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SUDAN

SELECTED ISSUES

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Approved by Middle East and Central Asia Department

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CONTENTS

TABLES

FIGURES

BOXES

APPENDIXES

APPENDIX TABLES

I. FISCAL COST AND DISTRIBUTIONAL IMPACT OF FUEL SUBSIDIES[1]

This chapter examines the nature of fuel subsidies in Sudan, assesses the fiscal savings generated by the recent increase in fuel product prices and estimates distributional impact of fuel subsidies compared to the pre-reform status quo.

A. Introduction

1. The Sudanese government has increased the price of selected fuel products in the context of the revised 2012 budget, thereby significantly reducing fuel subsidies. Effective June 2012 the price of gasoline has increased from 8.5 to 12.5 SDG per gallon, the price of diesel from 6.5 to 8 SDG per gallon, the price of LPG from 13 to 15 SDG per gallon and the price of jet fuel has been liberalized from the regulated price of 6.5 SDG per gallon, resulting in an increase of about 3 SDG per gallon.[2]

2. A determined subsidy reform was long overdue; petroleum product subsidies have weighed heavily on the budget in the recent past. The lack of an automatic fuel price mechanism, in the context of increasing and volatile international oil prices, has caused fuel subsidies to increase steeply since 2003, when the rally in oil prices began. Petroleum product subsidies accounted for about ¾ of tax revenues in 2011 and have been on the rise as a consequence of the secession of South Sudan and the related loss of oil production. High levels of subsidies are of greater concern in Sudan because competing spending priorities, such as development and social spending, require accurate allocation of public resources.

3. Fuel subsidies are not only fiscally costly, but also inefficient and inequitable; their removal would deliver substantial gains to Sudan:

- *Fuel subsidies magnify the adverse macroeconomic impacts of increasing international prices. Less than full pass-through of international price increases to domestic consumers dilutes their incentives to improve energy efficiency and results in higher import costs.*
- *The high fiscal cost of subsidies crowds out both high-priority public expenditures and private investment. The fiscal cost of price subsidies constrains investment expenditures on key social*

[1] Prepared by Valentina Flamini. The incidence analysis has been computed by Kenichiro Kashiwase based on data provided by the World Bank.

[2] In January 2011, the government increased the price of diesel and gasoline by 2 SDGs per gallon, and the price of jet oil by 1.85 SDG per gallon—equal to a 44 percent increase for diesel, a 40 percent increase for jet oil and a 31 percent increase for gasoline—and the price of LPG from 12 to 13 SDGs per cylinder. The additional margin is collected by the customs and credited to the Ministry of Finance and National Economy (MOFNE) as a stabilization fund.

and physical infrastructure, including health, education, and access to safe water, and limits the budget for more effective social protection programs such as targeted cash transfers to the poor.

- *A very large share of the benefits from universal price subsidies goes to richer households, further reinforcing existing inequalities of income and consumption. Overall, almost 50 percent of subsides accrues to the richest 20 percent of households, reflecting the high consumption of subsidized energy among these households.*

- *The leakage of subsidy benefits to higher-income households means that price subsidies are a very costly approach to protecting poor households. For example, every SDG transferred to the bottom income quintiles through price subsidies costs the budget almost 33 SDG.*

- *Neighboring countries with higher prices are often substantial beneficiaries of price subsidies through cross-border smuggling. Subsidized fuel prices can result in smuggling to neighboring countries where prices are higher, thus promoting shortages, black market activities, and corruption. This effect is particularly significant in Sudan, given the unsettled border arrangements with South Sudan, where fuel products are not subsidized.*

- *Price subsidies are a passive approach to social protection and do not induce poor households to pull themselves out of poverty through their own efforts. Programs that condition transfers on beneficiary households investing in the human capital of family members (e.g., education, training, and health status) have been found to be much more effective in generating a sustained decrease in poverty and helping to break the inter-generational transmission of poverty.*

4. Although subsidies are fiscally costly, inefficient, and inequitable, removing them presents a number of policy challenges. Governments are often particularly concerned about the adverse impact on the poorest households and the potential for social unrest, while beneficiaries are often very reluctant to give up benefits. Policymakers are also concerned about the adverse impact on the competitiveness of energy-intensive industries, especially for sectors that must compete in domestic and foreign markets with international suppliers. Sudan's high and rising inflation and unstable political condition have long hampered a swift implementation of the necessary subsidy reform. However, international experience shows that most subsidy reforms occur without major civil unrest, especially if the increase in prices is gradual and well-targeted compensation programs are publicly announced.

5. A successful reform strategy needs to address these policy challenges. This requires an *effective public information campaign* that clearly sets out the shortcomings of subsidies, the fiscal risks and urgency for reform, and the details of a reform strategy that addresses the various policy challenges. This reform strategy should be (i) *gradual* to allow consumers to adjust their consumption and minimize the inflationary impact; (ii) *sequenced* to minimize the impact on poor households and allow time to strengthen the social protection system; and (iii) *durable* to avoid a recurrence of subsidies.

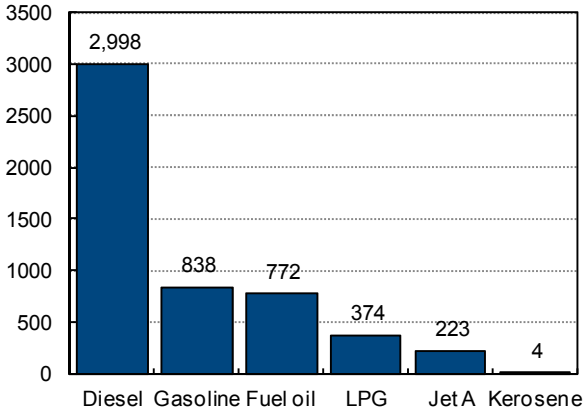
6. This chapter assesses the fiscal savings generated by the recent June reform and estimates the distributional impact of fuel subsidies after the recent increase in fuel product prices in contrast to the pre-reform status quo. After examining the magnitude of fuel subsidies pre- and post-reform, we estimate the fiscal space generated by the increase in fuel prices and we assess the distribution of the subsidy benefits in the pre- and post-reform scenario.

B. Market Structure, Pricing Regime, and Fiscal Cost of Fuel Subsidies

Structure of the Fuel Product Market

7. The consumption of petroleum fuels draws from domestically refined crude oil as well as from imported refined products. Fuel consumption has increased steadily over the past decade, owing to increased industrialization, improved access to the electricity grid, and rising car ownership. In 2012 diesel accounts for the bulk of consumption, followed by gasoline and fuel oil (Figure I.1). These fuels are used primarily for electricity production (diesel and fuel oil) and public and private transportation (diesel and gasoline). Consumption of kerosene is minor (Box I.1).

Figure I.1. Fuel Product Consumption, 2012
(THOUