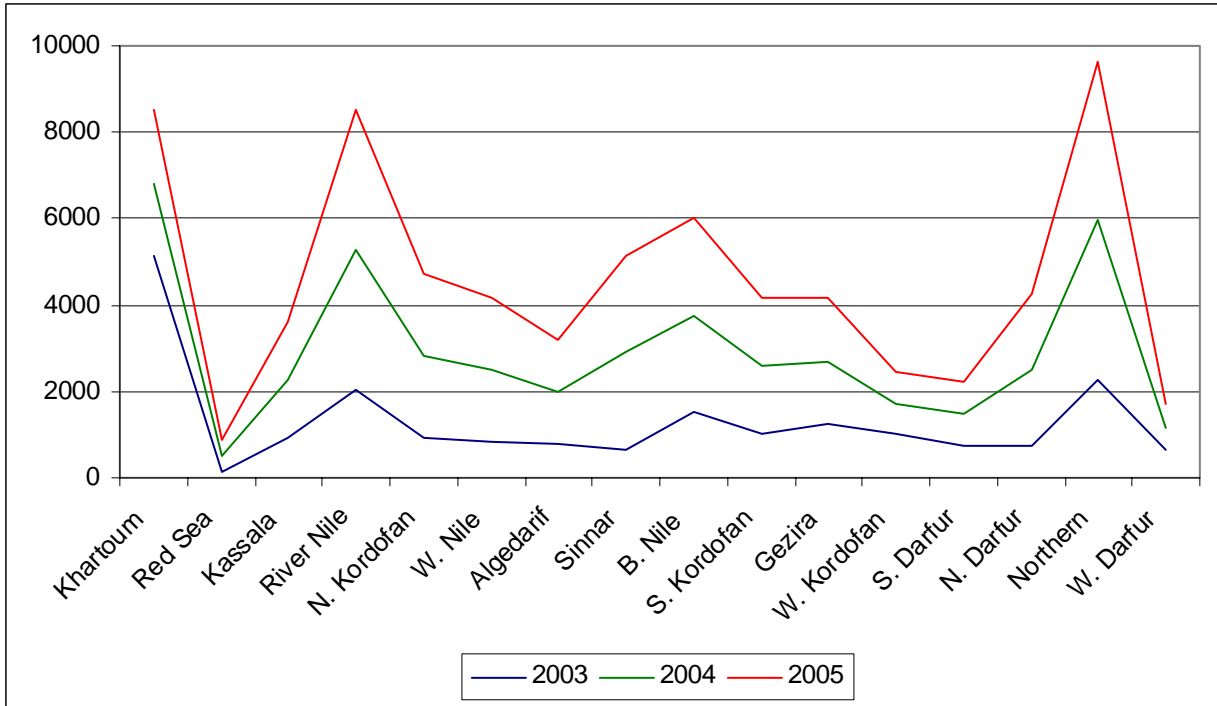


Figure 3: Actual and "Optimum" Federal Grants: State by State (2005)

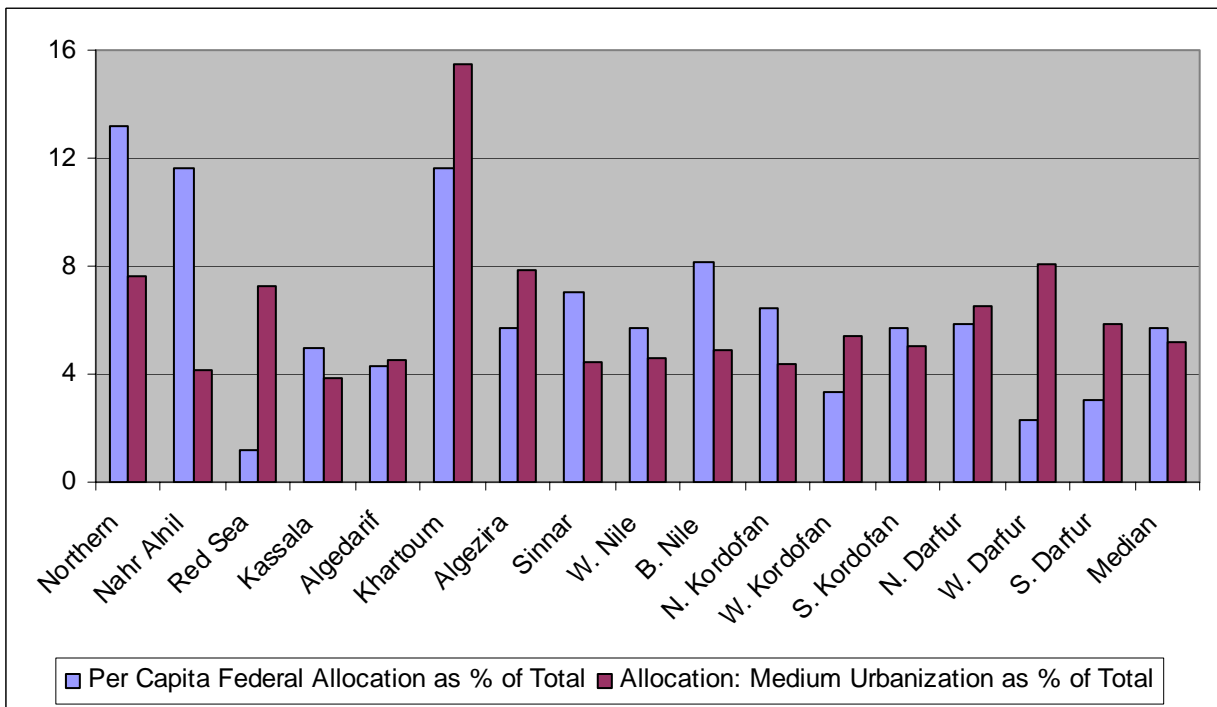
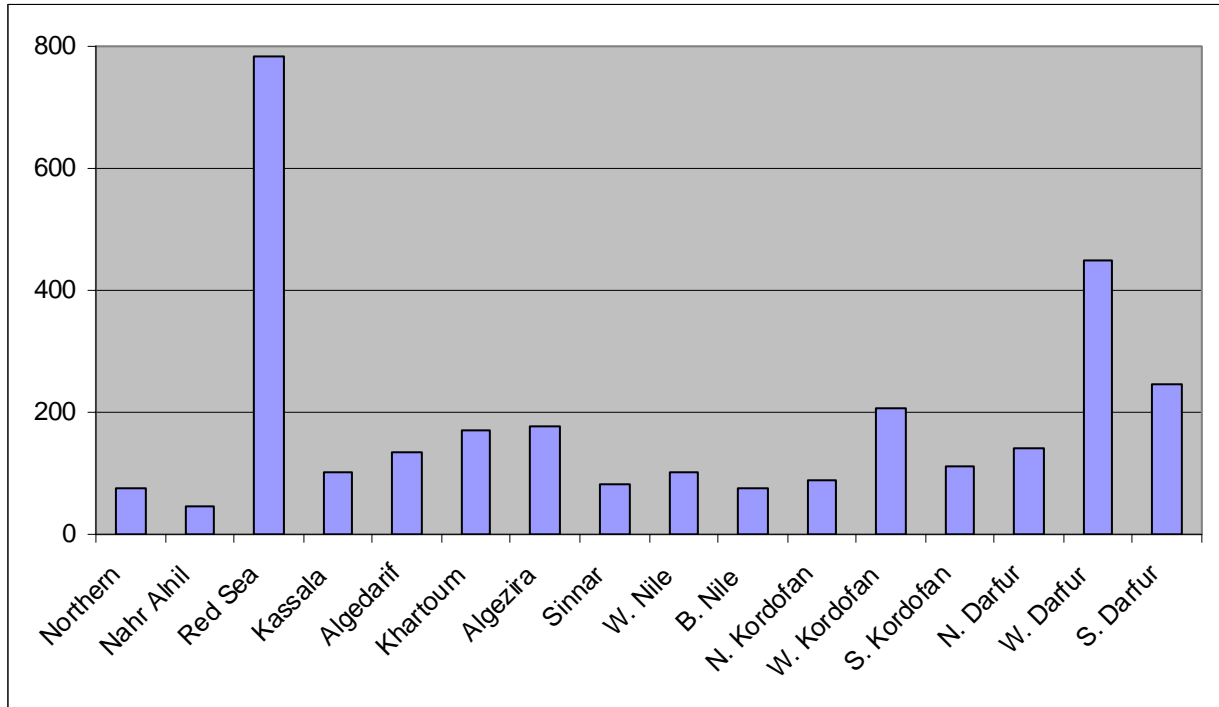


Figure 4: Gainers and Losers (%ratio of optimum to actual grants: FY 2005)/1



1/This does not imply a zero sum game, but an equitable distribution of the pooled resources in the light of the proposed formula.

Figure 5: Actual and "Optimum" Total Federal Grants to the Northern States in SDD (FY 2005)

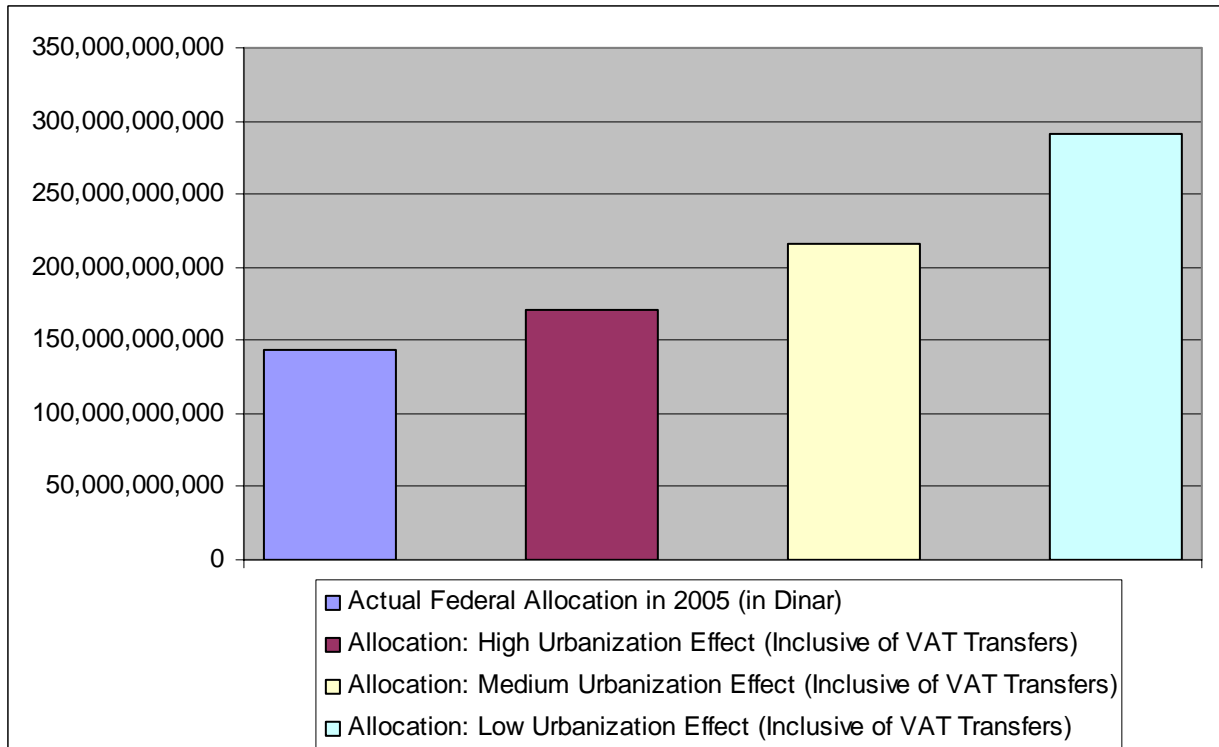


Figure 6: Projected "optimum" horizontal Allocation by Shares of Per capita Transfers to the total (FY 2008): Three scenarios

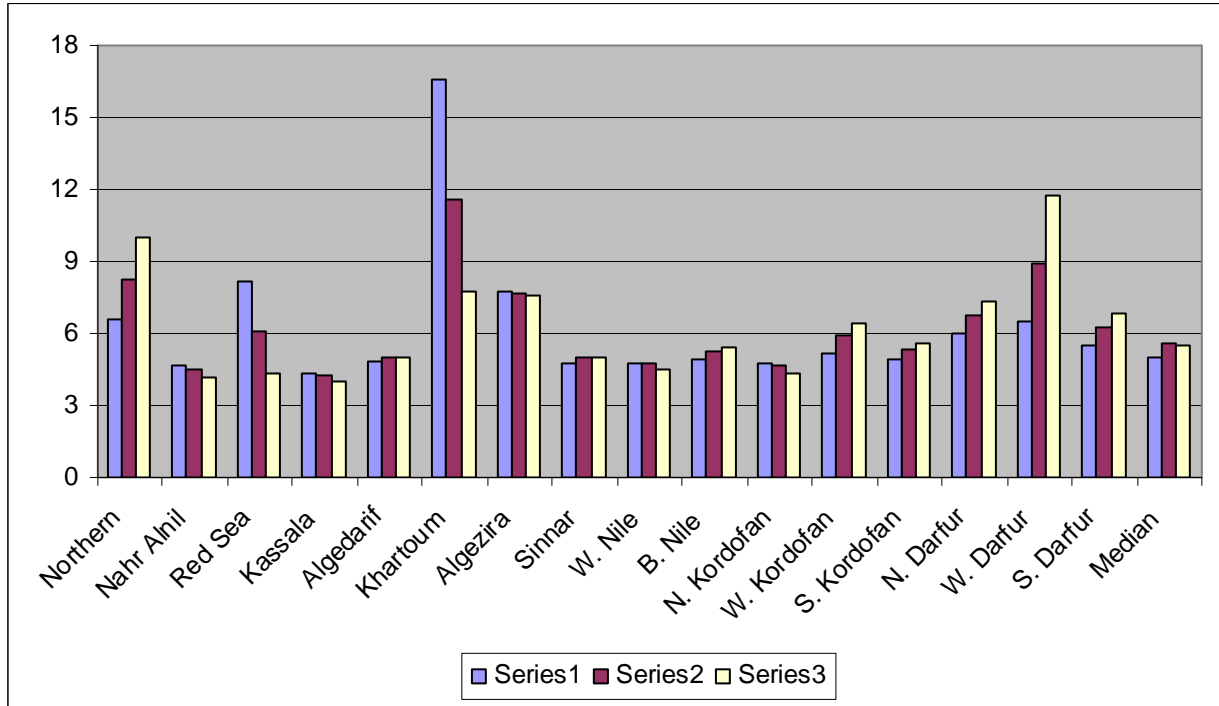


Figure 7: Projected "optimum" horizontal Allocation by Absolute Transfers to the total (FY 2008): Three scenarios

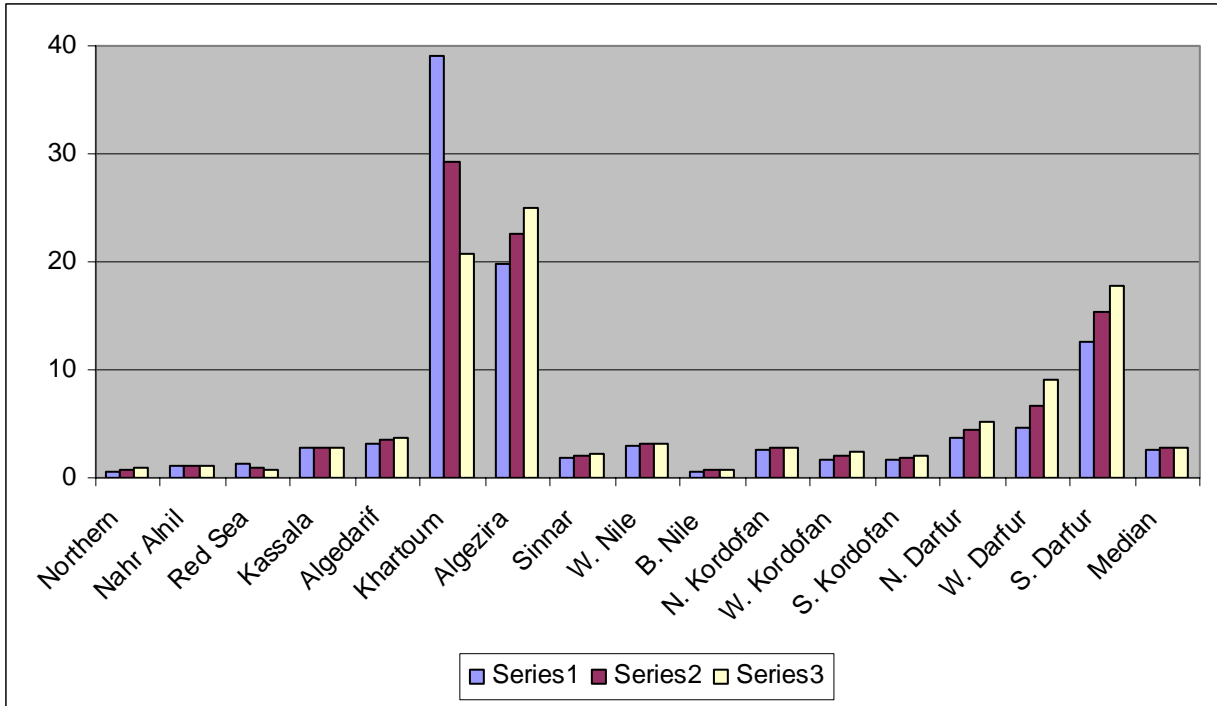
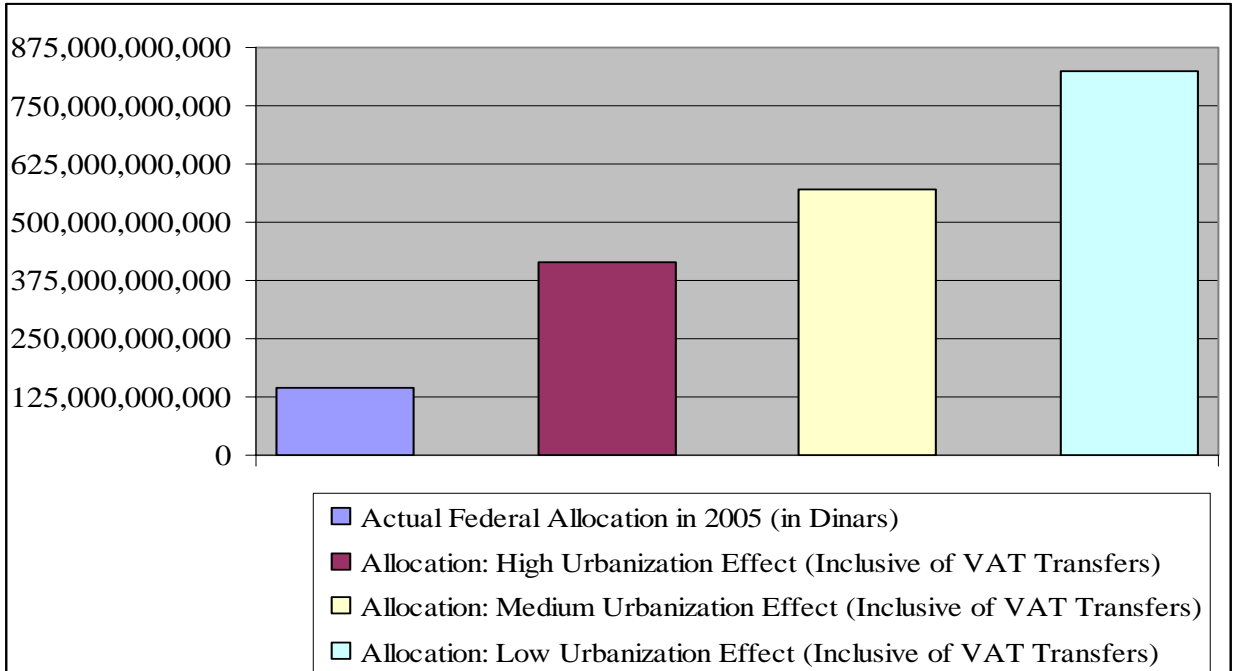


Figure 8: Actual and "Optimum" Total Federal Grants to the Northern States in SDD (FY 2008)



Discussant's Notes
Toward an Equitable Transfer System for the Sudan

Ibrahim A. El-Badawi & Kabbashi Suliman

Discussed

by

Medani M.Ahmed

University of Khartoum

Introduction:

- This paper is a very important attempt to address the issue of federal government transfers to sub-national levels of government.
- The authors have exerted great efforts in the paper and reached some important results and conclusions which of policy relevance
- The following comments are motivated by the findings of the paper. The comments attempt to enrich the ongoing discussion on How to design and implement an equitable, efficient and viable fiscal federalism and sound intergovernmental relations system in the Sudan.
- Within this context equitable, efficient and operational formulas of vertical and horizontal distributions of transfers have to be designed and politically accepted. They must be flexible enough to accommodate changes and adjustments and become sustainable

Specific Comments on the Paper:

- The paper has shown that vertical fiscal imbalance is substantial in almost all states implying some serious problems with regards to revenues generation capacities and expenditures assignments at all tiers of government in the Sudan.
- The paper found no systematic relationship between transfers per capita and any of the three factors: **population density, share of rural population and the share of children in the age group 0-14.**
- States with higher rural population , and larger proportion of population in the 0-14 age group and lower population density would receive fewer transfers, but the data showed inconsistencies across states.

Assumptions of the equalization Formula:

- In p8 the assumptions in Para 20 which are used to estimate the equalization formulas need to be discussed more carefully as they raise some questions of relevance to reality of the situation in the Sudan:
- The first assumption of the paper is that expenditure needs at the state level is assumed to be given by the average share of the economic and social services in the federal Budget and also is taken as a Representative National Average for the period 1993-2005.
- This is a rather simple assumption and might not reflect reality as needs are normally referred to mean **essential social services [like education, health, water, electricity, etc.]** provided by any level of government and the people are **willing to finance through paying some taxes.**
- The social and economic services in the federal budget are not transfers to the states but part of chapter II [centralized and steering expenses of the federal

- government activities, including purchases and depreciation allowance, debt servicing and also defense and security spending].
- The transfers to states are found in chapter III of the federal government not in chapter II or part of chapter II [social and economic services] as the paper has stated and assumed.
 - However a proper denoting of the Needs of the States should be made by calculating the cost of **all service deliveries of goods and services in different states.**
 - This exercise is of course very expensive and costly and will be hampered by lack of detailed disaggregated data in the Sudan.
 - It is definitely beyond the scope and objective of the paper.
 - Yet, another rather operational assumption for needs is often given by **population; a state population or the ratio of state population to national population which is a very good measure of Needs in the equalization equation.**
 - The second assumption of the model is that the ratio of VAT to own revenues [called by the authors **Average Tax Rate, is being taken as a proxy to Fiscal capacity. This is an unsuitable assumption for a number of reasons:**
 - First fiscal capacity is usually denoted by the state per capita income whether we take state GDP per capita or any derivative of it. Although it has not been available for a long time, it is now being done by some researchers.
 - Secondly, we need to mention that the state's total revenues can not properly measure the state income [as the state revenue is just a part of the state income] and thus can not proxy **the state fiscal capacity.**
 - Taking only VAT [just a part of state revenue] as a measure of fiscal capacity [as the paper assumed] will be improper representation of the state fiscal capacity.
 - Thirdly, VAT is the most unequally distributed type of transfers from the federal government to the states as about 75% of its yields has been going only to three states[Khartoum, Red Sea and Gezira]. The VAT is calculated on the origin of the goods taxed which has been centered in these three states.
 - **As a result, the VAT can not possibly reflect any good proxy of income or fiscal capacity of different states in the Sudan.**

Vertical versus Horizontal transfers:

- The paper has [time and again] stated and restated that it is addressing the issue of **vertical distribution of transfers and not the horizontal one**[See pp 1, 3,5,7,9,10,and 13]. One has the impression that the paper was supposed to deal with the horizontal distribution of the transfers not the vertical one].
- Ideally assessment of vertical distribution of transfer should be based on carefully **examining the functions and mandates assigned to various tiers of government. The assignment of expenditures responsibility of different levels of government is the most critical and initial step in designing any intergovernmental relations scheme in the Sudan.**
- Following the principle of "Finance follows functions", **the functions assigned by the constitution to these different levels of federal rule should be clearly identified**

- and determined and then some sort of political consensus is needed to determine the cost of service delivery at each level.
- Expenditures assignments and detailed costing of services including agreeing on standard and quality of service delivery as well as standard rate of taxes to finance them are priorities that have to be done for the whole country.
 - It is important to mention that agreement on expenditures assignments is desirable and also very difficult thing to achieve without national political consensus.
 - If people decide that e.g. achieving the MDGs is a top national priority then expenditures assignments at the federal, state and local levels must reflect this objective.
 - The consolidated budget of the country should reflect the expenditures assignment of responsibilities.
 - In other words, budgeting should be used to allocate resources at the three levels of government in a coordinated way to meet the objectives.
 - Given the inadequacy of detailed and reliable data both at the national and state, and local levels, the exercise will be very difficult to carry out efficiently.
However, using the historical fiscal data and possibly some states' data some sort of costing of the expenditures assignments of different levels of government could be done, though not perfectly.

Income Elasticity of Urbanization:

- The paper has used the level of Urbanization [especially the income elasticity of urbanization to compare the aggregate amount of transfers in 2005 at three levels:
- A high income effect for urbanization [high fiscal capacity and thus lower transfers],
- a medium income effect of urbanization [medium fiscal capacity and transfers],
- and finally, a low income effect of urbanization [low fiscal capacity and possibly high expected transfers].
- **The main finding of the paper is that the actual transfers in 2005 depicted a situation much closer to the low case scenario.**
- The authors have admitted [but not said explicitly in p9] that using urbanization as a proxy to fiscal capacity to determine transfers is by all means not free of risks and problems.
- They argued that "...However given the fact that the process of urbanization, especially the phenomenal expansion of greater Khartoum state, is more a reflection of the economic decline of the rural sector than a dynamic structural transformation toward a more complex and higher productivity economy, it is probably prudent to assume a medium to low elasticity.
- It is prudent not to strongly believe in the authenticity of urbanization data itself.
- Urbanization in many states is very low indeed.
- Therefore, one expects that urbanization abnormality of Khartoum state [like the skewed VAT distribution] would render it a bad measure and proxy of fiscal capacity for the case of the Sudan.
- And as a result its value in estimating the equalization equation would be very low, as the paper itself has found.

Comments on the Paper's Simulations Results:

- However, the % rural population ratio of a state would probably constitute a better measure of an inverse function of fiscal capacity [1/ fiscal capacity].
- Therefore, the higher is the % ratio of the rural population to the state total population, the lower fiscal capacity would be to generate own revenues and the higher expected transfers from the federal government.
- Conversely, the lower the % ratio of rural population in the total state population, the higher would be the fiscal capacity and the lower expected transfers from the federal government to the state.

Key Assumptions:

- In the section titled: **Key Assumptions [pp 9-10]** the paper argued that the average tax rate in the Sudan in the period 1970-2002, was about 33%.
- It is not clear from the paper which tax rate the authors are talking about. Are we here talking about direct taxes rates or indirect taxes' rates during the 1970-2002 period which has witnessed the birth and death of so many taxes.
- Without proper documentation to a specific type of taxes , the proposed average tax rate of 33% is misleading and ambiguous.
- In the section titled: **Key Assumptions [pp 9-10]** the paper argued that the average tax rate in the Sudan in the period 1970-2002, was about 33%.
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- Without proper documentation to a specific type of taxes , the proposed average tax rate of 33% is misleading and ambiguous.

Two questions need to be addressed and answered?

- The questions which the paper did not ask are:
- First: has the Sudan been using a revenue sharing formula between the central and Sub-national governments?
- Has the horizontal distribution of central transfers [resulting from this revenue-sharing formula] been equalizing?
- A careful scrutiny of the fiscal structure in the Sudan shows that the country has been practicing a rainbow of fiscal policies and structures which have been changing over time due to objective economic and fiscal reasons and realities.
- However the period 2000-2007 has witnessed a marked change in the structure of taxes in the Sudan. The introduction of VAT has abolished most of the indirect taxes that have prevailed for decades and also installed some reimbursements of some abolished states' taxes, like agricultural compensation tax, petrol price difference omission and additions taxes.
- The VAT is an important example of tax revenue sharing or revenue sharing between the federal and states governments [currently 55% goes to the former and 45% to the latter].
- However, there are certain direct taxes assigned to the federal and the states governments.

- So the assumption made by the paper that the base of tax should be divided up between the federal and state levels is only discernable in the VAT which reflects an improvement in the tax structure and tax system in the Sudan.
- In addition, there are also some revenue sharing formula between the state and the localities with regards the state' taxes.
- The yields of these state taxes have been very low and declining overtime, and as a result the localities have resorted to imposing many fees, rates and charges to finance chapter II ,purchases of goods and services [running expenses and chapter III [development spending].
- These fees are not calculated on tax-bases or income bases of the beneficiary but are imposed arbitrarily.

Transfers Estimation:

- The paper did three estimates of federal allocation of transfers based on the importance of urbanization as a proxy of inter-state income levels [their fiscal capacity or resources mobilization capacity].
- The paper argues that net transfers per capita should be inversely related to the urban elasticity of income.
- The results in table [6] have shown dramatic differences in the less urbanized states.
- Although Khartoum state [the most urbanized state] got relatively lower transfers for the high, medium and low urbanization effects, these allocations have risen significantly when we add VAT transfers to total transfers.
- This is an added proof that VAT is not a good measure of the states income and fiscal capacity.
- The three states are relatively more urbanized than others, but they did receive the highest % ratios of VAT and as well as the highest ratios of the federal transfers.
- This tells us that the NSSF has not been adopting an equalization formula [EG=F [Needs, fiscal capacity, tax effort, state tax revenue and urbanization] because states with high fiscal capacity or per capita income should have been receiving relatively lower federal transfers.
- Secondly and as we mentioned above that the use of he VAT as a proxy to state income or fiscal capacity has somewhat distorted the results and made them inconsistent with theory and empirical research on horizontal allocation of transfers [states with high fiscal capacity received larger amounts of transfers.
- In p 8 the paper assumed that expenditure needs are measured by the share of social and economic services of the federal budget which amounted on average to 23.9% for the period 1993/4-2005.
- Our own calculations of this average indicated that it amounted to 21% of current expenditures not as a ratio of total federal expenditures for the period 1990-2005, with a ratio of 11% for economic services and 10% for social services.
- One is tempted to assume that Expenditures Needs of the people would better be represented by the social services Share in the federal budget which by all means has received very little share of the current expenditures in the federal budget

Population Size and Needs:

- In Para 28 p 10 the paper stated that the “optimum” inter-state grants allocations in terms of total rather than per capita transfers, reflect the fundamental primacy of population size as a determinant of the overall size of the vertical transfers as well as its horizontal allocation across states”.
- One would tend to agree that total population is a primary factor in determining needs and therefore the amount of total transfers going to the state.
- But there are also other factors that are crucial in determining the share of each state under the equalization grant or revenue sharing formula.

Concluding Remarks:

The paper is an important contribution in the efforts and attempts to reach an efficient and equitable system of distribution of transfers in the Sudan. It opens up an avenue and a way forward to seriously addressing the determinants and challenges of the proposed transfers’ distribution system. Hopefully, more research and efforts would follow and political consensus would be reached to assign expenditures responsibilities for all levels of government in an efficient and transparent manner.



يونيكونز للإستشارات المحدودة

Intergovernmental Transfers in Sudan: A Proposed Approach for Horizontal Distribution²⁸

Ali Abdel Gadir Ali²⁹
Arab Planning Institute,
Kuwait.
E-Mail: aali@api.org.kw
(Preliminary Draft; May, 2007)

²⁸ This paper is written for Unicons Consultancy Ltd and the FFAMC, Khartoum. Sudan. It is to be presented at the workshop entitled “Fiscal Federalism in Sudan” (20th June, 2007) that is being jointly organized by Unicons and the FFAMC and sponsored by the World Bank.

²⁹ I am grateful to Ibrahim Elbadawi, who presented the earlier version, the participants of the workshop at an earlier held workshop (December, 2006), and Mrs. Abda El-Mahdi for very helpful comments on the earlier version. I am particularly grateful to Ms. Hadeel Abu Lughd, of API, for very competent research assistance. In addition I am grateful to Unicons Consultancy Ltd. for compiling the data on which the results of this study are based.

I. Introduction:

According to the Interim National Constitution of the Republic of Sudan (INC) the “overarching aims of economic development shall be the eradication of poverty, attainment of the Millennium Development Goals, guaranteeing the equitable distribution of wealth, redressing imbalances of income and achieving a decent standard of life for all citizens” (article 10 (1)). These aims are to be achieved in the context of “a decentralized State with the following levels (a) The national level of government, (b) Southern Sudan level, which shall exercise authority in respect of the people and **states** in Southern Sudan, (c) The state level of government, which shall exercise authority at the states throughout the Sudan and render public services through the level closest to the people, (d) Local level of government, which shall be throughout the Sudan” (article 24). One of the principles of inter-governmental linkages that is to be respected in the administration of the decentralized system is that “the linkage between the **national level** and the **states in Southern Sudan** shall be through the **government of Southern Sudan**” (article 25 (a); emphasis is not in the original).

Within the context of the decentralized system of government, and the desired linkages between various levels of government, the INC provided guiding principles for the equitable sharing of resources and common wealth. Among these principles are that “ (1) resources and common wealth of the Sudan shall be shared equitably to enable each level of government to discharge its legal and constitutional responsibilities and duties and to ensure that the quality of life, dignity and living conditions of all citizens are promoted without discrimination on grounds of gender, race, religion, political affiliation, ethnicity, language or region. (2) The sharing and allocation of the resources and common wealth of the Sudan shall be based on the premise that all parts of the country are entitled to development. (3) The National Government shall fulfill its obligations to provide financial transfers to the Government of Southern Sudan, and shall, except as otherwise provided herein, apportion revenues among other states..(6) Revenue sharing shall reflect a commitment to devolution of powers and decentralization of decision making in regard to development, service delivery and governance.... (11) No level of government shall withhold any allocation or financial transfers due to any other level of government” (article 185).

In the INC, the sources of national revenue, Southern Sudan revenue, and states revenue, are respectively regulated by articles 193, 194, and 195. Article 192 deals with the sharing of oil revenue. In this respect it is important to note that the allocation of Southern Sudan non-oil revenue is regulated by article 196 which states that “(1) Notwithstanding the provisions of Articles 192, 193, and 194 herein, the National Government shall allocate fifty percent of the national non-oil revenue collected in Southern Sudan, as provided for under Article 193 above, to the Government of Southern Sudan to partially meet the development costs during the interim period. (2) The Government of Southern Sudan and states shall retain and dispose of such other income raised and collected under their taxing powers”.

The INC created a special commission, the Fiscal and Financial Allocation and Monitoring Commission (FFAMC), to “**ensure the transparency and fairness in regard to the allocation of nationally collected funds to the Government of Southern Sudan and the states**” (article 198). In this respect all “revenues collected nationally for or by the National Government shall be pooled in a National Revenue Fund administered by the National Treasury. Such Fund shall embrace all accounts and sub-funds, into which monies due to the Government are collected, reported and deposited” (article 197).

The duties and responsibilities of the FFAMC are enumerated in article (198-2) as “(a) monitor and ensure that **equalization grants from the National Revenue Fund** are promptly transferred

to respective levels of government, (b) guarantee appropriate utilization and sharing of financial resources, (c) ensure that revenues allocated to conflict affected areas are transferred in accordance with agreed formula, (d) **safeguard transparency and fairness in the allocation of funds to the Government of Southern Sudan and the states according to established ratios or percentages stipulated in this Constitution**” (emphasis is not in the original).

Having noted the above, the rest of this note is organized in two parts. The first part consists of the following: Section (II) provides some background information needed to indirectly estimate GDP at State level; section (III) provides information on the current system of transfers to Northern states with emphasis on 2005. Section (IV) presents the results of applying the proposed methodology while section (V) concludes.

The second part of the paper, given in the form of annexes 1-3, provides the theoretical underpinnings and the methodology adopted to reach the presented results. As such, Annex (1) outlines the standard framework used in the relevant literature on intergovernmental transfers. Annex (2) gives the methodology adopted to develop a transparent mechanism for the allocation of equalization grants. Annex (3) provides the proposed formula that is applied to estimate GDP at State level.

II. Some Background Information:

2.1. GDP at the State Level:

As is probably well known there is a serious data problem in Sudan, especially with respect to information regarding GDP at the level of states. Recent efforts by UNICEF, the World Bank, the IMF and UNDP have improved our knowledge, but a lot of noise in the data sets compiled by these organizations still exists. As a result resort to indirect methods of estimation is inevitable. Such a method of estimation, shown in Annex 3 of the paper, is used to estimate GDP produced by the various states; and no claim to absolute accuracy is made.

According to the IMF (2007: 20, table 2) GDP in 2005 is estimated as amounting to about 6748 billion Sudanese Dinars (approximately US\$27699 million). With a total population of 35.4 million this gives a per capita GDP for the country of about 190.6 thousand Dinars (US\$783, using an exchange rate of 243.6 Sudanese Dinars to a US\$ as per the IMF). According to UNDP (2006) GDP per capita for Sudan in 2004 is estimated in PPP as US\$1949, corresponding to 161536 Sudanese Dinars and implying a conversion factor of 82.9 Sudanese Dinars to one US\$ in PPP. Using this conversion factor GDP per capita for 2005 would be US\$2299 in PPP.

By a repeated use, and adjustment of the results, of the estimated equation [equation (15) in Annex 3] and the population figures for 2005 we arrived at the estimates for GDP in the northern states as per table (1).

**Table (1):
Estimates of GDP for the Northern States: 2005**

State	IMR (per thousand live births)	Per Capita GDP (US\$ PPP)	Per Capita GDP (Sudanese dinar)	Population (thousand)	GDP (billion Sudanese dinar)
Northern	60	2791	231375	636.48	147.3
Nile	62	2747	227775	991.44	225.8
Red Sea	100	2186	181220	748.68	135.7
Kassala	70	2592	214930	1657.50	356.3
Gedarif	106	2125	176239	1707.48	300.9
Gezira	65	2686	222684	3872.94	862.5
Sinnar	95	2240	185721	1327.02	246.5
White Nile	80	2432	201632	1668.72	336.5
Blue Nile	126	1957	162256	730.32	118.5
Khartoum	65	2686	222684	5664.06	1261.3
N. Kordofan	70	2592	214930	1609.56	345.9
S. Kordofan	93	2263	187621	1197.48	224.7
N. Darfur	75	2508	207953	1688.10	351.0
S. Darfur	84	2376	196981	3234.42	637.1

W. Darfur	95	2240	185721	1768.68	328.5
Total/Average	90*	2299*	190622*	28502.88	6748*

* For the Sudan as a whole.

The table, we suggest, presents reasonable estimates that can further be refined to respect an additivity requirement for the whole of the country, including taking into consideration the contribution of oil to GDP. For illustrative purposes, however, the results confirm the dominating position of Khartoum state in the economy of the country. In the standard framework that uses standardized expenditure and tax ratios the results can be used to generate alternative transfer allocation mechanisms.

2.2. The Human Development Index:

In addressing issues of transparency and fairness in the allocation of federal transfers to sub-national governments, it is usual to search for a reference indicator of development performance. According to the CPA such reference indicator is specified as follows: "**Southern Sudan and those areas in need of construction/reconstruction, shall be brought up to the same average social/economic standard and public services as the Northern States**". This suggests that special weights for deprivation in all social services can be anchored on the average level of social achievements of the Northern States. A relevant, and an MDG consistent, anchor is the Human Development Index. For the various Northern States we computed HDI as per table (2) below. Four indicators are used in the calculation of the HDI: infant mortality rate (denoted IMR; with the Red Sea state recording the worst performance of 116 per thousand; and, Al-Gezira recording the best performance of 43 per thousand); under-5 mortality rate (denoted U5-MR; with Blue Nile recording the worst performance of 172 per thousand; and Al-Gezira recording the best performance of 59 per thousand); life expectancy at birth (denoted LEB; with Blue Nile recording the worst performance of 50.1 years; and Al-Gezira recording the best performance of 58.5 years); and the school enrolment ratio (denoted SER; with Western Darfur recording the worst performance of 21.5 percent; and Northern recording the best performance of 88 percent).

Table (2):

Human Development Index for Northern States

State	IMR Indicator	U-5 MR Indicator	LiEB Indicator	SER Indicator	HDI
Northern	0.8219	0.8319	0.2500	1.0000	0.7259
Nile	0.8082	0.8053	0.9286	0.8632	0.8513
Red Sea	0.0000	0.0619	0.1313	0.3519	0.1362
Kassala	0.2055	0.2124	0.5219	0.2406	0.2956
Gedarif	0.6712	0.4867	0.1786	0.3639	0.4251
Gezira	1.0000	1.0000	1.0000	0.9053	0.9763
Sinnar	0.8904	0.6549	0.5000	0.4977	0.6358
White Nile	0.6301	0.5398	0.7143	0.8226	0.6767
Blue Nile	0.2055	0.0000	0.0000	0.1895	0.0987
Khartoum	0.6438	0.6106	0.9405	0.9218	0.7792
N. Kordofan	0.7671	0.6903	0.5119	0.3774	0.5867

S. Kordofan	0.2877	0.2212	0.6071	0.1970	0.3283
N. Darfur	0.7534	0.6283	0.6786	0.9609	0.7553
S. Darfur	0.7123	0.6726	0.5119	0.2466	0.5359
W. Darfur	0.6164	0.6018	0.5714	0.0000	0.4474

On the basis of the above table the average achievement by states in Northern Sudan relating to health and education, the two most important dimensions of human development, is represented by an average HDI of 0.5888. Given the CPA guiding principle it is suggested that states achieving less than this average be accorded a commensurate weight to reflect their deprivation. Prior to the current Darfur conflict (which started in 2003) the states in question include the Blue Nile, Red Sea, Kassala, Southern Kordofan, Gedarif, Western Darfur, Western Kordofan, and Southern Darfur. We suggest that this identification concurs with our intuitive understanding of regional development marginalization. Needless to note, however, that the HDI could easily be re-calculated at any point in time to reflect the realities on the ground given the availability of data.

III. The Expenditure and Revenue System:

3.1. Current Expenditure:

Until very recently, and despite the decentralization trends in the governance structure of the country, very little detailed statistical knowledge was available regarding the state of expenditure at the level of the Northern States. This is especially true for the functional distribution of whatever observed total expenditure incurred at this level of government. Recently, however, UNICONS Consultancy was able to undertake a compilation exercise, using official State-level data from the Ministry of Finance and National Economy. The compilation is done over the period 2000-2005.

In the original compilation total public expenditure at the level of the state is classified into (a) current expenditure (composed of wages and salaries and goods and services); (b) investment and capital contribution; and (c) development expenditure. Under each item (or possibly chapter) a distinction is made between Ministries and localities in each state. Such classification, we hasten to note, is not the same as that required to reflect functional classification.

Table (3) reports total public expenditure at the level of the states over the period 2000-2005 where the figures between brackets are the share of current expenditure in total expenditure.

**Table (3):
Total Expenditure and the Share of Current Expenditure at the Level of Northern States
(billion dinars and %)**

State	2000	2001	2002	2003	2004	2005
Northern	2.3 (95.8)	3.2 (99.0)	3.5 (96.5)	4.6 (96.7)	9.4 (78.6)	12.9 (75.8)
Nile	4.4 (70.0)	5.3 (87.9)	8.3 (62.5)	6.7 (81.7)	15.2 (59.3)	20.9 (59.6)
Red Sea	3.4 (95.3)	4.2 (82.0)	4.9 (79.1)	5.7 (74.5)	11.1 (74.2)	12.9 (60.0)
Kassala	3.3 (99.6)	3.7 (97.3)	4.2 (96.2)	4.9 (94.6)	7.5 (100)	10.9 (100)
Gedarfif	4.1 (82.6)	5.0 (89.6)	5.7 (91.2)	8.1 (64.1)	10.5 (81.2)	13.9 (73.2)
Gezira	9.9 (95.3)	12.1 (91.7)	15.0 (93.3)	19.6 (92.2)	31.4 (86.4)	40.4 (86.2)
Sinnar	3.4 (94.6)	3.9 (95.4)	4.0 (89.8)	4.4 (90.7)	7.6 (89.9)	10.6 (83.3)
White Nile	3.4 (86.1)	5.0 (80.7)	5.2 (93.2)	6.7 (79.3)	9.9 (82.3)	16.1 (84.0)
Blue Nile	1.9 (89.2)*	2.2 (89.2)	2.6 (86.4)	3.3 (89.6)	5.1 (88.8)	7.0 (88.7)
Khartoum	23.5 (79.0)	31.5 (72.1)	47.6 (60.1)	61.9 (53.6)	90.8 (51.4)	110.7 (52.2)
N. Kordofan	3.3 (97.0)	3.9 (92.1)	4.8 (100)	5.5 (97.3)	9.3 (92.8)	15.2 (90.6)
S. Kordofan	2.1 (93.5)	3.1 (94.2)	3.2 (91.8)	3.6 (91.2)	5.8 (94.6)	9.3 (90.9)
N. Darfur	2.9 (98.8)	3.2 (95.0)	4.3 (96.9)	5.5 (85.9)	8.9 (90.5)	13.0 (87.7)
S. Darfur	3.9 (94.3)	4.1 (93.5)	5.6 (96.4)	5.6 (95.1)	10.4 (70.8)	12.6 (80.9)
W. Darfur	1.6 (100)	2.1 (100)	2.4 (95.3)	2.7 (94.8)	7.5 (98.2)	6.4 (92.6)

Total	73.4 (89.5)	95.1 (87.9)	124.3 (80.9)	152.2 (75.2)	264.1 (68.2)	321 (73.1)
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* imputed.

Over the period under consideration, and despite the variation in the rate of growth for the various states, total public expenditure at the level of the states recorded an increasing trend: from about 73 billion Dinars in 2000 to about 321 billion Dinars in 2005 (recording an annual rate of increase of about 34.3 percent in nominal terms). This is both expected and understandable, given not only population growth but the deepening decentralization process. The share of current expenditure in total expenditure by the states, however, fluctuated at the level of each state. For all of the states taken together there is evidence of a declining trend, especially considering the end points. The last row of the table clearly reports such an overall declining trend from about 90% of total expenditure in 2000 to about 73% in 2005. For the year 2005 the table shows that the share of current expenditure in the total varied from a low of about 52% in Khartoum state (followed by 60% for Nile state) to a high of 100% for Kassala state (followed by about 93% for West Darfur, excluding West Kordofan for which the figures are imputed rather than officially reported).

As noted in the context of the standard framework, the functional structure of current expenditure can be used to derive weights for an allocation formula. Unfortunately a detailed functional classification of current expenditure is not available. However, to get a preliminary idea we looked at the structure of current expenditure from a quasi-functional perspective. This is done on the basis of UNICONS compilation where we were able to identify six categories of expenditure: administration, agriculture, education, health, social affairs and urban. A seventh category on "localities" is excluded. To smooth the fluctuations over time, we computed the average of averages over the six years period for each of the identified categories. The results of the exercise are given in table (4) below, where we provide the most important descriptive statistics.

**Table (4):
The Structure of Current Expenditure at the Level of the States
(average percentage shares 2000-2005)**

Expenditure Item	Mean	Standard Deviation	Median	Minimum	Maximum
Administration	45.02	2.84	44.34	24.63 (S. Darfur)	62.59 (S. Kordofan)
Agriculture	5.82	0.52	5.30	2.80 (Khartoum)	9.89 (S. Darfur)
Education	18.36	5.76	18.17	7.93 (S. Kordofan)	29.49 (Gezira)
Health	20.83	7.81	22.19	2.80 (Khartoum)	29.17 (Kassala)
Social Affairs	3.74	1.63	3.45	1.52 (White Nile)	6.88 (River Nile)
Urban	4.85	2.44	4.54	1.84 (N. Kordofan)	10.18 (Khartoum)

It is significant to note that the structure of the current budget is almost identical when judged either by the mean or the median of the averages. Thus, on average, about 45% of the current budget at the state level is spent on administration (ranging from a low of about 23% for South

Darfur to a high of about 63% for South Kordofan). This is followed by expenditure on health that accounts for about 21% of current expenditure (ranging from a low of about 3% for Khartoum to a high of about 29% for Kassala). The third highest category of current expenditure is education accounting for an average of about 18% (ranging from a low of about 8% for South Kordofan to a high of about 30% for Gezira).

3.2. Revenue Capacity:

Fairly detailed information on own revenues at the level of the Northern States can be found in annual reports produced by the Taxation Chamber. On the basis of such official reports UNICONS was able to undertake a compilation exercise, using official Ministry of Finance and National Economy files. The compilation is done over the period 2000-2005. Total revenue at the disposal of sub-national state governments is composed of two major components: own revenue and federal transfers. Federal transfers include, as the case may be, current support, development support, value added tax, compensation for agricultural tax, and additional support. Own revenue is classified in the usual manner of tax revenue (transferred taxes, animal tax and excise duties as the case may be) and non-tax revenue (departmental fees, service charges, local revenues as the case may be). Table (5) reports own revenues in billion Sudanese dinars and the share in total revenues between brackets.

**Table (5):
Total Own Revenue and Its Share in Total Revenue at the Level
of Northern States (billion dinars and %)**

State	2000	2001	2002	2003	2004	2005
Northern	1.4 (61.2)	1.1 (35.0)	1.4 (40.5)	1.5 (34.6)	3.3 (37.6)	12.4 (36.9)
Nile	3.0 (69.2)	2.4 (48.1)	4.2 (50.9)	2.5 (33.2)	8.2 (50.3)	9.0 (45.1)
Red Sea	4.1 (95.5)	5.1 (73.4)	4.3 (70.3)	7.5 (77.4)	7.5 (72.3)	10.4 (72.7)
Kassala	1.9 (62.1)	1.7 (49.1)	1.6 (37.3)	1.9 (38.3)	2.3 (32.8)	2.4 (23.2)
Gedarif	3.5 (92.8)	3.3 (70.7)	2.4 (43.2)	3.8 (48.7)	4.3 (41.1)	4.3 (33.1)
Gezira	3.2 (37.1)	3.0 (27.9)	3.5 (22.8)	4.6 (25.7)	8.8 (27.1)	11.9 (28.9)
Sinnar	1.7 (60.6)	2.1 (52.9)	1.4 (36.1)	1.2 (29.7)	2.0 (27.8)	3.3 (32.3)
White Nile	3.3 (96.5)	2.0 (45.7)	2.4 (49.6)	3.5 (51.7)	3.3 (34.4)	6.3 (41.0)
Blue Nile		0.6 (27.0)	0.4 (15.4)	0.7 (20.0)	1.0 (19.1)	1.0 (15.7)
Khartoum	23.6 (100)	31.7 (100)	44.2 (100)	43.9 (69.9)	61.5 (67.1)	78.9 (69.0)
N. Kordofan	2.3 (62.1)	1.8 (46.4)	1.9 (42.5)	2.4 (38.0)	3.1 (37.5)	3.9 (24.8)
S. Kordofan	0.7	0.9	0.7	1.8	1.5	1.6

	(29.7)	(29.5)	(24.2)	(48.1)	(26.3)	(16.7)
N. Darfur	1.7 (67.4)	1.3 (38.0)	1.5 (26.8)	1.4 (23.8)	1.4 (17.2)	1.3 (10.9)
S. Darfur	2.7 (72.7)	2.9 (66.7)	2.8 (53.2)	3.0 (47.6)	3.7 (44.9)	4.6 (39.6)
W. Darfur	0.9 (53.7)	1.0 (46.5)	0.7 (26.4)	0.5 (15.7)	4.7 (61.7)	1.0 (16.6)
Total	54.0	60.9	73.4	80.2	116.6	152.3

The table shows that own revenue recorded an increase over the period under consideration from about 54 billion Dinars in 2000 to about 152 billion Dinars in 2005. However looking at 2005 it is perhaps clear that eight of the states have very low revenue capacity of less than 5 billion Dinars and that Khartoum dominates the revenue scene accounting for about 52% of total own revenue. This is perhaps an important feature to bear in mind in designing a transparent and fair system of federal transfers. Another important feature is that among the states having a revenue capacity in excess of 5 billion Dinars is the Red Sea. Given the already reported results on HDI this is a highly surprising result!

3.3. Federal Transfers:

As noted above total revenue for each state is reported on the basis of tax and non-tax revenue in addition to federal transfers. Over the period 2000-2005 we have details on such transfers by state. These are reported in table (6) where figures between brackets are the share of federal transfers in total state revenue.

**Table (6):
Federal Transfers and their Share in Total Revenue at the Level of Northern States (billion dinars and %)**

State	2000	2001	2002	2003	2004	2005
Northern	0.9 (38.7)	2.0 (65.0)	2.1 (59.5)	2.9 (65.4)	5.6 (62.5)	4.1 (63.2)
Nile	1.3 (30.8)	2.6 (51.9)	4.1 (49.2)	5.0 (66.8)	8.1 (49.7)	11.0 (54.9)
Red Sea	0.2 (4.5)	0.8 (14.2)	1.8 (29.7)	2.2 (22.6)	2.9 (27.7)	3.9 (27.3)
Kassala	1.2 (38.1)	1.8 (50.9)	2.6 (62.7)	3.1 (61.7)	4.7 (67.2)	7.9 (76.8)
Gedarif	0.3 (7.2)	1.4 (29.3)	3.1 (56.8)	4.0 (51.3)	6.2 (58.9)	8.6 (66.9)
Gezira	5.5 (62.9)	7.8 (72.1)	11.9 (77.2)	13.2 (74.3)	23.6 (72.9)	29.2 (71.1)
Sinnar	1.1 (39.4)	1.4 (41.2)	2.5 (63.9)	2.9 (70.3)	5.2 (72.3)	6.9 (67.8)
White Nile	0.2 (3.5)	2.4 (54.3)	2.4 (50.4)	3.3 (48.3)	6.4 (65.6)	9.0 (58.9)
Blue Nile	-----	1.7 (72.9)	2.2 (84.6)	2.7 (80.0)	4.3 (80.9)	5.5 (84.4)

Khartoum	-----	00 (00)	0.1 (2.7)	18.9 (30.1)	30.1 (32.9)	35.4 (31.0)
N. Kordofan	1.4 (37.9)	2.1 (53.6)	2.6 (57.4)	3.9 (62.0)	5.1 (62.5)	11.8 (75.3)
S. Kordofan	1.6 (70.3)	2.1 (70.5)	2.3 (75.8)	2.0 (52.0)	4.2 (73.8)	7.3 (76.5)
N. Darfur	0.8 (32.6)	2.1 (62.0)	4.1 (73.2)	4.2 (76.2)	6.8 (82.8)	10.6 (89.1)
S. Darfur	1.0 (27.4)	1.5 (33.4)	2.4 (46.8)	3.3 (52.4)	4.5 (55.1)	7.0 (60.4)
W. Darfur	0.8 (46.3)	1.2 (53.5)	1.8 (73.6)	2.4 (84.3)	2.9 (38.3)	5.2 (83.4)
Total	10.5 (15.6)	21.7 (24.7)	46.0 (39.1)	74.0 (48.5)	120.6 (50.9)	163.4 (52.3)

Despite the fluctuations in the percentage share of federal transfers in total state revenues for each state over the period under consideration the last row of the table shows that there is a clear increasing trend. The share of federal transfers increased from about 16% of total revenue in 2000 to about 52% in 2005. This share also varied across states. Thus, for example, in 2005 the share of federal transfers ranged from a low of 27% for the Red Sea state (followed by 31% for Khartoum state) to a high of 89% for North Darfur (followed by 84% for the Blue Nile state). Such variability is, of course, understandable given the factors involved in the revenue mobilization and budget making processes. What is puzzling are the states involved at the two ends of the distribution.

To further understand the current structure of federal transfers it may be appropriate to look at the actual fiscal gaps that federal transfers are supposed to fill. Table (7) provides information on the federal transfers and fiscal gaps for the year 2005. No information is provided for West Kordofan. The column on federal transfers also reports the share of each state in total transfers.

**Table (7):
Fiscal Gap and Federal Transfers in Northern States 2005 (billion Dinars)**

State	Total Expenditure	Own Revenue	Fiscal Gap	Federal Transfers	Federal Transfers/Fiscal Gap (%)
Northern	12.9	12.4	0.5	4.1 (2.51)	820.0
Nile	20.9	9.0	11.9	11.0 (6.73)	92.4
Red Sea	12.9	10.4	2.5	3.9 (2.39)	156.0
Kassala	10.9	2.4	8.5	7.9 (4.84)	92.9
Gedarif	13.9	4.3	9.6	8.6 (5.26)	89.6
Gezira	40.4	11.9	28.5	29.2 (17.87)	102.5
Sinnar	10.6	3.3	7.3	6.9 (4.22)	94.5

White Nile	16.1	6.3	9.8	9.0 (5.51)	91.8
Blue Nile	7.0	1.0	6.0	5.5 (3.37)	91.7
Khartoum	110.7	78.9	31.8	35.4 (21.67)	111.3
N. Kordofan	15.2	3.9	11.3	11.8 (7.22)	104.4
S. Kordofan	9.3	1.6	7.7	7.3 (4.47)	94.8
N. Darfur	13.0	1.3	11.7	10.6 (6.49)	90.6
S. Darfur	12.6	4.6	8.0	7.0 (4.28)	87.5
W. Darfur	6.4	1.0	5.4	5.2 (3.18)	96.3
Total	312.8	152.3	160.5	163.4 (100)	101.8

The table shows that in the 2005 budget all states reported a fiscal gap that ranged from a low of 0.5 billion Dinars for the Northern state to a high of 31.8 billion Dinars for Khartoum state. The actual federal transfers ranged from a low of 3.9 billion Dinars for the Red Sea state to a high of 35.4 billion Dinars for Khartoum. The last column shows that these federal transfers aimed at exactly meeting the fiscal gap of each state except for the Northern, Red Sea, Khartoum, Northern Kordofan and Gezira states where the transfers were more than the indicated fiscal gap. Noteworthy in this respect is the coverage for the Northern state where the federal transfers were 820 percent of the reported fiscal gap. At the other extreme, the lowest coverage of the fiscal gap is recorded for South Darfur state (about 88% of the fiscal gap) and Gedarif and North Darfur (about 90% of the fiscal gap).

IV. Implementing the Framework: Preliminary Results:

It will be recalled that FFAMC is to “ensure **the transparency and fairness** in regard to the allocation of nationally collected funds to the Government of Southern Sudan and the states”, and to “(a) **monitor and ensure** that equalization grants from the National Revenue Fund are promptly transferred to respective levels of government, (b) **guarantee appropriate utilization and sharing** of financial resources, (c) ensure that revenues allocated to conflict affected areas are transferred in accordance with agreed formula, (d) **safeguard transparency and fairness** in the allocation of funds to the Government of Southern Sudan and the states according to established ratios or percentages stipulated in this Constitution”. All of the highlighted functions require information on expenditure needs and revenue capacity at all levels of government.

Be the above as it may, recalling the 45 exclusive executive and legislative powers of the states enumerated by the INC in schedule (C), and without loss in generality, and from the perspective of looking at the expenditure needs, these exclusive powers can be classified in seven broad expenditure categories: primary and secondary education (power 22 in schedule C: “primary and secondary schools and education administration in regard thereto”); health care (power 15: the establishment, regulation, and provision of health care, including hospitals and other health institutions); social welfare (power 5: “social welfare including state pensions”); administration (powers 3, 6, 12, 37, 41, 42, 44-45); law and order (powers 2, 7, 14, 19, 20, and 34); economic development (powers 8, 16, 17, 21, 23, 24, 25, 31, 32, and 36); and, a remainder category which we can call ‘others’, to include the rest of the powers.

Detailed information on the above categories of expenditure at the level of the states is not currently available. As reported in section (III) the best available information is a recent compilation of expenditure data at such level undertaken by UNICONS based on the files of the final accounts submitted to the Ministry of Finance and National Economy. These, however, are not found to be helpful. As an alternative, information from the federal level could be used. For 2003, Ahmed et al (2004: 27, table 7) provided such functional classification of government expenditure. Table (5) provides a summary of this information according to the categories identified above, after excluding “transfers to the States” which amounted to about 61.7 billion Dinars, representing 8.4% of total expenditure (which amounted to 735.9 billion Dinars).

Table (8):

Actual Federal Government Expenditure by Function for 2003

Expenditure Category	Amount (billion Dinars)	Percentage of total (%)	Amended amount (billion Dinars)	Share in Total Expenditure (%)
Education	32.2	4.8	32.2	12.0
Health	10.5	1.6	10.5	3.9
Social Welfare	26.0	1.3	26.0	9.7
Administration	33.6	5.0	33.6	12.5
Law and order	158.0	23.4	49.3	18.4
Economic development	164.6	24.4	57.5	21.4
Other	249.3	37.0	59.1	22.0
Total	674.2	100.0	268.2	100.0

Source: compiled from Ahmed et al (2004: table 7).

Though useful the original percentages of federal expenditure categories are dominated by “defense and security”, which appears under our category “law and order”, (with a share of 23.4% of total expenditure); “agricultural and industrial production”, plus “infrastructure”, but excluding “social subsidies”, which appear as a consolidated category of “economic development” (with a consolidated share of 24.4% of total expenditure); and the category “other”, which in the original classification is called “miscellaneous”, which accounts for 37% of total expenditure. This category includes “reserves for wages and salaries”, “external and internal debts”, “centralized obligations”, and “pensions and social security” (which is moved to social welfare in our classification). The amount for the categories “education”, “health”, and “administration” appear in the above table as in the original.

Obviously all of the above noted dominant categories need to be adjusted so that normal per capita expenditure can be derived. This is done in the above table where we kept the original amounts for education, health, social welfare, and administration as in the original actual expenditure. The original “defence and security category” is adjusted to reflect the relevant “law and order” category by first netting out the cost of the civil war. According to estimates by various quarters the daily cost of the civil war was about US\$1 million, which works out as 91.3 billion Sudanese Dinars per year. The remainder of the original category is about 66.7 billion Dinars. Under the original category about 74% of the expenditure was on wages and salaries,

while the remainder was on goods and services. Given the dominance of the military hardware in the goods and services item, we use the wages and salaries share on the remainder of the original category to estimate the quasi-normal expenditure on law and order. This works out as about 49.3 billion Sudanese Dinars. This is the figure that appears in the adjusted column. The total of the adjusted column is about 39.8% of total current expenditure at the federal level. This share of normal expenditure in total federal expenditure can be used to estimate a country wide average per capita expenditure to be applied as per equation (6).

According to the IMF (2006: 22, table 4) total current expenditure for 2005 amounted to 1383 billion Dinars. Applying the above share of normal expenditure in total federal expenditure to 2005 gives rise to per capita expenditure of **15549** Sudanese Dinars. Needless to note that the estimated per capita expenditure needs to be repeatedly adjusted by a relevant factor so as to equate the estimated sum of entitlements to the observed sum of actual expenditure at the level of the states.

Regarding revenue capacity we note that with the advent of oil in 1999 the structure of revenue in the country has changed dramatically. According to the IMF (2006: 22 table 4) in 2005 oil revenue accounted for about 67% of total government revenue (which amounted to 1473 billion Dinars). The remainder of the revenue comprised of tax revenue and departmental fees amounted to about 487 billion Dinars. This implies that national revenue per capita is about **13757** Dinars. This is the reference revenue that will be used in the calculations as appropriate (as per equation 7). As we did with expenditure this reference revenue will be repeatedly adjusted by a relevant factor so as to equate the estimated sum of revenues with the observed sum of actual revenue.

Having noted the above, a first result to report is that the current system of fiscal transfers is not based on population weights. This result is clearly reflected in table (7) above. It is, however, a surprising result. The table below reports the result for 2005.

Table (9):

Federal Transfers to Northern States 2005

State	Fiscal Gap (billion Dinars)	Federal Transfers (billion Dinars)	Per Capita Federal Transfers (Dinars)	Federal Transfers (%)	Population (thousand)	Population (%)
Northern	0.5	4.1	6442	2.51	636.48	2.23
Nile	11.9	11.0	11095	6.73	991.44	3.47
Red Sea	2.5	3.9	5209	2.39	748.68	2.62
Kassala	8.5	7.9	4766	4.84	1657.50	5.82
Gedarif	9.6	8.6	5037	5.26	1707.48	6.00
Gezira	28.5	29.2	7540	17.87	3872.94	13.59
Sinnar	7.3	6.9	5200	4.22	1327.02	4.66
White Nile	9.8	9.0	5393	5.51	1668.72	5.86
Blue Nile	6.0	5.5	7531	3.37	730.32	2.56
Khartoum	31.8	35.4	6250	21.67	5664.06	19.87
N. Kordofan	11.3	11.8	7331	7.22	1609.56	5.65
S. Kordofan	7.7	7.3	6096	4.47	1197.48	4.20
N. Darfur	11.7	10.6	6279	6.49	1688.10	5.92
S. Darfur	8.0	7.0	2164	4.28	3234.42	11.35
W. Darfur	5.4	5.2	2940	3.18	1768.68	6.21
Total	160.5	163.4	5991	100	28502.76	100

The table shows that seven states enjoyed shares in federal transfers that exceeded their corresponding population shares (Northern, Nile, Gezira, Blue Nile Khartoum, North Kordofan, South Kordofan, and North Darfur), while the remaining seven states suffered from having shares less than their population shares. Perhaps the most striking example of the first group is the Nile state which received a federal transfer share of almost double its population share, followed by Gezira. The remaining five states had marginal gaps. At the other extreme is South Darfur which received a share of federal transfers which is about 38% of its population share followed by West Darfur with a transfer share of about 49% of its population share.

Now, suppose, as per the requirement of the CPA, we take own revenue as given and impose the constraint that observed total expenditure at the level of the states be equally distributed such that people enjoy the same level of social services. On the basis of observed per capita expenditure for 2005 we may use equation (10) to calculate the equally distributed equivalent level of per capita expenditure. With an inequality aversion parameter of 2 we calculate this level of expenditure to be **8022** Sudanese Dinars. Multiplying this by the population of each state we get the equally distributed equivalent current expenditure for each state. As it happened the total expenditure resulting from this procedure amounted to 238.6 billion Dinars. To arrive at the observed total expenditure of 312.8 billion Dinars we adjusted the results by a factor of 1.31. The result is reported in table (10).

**Table (10):
Equally Distributed Equivalent Expenditure and Required Federal Transfers in Northern States 2005 (billion Dinars)**

State	Population (thousand)	Equally Distributed Equivalent Expenditure (billion Dinars)	Adjusted Equally Distributed Equivalent Expenditure (billion Dinars)	Own Revenue (billion Dinars)	Required Federal Transfers (billion Dinars)	Actual Federal Transfers (billion Dinars)
Northern	636.48	5.1	7.0	12.4	-5.4	4.1
Nile	991.44	8.0	10.9	9.0	1.9	11.0
Red Sea	748.68	6.0	8.2	10.4	-2.2	3.9
Kassala	1657.50	13.3	18.2	2.4	15.8	7.9
Gedarif	1707.48	13.7	18.7	4.3	14.4	8.6
Gezira	3872.94	31.1	42.5	11.9	30.6	29.2
Sinnar	1327.02	10.7	14.6	3.3	11.3	6.9
White Nile	1668.72	13.4	18.3	6.3	12.0	9.0
Blue Nile	730.32	5.9	8.1	1.0	7.1	5.5
Khartoum	5664.06	45.4	62.1	78.9	-16.8	35.4
N. Kordofan	1609.56	12.9	17.6	3.9	13.7	11.8
S. Kordofan	1197.48	9.6	13.1	1.6	11.5	7.3
N. Darfur	1688.10	13.5	18.5	1.3	17.2	10.6
S. Darfur	3234.42	26.0	35.5	4.6	30.9	7.0
W. Darfur	1768.68	14.2	19.4	1.0	18.4	5.2
Total	28502.88	238.6	312.8	152.3	160.5	163.4

Comparing the last two columns it is clear that the current system is not based on an equally distributed concept of federal transfers. If such a concept is adopted three of the states will not be receiving transfers in view of their relatively high revenue capacity. These states are Northern (with a fiscal surplus of 5.4 billion Dinars), Red Sea (with a surplus of 2.2 billion Dinars), and Khartoum (with a surplus of 16.8 billion Dinars). Although under the current system all states received federal transfers Khartoum state received a staggering 35.4 billion Dinars (almost 22% of the total). Under the equally distributed equivalent expenditure assumption a number of marginalized states would be receiving much higher amounts of transfers compared to the existing system. Notable among these are South Darfur (with a huge entitlement of about 31 billion Dinars), West Darfur (18 billion), North Darfur (17 billion), Kassala (about 16 billion), Gedarif and North Kordofan (14 billion each), White Nile (12 billion), South Kordofan (11.5 billion), and Sinnar (11 billion). Indeed under this assumption all states, except the Nile state, will be receiving Federal transfers which are much higher than what the current system gives them.

We are now in a position to look at a federal transfer system that respects the development stage of each state as reflected in the human development index. If transfers are to reflect the inequality concerns of the INC and the CPA then expenditure needs for each state will need to be adjusted according to a factor related to an equally distributed equivalent development achievement as per equation (12). Such adjustment will necessarily imply increased expenditure. Similarly, adjusted

standardized revenue, as per equation (), will imply increased revenue capacity. The result of this exercise is reported in table (11).

**Table (11):
Equally Distributed Adjusted Standardized Expenditure and Revenue in Northern States
2005**

State	Population (thousand)	Standardized Expenditure (billion Dinars)	HDI Ratio	Adjusted Standardized Expenditure (billion Dinars)	Standardized Revenue (billion Dinars)	Inverse HDI Ratio	Adjusted Standardized Revenue (billion Dinars)
Northern	636.48	9.90	0.66	6.53	8.77	1.51	10.08
Nile	991.44	15.42	0.56	8.64	13.67	1.77	18.42
Red Sea	748.68	11.65	3.53	41.09	10.32	0.28	2.20
Kassala	1657.50	25.77	1.63	42.01	22.85	0.62	10.78
Gedarif	1707.48	26.55	1.13	29.99	23.52	0.88	15.75
Gezira	3872.94	60.22	0.49	29.51	53.37	2.03	82.45
Sinnar	1327.02	20.63	0.76	15.68	18.29	1.32	18.37
White Nile	1668.72	25.96	0.71	18.42	23.01	1.41	24.69
Blue Nile	730.32	11.33	4.86	55.11	10.60	0.21	1.70
Khartoum	5664.06	88.07	0.62	54.60	78.05	1.62	96.22
N. Kordofan	1609.56	25.04	0.82	20.53	22.18	1.22	20.59
S. Kordofan	1197.48	18.62	1.46	27.19	16.51	0.68	8.55
N. Darfur	1688.10	26.25	0.64	16.80	23.27	1.57	27.80
S. Darfur	3234.42	50.30	0.90	45.27	44.57	1.12	37.99
W. Darfur	1768.68	27.50	1.07	29.43	24.37	0.93	17.24
Total	28502.88	443.20	---	440.82	392.80	-----	392.83

As is clear from the above table adjusted standardized expenditure is about 443 billion Dinars while adjusted standardized revenue is about 393 billion Dinars indicating that overall there will be a need for federal transfers. A fair distribution of these transfers can be calculated based on the above information as per table (12) below.

**Table (11):
Adjusted Standardized Expenditure and Revenue in Northern States 2005**

State	Population (thousand)	Adjusted Standardized Expenditure (billion Dinars)	Adjusted Standardized Revenue (billion Dinars)	Required Fiscal Transfers (billion Dinars)	Actual Federal Transfers (billion Dinars)
Northern	636.48	6.53	10.08	-3.55	4.1
Nile	991.44	8.64	18.42	-9.78	11.0
Red Sea	748.68	41.09	2.20	38.89	3.9
Kassala	1657.50	42.01	10.78	31.23	7.9
Gedarif	1707.48	29.99	15.75	14.24	8.6
Gezira	3872.94	29.51	82.45	-52.94	29.2
Sinnar	1327.02	15.68	18.37	-2.69	6.9
White Nile	1668.72	18.42	24.69	-6.27	9.0
Blue Nile	730.32	55.11	1.70	53.41	5.5
Khartoum	5664.06	54.60	96.22	-41.62	35.4
N. Kordofan	1609.56	20.53	20.59	-0.06	11.8

S. Kordofan	1197.48	27.19	8.55	18.98	7.3
N. Darfur	1688.10	16.80	27.80	-11.00	10.6
S. Darfur	3234.42	45.27	37.99	7.28	7.0
W. Darfur	1768.68	29.43	17.24	12.19	5.2
Total	28502.88	440.82	392.83	48.31	163.4

The table shows that a federal transfer system that is based on standardized per capita expenditures and revenues across states and taking into account the development achievements of the various states compared to an equally distributed achievement would result in a completely different pattern of federal transfers from the existing system. As the table clearly shows, such a system will identify eight surplus states (Northern, Nile, Gezira, Sinnar, W. Nile, Khartoum, N. Kordofan, and N. Darfur). Only six states deserve to receive federal transfers in order to meet their standardized expenditure needs (Red Sea, Kassala, Gedarif, Blue Nile, South Kordofan, South Darfur, and West Darfur). The identified states accord with our intuitive understanding of the "marginalized" areas of the country. This implies that the proposed framework is potentially endowed with **the required transparency feature as per the INC and the CPA**.

For the states identified as deserving federal transfer, the calculated amounts of required federal transfers are much higher than the observed amounts. They range from a high of about 53 billion for Blue Nile to a low of 7.3 billion for South Darfur. Overall, given the increased expenditure estimates, total required transfers amount to 176 billion Dinars. This is slightly higher than the observed transfers of 163 billion Dinars. The implied allocation of these transfers among deserving states also accords with our intuitive understanding of their development achievements. This implies that the proposed framework is potentially endowed with **the required fairness feature as per the INC and CPA**. If cross transfers between surplus and deficit states are allowed, it can easily be ascertained that the net required federal transfers will amount to about 48 billion Dinars.

V. Instead of a Conclusion: Guidelines for Future Steps:

As noted above, the FFAMC is charged with a number of important functions in the context of igniting a broadly defined development process in the country anchored on "poverty reduction" in a democratic society. FFAMC is to "ensure the transparency and fairness in regard to the allocation of nationally collected funds to the Government of Southern Sudan and the states", and to "(a) monitor and ensure that equalization grants from the National Revenue Fund are promptly transferred to respective levels of government, (b) guarantee appropriate utilization and sharing of financial resources, (c) ensure that revenues allocated to conflict affected areas are transferred in accordance with agreed formula, (d) safeguard transparency and fairness in the allocation of funds to the Government of Southern Sudan and the states according to established ratios or percentages stipulated in this Constitution".

Given the guiding principles spelt out clearly in the INC and noted in the introduction, we argued that a transparent and fair system of federal transfers can be based on the concept of the equally distributed equivalent development achievements. We have shown that such a system will give rise to expenditure entitlements and revenue responsibilities which are markedly different from the current observed system. We were able to demonstrate this major result for 2005, despite the paucity of data. The following guidelines are meant to assist FFAMC in refining its approach to establish the required transparent and fair system of federal transfers:

- (i) Data compilation: it needs to be reiterated that any **transparent system** for federal transfers will depend crucially on the availability of detailed

information on the fiscal variables to be used not only at the level of sub-national jurisdictions but also at the level of the federal government. Thus, FFAMC needs to compile relevant data on a number of important variables, fiscal as well as structural, from the level of the states in collaboration with all government units. It is highly recommended that such data be compiled from official sources already engaged in data collection, and that FFAMC should not get involved in such data collection efforts;

- (ii) given data availability FFAMC should build an in-house capacity for construction of important indicators relevant to its work (such as GDP at the level of the states, resource endowments, infrastructural assets, and HDI), and for building different scenarios and alternative frameworks for federal transfers;
- (iii) given the in-house capacity under (ii) FFAMC should establish a regular forum to interact with stake holders in society by presenting its in-house generated results to a wider audience with the aim of ascertaining the values of society regarding aversion to inequality in the distribution of expenditure entitlements;
- (iv) given the forum in (iii) above FFAMC should be able to interact with policy makers at the level of the states with a view of streamlining budget proposals that will require minimum adjustments at higher levels of the approval process.

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ANNEX 1

The Standard Framework:

As is well known intergovernmental fiscal transfers are required to ensure that revenues roughly match the expenditure needs of various levels of sub-national governments³⁰. In the context of the INC they are required to advance the cause of such principles as fairness, equity and shared development. These fiscal transfers are usually discussed in terms the concepts of vertical and horizontal fiscal gaps. These concepts are derived from the famous social welfare concepts of vertical and horizontal equity. In welfare analysis, vertical equity requires the treatment of those (individuals, states, local governments etc) who are unequal in all relevant circumstances unequally; on the other hand, the principle of horizontal equity requires the treatment of those, who are in all relevant senses, identical identically³¹.

As is probably well known the vertical equity objective in the context of taxation has been related to the concept of the ability to pay. The most famous approach in this respect is the utilitarian one where the social welfare function is the sum of the utilities of individuals (here states) defined on fixed pre-tax incomes. Maximizing social welfare requires that after tax incomes be equalized³².

According to Shah (2006) a “vertical fiscal gap is defined as the revenue deficiency arising from a mismatch between revenue means and expenditure needs”, typically at lower levels of government (e.g. states, local councils etc). Such a vertical fiscal gap may arise due to inappropriate assignment of spending responsibilities; centralization of taxing powers; tax competition by sub-national levels of government; and, heavy tax burdens imposed by a central government.

The standard framework for transfers is based on revenue capacities and expenditure needs (see, for example, Ahmed, Singh and Fortuna (2004), and Ahmed and Searle (2005)). For a country with m regions the formula is derived from an identity defining entitlement to transfers, T_i , as the difference between standard public expenditure needs, E_i , and the sum of standard revenue capacity, R_i , and other transfers (e.g. specific purpose transfers), Z_i (Ahmed, Singh and Fortuna (2004)). The identity in question could be written as:

$$(1) \quad T_i \equiv E_i - R_i - Z_i$$

The identity requires the central government transfer “to cover the difference between each region’s standard expenditure needs and revenue capacity, to ensure that a region with standard tax effort will be able to provide a standard level of public services”. Note that the sum of entitlements in the identity over all states may or may not be equal to the available pool of resources that can be shared among states, B . This observation requires adjusting actual transfers, AT_i proportionately according to the size of the available pool of resources as follows:

³⁰ For a crisp summary of the early literature on the economics of fiscal federalism see Elshibly (1990: 4-16).

³¹ See, for example, Atkinson and Stiglitz (1980: 350- 356).

³² In his famous textbook Musgrave (1959: 160) notes that in the context of taxation the “requirements of horizontal and vertical equity are but different sides of the same coin. If there is no specified reason for discriminating among unequals, how can there be a reason for avoiding discrimination among equals”. But, see, Atkinson and Stiglitz (1980).

$$(2) AT_i = [B / \sum_i T_i] T_i$$

To make the above formula operational there is a need to calculate (or estimate) standard revenue capacity and standard expenditure needs.

Depending on the availability of detailed information for sub-national governments a possible way of measuring revenue capacity is to calculate the revenue that could be raised in the region (or state) if the sub-national government taxes all the standard tax bases, X_{ij} , with a standard tax rate on the j^{th} tax base, τ_j (= national average effective tax rate). Thus, we have the standard revenue capacity of any state defined by:

$$(3) R_i = \sum_j \tau_j X_{ij}$$

Note that the use of the national average effective tax rate is recommended in place of the region's own effective tax rate in order to ensure that "regions with a high tax effort are not penalized and regions with a low tax effort are not rewarded".

As is probably clear, the method requires the availability of detailed and accurate information on major tax bases at the level of regions. Such information is not expected to be available in developing countries. As a result a number of alternative calculation methods, albeit all indirect, are available in the literature. These methods, in turn, require the estimation of a relationship between revenue capacity and economic activity indicators such the GDP of the region (usually problematic in developing countries and may not be available), personal income or possibly total consumption expenditure (both being problematic with consumption expenditure proving to be a more accurate reflection of welfare), and total sales in the region.

In this standard framework expenditure needs are estimated (or calculated) on the basis of standardized expenditure weights and multipliers for various expenditure categories (e.g. education, health, social welfare, government administration, law and order, economic development etc). It turns out that the expenditure weights are based on the age structure of the population. The standard expenditure multipliers are derived from the actual expenditure under each category as a share of total expenditure.

In the absence of detailed information on population age structure the standard framework could simply be based on population. Thus, for example, if $\beta_i = N_i/N$ is used to denote the share of the population of the i^{th} state in total population, α_k is the share of the k^{th} category in total expenditure, then the standard expenditure need of the i^{th} state in the k^{th} category is given by E_{ik} as follows:

$$(4) E_{ik} = \alpha_k \beta_i E$$

The total standard expenditure needs of the i^{th} state is the summation over the k categories of expenditure as follows:

$$(5) E_i = \sum_k E_{ik} = \sum_k \alpha_k \beta_i E = \beta_i E \sum_k \alpha_k = \beta_i E$$

This pure population based calculation is the result of the fact that the shares of the various expenditure categories sum to unity.

Even under this standard framework special needs, constitutionally mandated or otherwise, can be handled through social welfare weights attached to standard and special needs.

A less demanding proposal to estimate equalization grants is given by Ahmed and Searle (2005: 15-16). Estimating expenditure needs and revenue capacity is based on the average at the level of the country as a whole (i.e. overall per capita expenditure and overall per capita revenue) with appropriate adjustments. Thus, we have expenditure needs given by:

$$(6) E_i = N_i [E/N].v_i ,$$

where (E/N) is the average expenditure standard in the country and v_i is a term representing a number of independent factors relevant to the i^{th} state. Specifically it is proposed that v_i should take into account such factors as the differential coverage of the population eligible for services relative to the total population, differential costs arising out of scale factors leading to lower costs, differential costs arising out of concentration or dispersion of eligible population, and differences in cost arising out of social, physical and economic. Revenue capacity is defined in a similar fashion to be as follows:

$$(7) R_i = N_i [R/N].r_i$$

where $[R/Y]$ is the per capita revenue at the level of the country and r_i is the differential revenue raising capacity of the i^{th} region defined in terms of per capita income (or wealth) of the region relative to that of the country.

ANNEX 2

Methodology:

The above standard framework, it can easily be argued, could be applied for countries enjoying normal circumstances. Countries emerging from conflicts, where grievances are expressed in terms of a marginalization discourse, need to be treated in a different fashion albeit respecting the identities between required expenditures and own revenue capacities of the constituent sub-national levels of government. The INC guiding principles for the equitable sharing of resources and common wealth, quoted in the introduction, accord equity a high priority in intergovernmental transfer of resources. Further, according to the CPA **"Southern Sudan and those areas in need of construction/reconstruction, shall be brought up to the same average social/economic standard and public services as the Northern States"**. An MDG consistent indicator of the average social/economic standard of public services is the Human Development Index (HDI)³³.

To account for these constitutional guiding principles it is suggested that perhaps the best approach is to base the shares of the various States out of the total transfer funds on the concept of "equally distributed equivalent development achievements"³⁴. The underlying concept was first developed in the context of finding an inequality measure based on an explicit welfare function. As such, therefore, the "development achievement" in question is the per capita income³⁵. In its original formulation the "equally distributed equivalent income" of a given distribution of total income is defined as "that level of per capita income which if enjoyed by everybody would make total welfare exactly equal to the total welfare generated by the actual income distribution". In technical terms if $W(y_i)$ is used to denote the welfare level enjoyed by the i^{th} individual, y_e , the equally distributed equivalent level of income is given by:

$$(8) \quad n W(y_e) = \sum W(y_i),$$

where n is the number of individuals and the summation is over them. A measure of equality in the distribution involved is given by the ratio of the equally distributed level of income to mean income.

The most widely used form of the individual welfare function is that of constant elasticity. Such a form enables the calculation of the equally distributed equivalent

³³ It will be recalled that the HDI accounts for social and economic achievements in health (measured by life expectancy at birth or any aggregate measure of health); education (measured by a combined school enrolment ratio for the three pre-tertiary level) and per capita income (in its logarithm). The HDI is a simple average of the constituent indicators where for each of the three areas an indicator is calculated as follows: $I_k = [x_k - x_{\min}] / [x_{\max} - x_{\min}]$, where x_k is health, education and income in state k as the case may be; x_{\max} (x_{\min}) the measure for the best (worst) performing state.

³⁴ For an alternative proposal see Elbadawi and Suliman (2006).

³⁵ See Atkinson (1970) and Sen (1997).

attribute in a transparent fashion. Thus, interpreting y as a development achievement we have,

$$(9) \quad W(y) = [y^{(1-\varepsilon)}]/(1-\varepsilon); \text{ for } \varepsilon > 0 \text{ and } \varepsilon \neq 1; \\ = \log y; \quad \text{for } \varepsilon = 1.$$

The marginal utility of this function is given by $W'(y) = y^{-\varepsilon}$, and thus ε is the elasticity of the marginal utility which measures aversion to inequality in society. Higher values of ε reflect increasing aversion to inequality.

Using the definition of the equally distributed equivalent attribute, and the social welfare function, we have:

$$(10) \quad y_e = [1/n \sum y_i^{(1-\varepsilon)}]^{1/(1-\varepsilon)}$$

In what follows, and in view of the fact that we are dealing with states (or regions), equation (10) needs to be adjusted such that it is the population weights that are used. Further, in applying the concept we need to note that the development achievement index is the Human Development Index (HDI). Thus, we have, where β is the population weight of the state or region:

$$(11) \quad HDI_e = [\sum \beta_i HDI_i^{(1-\varepsilon)}]^{1/(1-\varepsilon)}$$

The equally distributed equivalent development achievement can be used to define the adjustment terms in the standard expenditure needs of equation (6) given by v_i , and the standard revenue capacity of equation (7), given by r_i .

For the expenditure adjustment factor an inverse rule is proposed such that we have:

$$(12) \quad v_i = HDI_e / HDI_i$$

Thus the adjustment factor gives more weight to poorer states with an HDI below the equally distributed equivalent development achievement. Such weighting is similar to the inverse, and the distance, rules of per capita income used by the Indian Planning Commissions³⁶. The difference is that (12) takes into account not only per capita income but also achievements in health and education as required by the INC.

The inverse of (12) suggests itself for the adjustment factor for revenue capacity. Interpreting broad development achievements as reflecting not only the narrow tax base of the state as reflected in GDP per capita, but other endowments as well, we have:

³⁶ The inverse rule is given by $[N_i/y_i] / \{\sum N_i/y_i\}$, where y is a measure of per capita domestic product. The distance rule is given by $[(y_h - y_i)N_i] / \{\sum (y_h - y_i)N_i\}$, where y_h is per capita income in the richest state. Note, however, in assigning the richest state a non-zero weight its distance is calculated on the basis of that for the next richest state. This, of course, is both arbitrary and problematic.

$$(13) \quad r_i = \text{HDI}_i / \text{HDI}_e$$

Note that this adjustment requires that states with an HDI higher than the equally distributed equivalent human development achievement are expected to have a higher tax effort per capita. While this seems like a reasonable adjustment factor it not clear why one would adjust observed revenues in such a manner.

ANNEX 3

Calculation of GDP at State Level:

As a result of lack of data on GDP at the State level, it is inevitable that we must resort to indirect methods of estimation. In what follows such a method is used to estimate GDP produced by the various states; and no claim to absolute accuracy is made.

For this purpose we estimated an equation relating the (logarithm of) infant mortality rate (IMR) to that of real per capita GDP (i.e. GDP per capita in US\$ PPP as reported by UNDP (2006: 283-286)). The estimated equation is, where figures between brackets are heteroskedastic consistent t-values, based on a sample of 163 countries for which relevant data was available for 2004:

$$(14) \text{Log IMR} = 4.073 - 0.908 \text{ log } y; R^2 = 0.823$$

(16.9) (32.2)

The justification for using the above equation is that a recent Government of Sudan (2007) reports IMR for all states in Sudan. Using the reported IMR for the country the above estimated equation can be used to obtain the ratio of real per capita GDP in any state to that of the country as a whole as follows:

$$(15) \text{Log IMR}_c - \text{Log IMR}_j = -0.908 [\text{log } y_c - \text{log } y_j] = -0.908 \{\text{log}[y_c/y_j]\}$$

where y_c is the per capita GDP of the country. Note that the left hand side, divided by -0.908, completely determines the logarithm of the ratio on the right hand side. By taking the antilogarithm of the log ratio we get the ratio of the per capita GDPs in question.

Optimum Vertical Transfers for FY 2008

1. **The formula.** An objective formula for estimating the size of transfers to any given state in the federal system can be arrived at through the following process:

- Estimate the average cost of delivering the package of social services and other public goods per person that the state is required to deliver according to the INC, the CPA and the DPA
- Multiply this with the total size of the population of the state to arrive at the total cost of the service delivery for the state (C_i)
- Estimate the own state revenue as a multiple of a tax rate (t) and the income of the state Y_i (where the income at the state level could be estimated by a suitable methodology): $R_i = t \cdot Y_i$
- The required transfers for the state i (T_i) is thus given by cost (C_i) minus own revenues: $R_i = C_i - R_i$
- The total vertical transfers to the 15 Northern States (for example) is given by: $T_N = T_1 + T_2 + \dots + T_{15}$ (and the same applies for the ten southern states)

Comment: it should be noted that the above formula espouses both goals of equity and efficiency: cost of service delivery is equalized for every person in the Sudan no matter where she/he lives in the country; the tax rate is the same across the country; potential own resource mobilization is based on the income level of the state (see the paper by Elbadawi and Suliman for more detailed discussions).

If the allocation to the state understates the costs or exaggerates the own resources, states will be forced to do either or both of two things: under-provide the social services, thus setting back an already difficult MDG situation in Sudan (see the paper by Professor Ali) and/or impose exorbitant taxes on an already heavily-taxed population, thus directly reducing social welfare and productive activities, especially non-oil exports--already at an all time low in an era of oil windfall and explosive government expenditure.

The moral of the proposed formula is that vertical transfers to the state should be equitable, adequate and based on objective criteria and that the budget process should fully reflect these considerations.

2. **Assumptions.** Subscribing to the above, we apply the proposed formula using the average national tax rate and the share of spending on education and health in total expenditure at the sub-national level for some lead reforming African countries.

- Tax rates: the average tax rate for these countries comes to about 15 percent

For comparison, we note that the average national tax rate in Sudan over 1970-2002, as determined from the main tax handles, was about 33 percent. Such high rate, however, tends to encourage tax evasion and avoidance. In our view, given the already high prevailing national tax rate, states should not levy additional rates on the same tax base; instead, the current national tax base should be divided up between the two levels of governments. It should also be noted that high tax rate by itself may not generate high

revenues. Tax compliance, the level of granted tax exemptions and the degree of enforcement of tax law, that is, the fiscal effort are equally important in determining actual revenue collection.

- Expenditure needs per capita: given the recently expanded fiscal mandate of the states, which now includes, in addition to basic education and health, security, higher education and the judicial system, we assume that, on average, 39 per cent of recurrent spending will be needed for the states to meet their fiscal responsibilities: about SDD 6979.6 per person (in fixed 2005 prices). It should be noted that the corresponding actual figure for the FY 2005 was 4580.
- Population and urbanization rates: maintain their growth level, as projected by the CBS, through year 2008.

The own resource mobilization is estimated at 15 percent of the income of the state (Y_i), which is in turn based on the degree of urbanization of the state. According to this criterion the estimated state income in 2008 ranges from Ls. 24200.48 million for Khartoum (the most urbanized) to Ls. 90.72988 million for West Darfur, the least urbanized see table 1.

3. **Simulations.** Using the above assumptions in the above formula, the estimate of the aggregate vertical transfers to the 15 northern states for FY 2008-- consistent with the envisioned, and significantly expanded, state fiscal mandate-- would come to **Ls. 8.3 billion**, in fixed 2005, about **9.78 billion** if expressed in current 2008 prices, assuming 9% annual inflation rate (see table 1).

Though the objective of this input is to contribute an input to the FY 2008 budget process regarding the total vertical net transfers to the 15 northern states, reflecting the views of the FFAMC, the proposed methodology could also provide guidance to other levels of resource allocation within the federal fiscal system:

- Despite the lack of data, the FFAMC should encourage the GOSS to adopt the above criteria for its own allocation to the 10 southern states, using informed guess about the size of state population and rates of urbanization (possibly from NGO estimates ..etc)
- Since the proposed formula is a bottom-up formula, it allows estimation of horizontal allocation between states, which the FFAMC can also take as a guide for assessing its own formula that it currently applies for horizontal allocation. For example, the proposed formula calls for net per capita allocation ranging from: Ls 28.268 for highly urbanized Khartoum to, respectively, Ls 105.1 and Ls 119.519 for sparsely populated Northern and West Darfur states (see Elbadawi and Suliman for full information on this).

4. Concluding Comments:

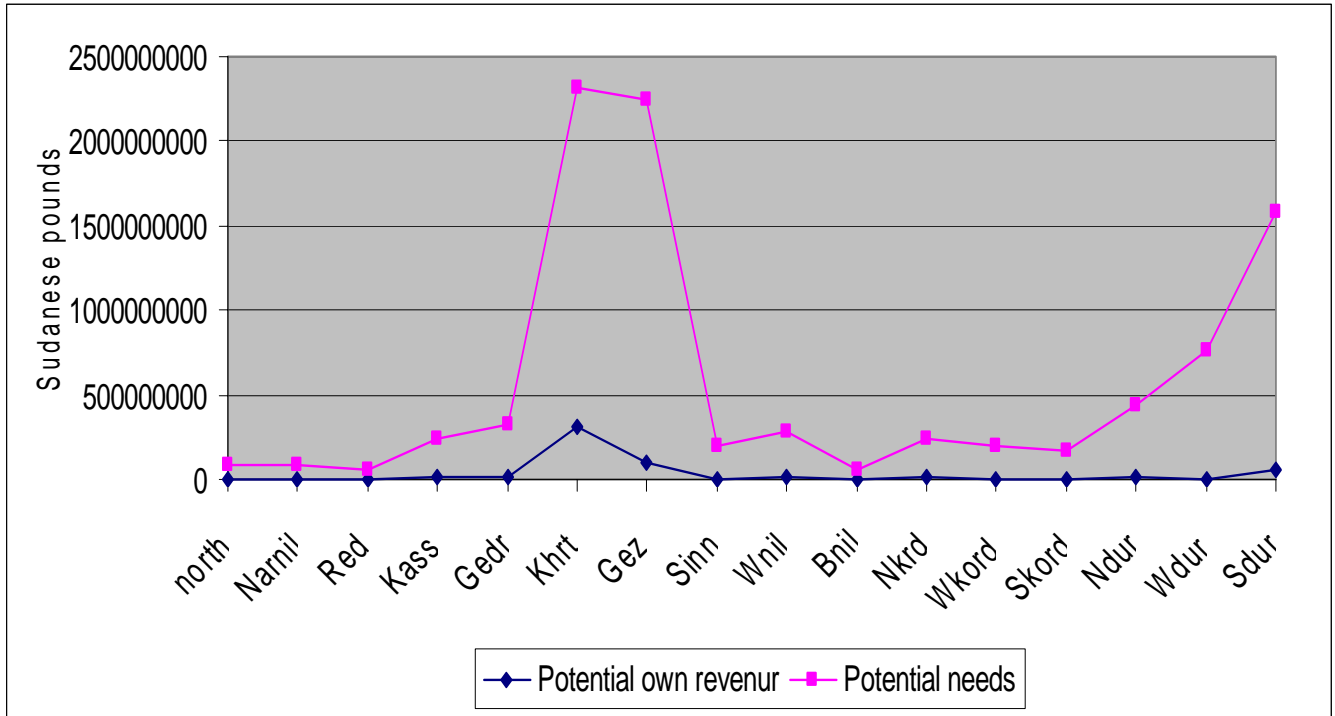
The total revenue for 2007 is about \$9 billion. Transfers to northern states including all (vat, agr taxes, development, and current) amounted to \$ 3 billion (about 33% of revenues).

If we assume growth rate of revenues in 2008 of 12% then total revenues will be \$ billion 10.1 (SDG 20.2 b). Assuming zero inflation (during 2005-08) and applying the formula would lead the very conservative estimate of optimum transfers to the northern states in 2008 of SDG 8.3 billion (or about \$ 4 billion). Therefore, the percentage of transfers to total revenues for the northern states in 2008 will be around 40% compared to 2007 transfers of 33%. This would suggest an increment of only 7%, which should be very measured rise on view of the significantly expanded fiscal mandate of the states in the 2006-08 budgets.

Table (1): Potential Revenue and Potential Needs FY2008

State	Population (In 1000s)	Urban Population (In 1000s)	Potential Own Revenue (in million Ls.)	Potential Needs (in million Ls)	Required Federal Allocation with zero inflation (in million Ls.)	Required Federal Allocation Adjusted for Inflation (in million Ls.)
Northern	624	103	1.0	80.6	81.6	96.9
Nahr Alnil	1012	349	1.0	84.3	85.3	101.3
Red Sea	735	466	0.7	55.9	56.6	67.3
Kassala	1671	598	2.8	220.8	223.6	265.6
Algedarif	1736	507	3.7	297.4	301.1	357.7
Khartoum	5720	4939	23.9	1681.5	1705.4	2026.2
Algezira	3903	914	25.6	2035.6	2061.2	2448.9
Sinnar	1337	387	2.2	179.9	182.1	216.4
W. Nile	1692	552	3.2	251.7	254.9	302.8
B. Nile	729	201	0.7	58.6	59.3	70.4
N. Kordofan	2828	840	5.1	412.3	417.4	495.9
S. Kordofan	1217	318	2.0	161.9	163.9	194.8
N. Darfur	1718	367	5.2	421.3	426.5	506.7
W. Darfur	1783	243	9.0	743.9	752.9	894.5
S. Darfur	3247	726	18.1	1444.7	1462.8	1738.0
Total	29952	11511	104.2	8130.4	8234.6	9783.5

Figure (1): Potential Revenue and Potential Needs FY2008 (based on cols. 5 and 6 table 1)



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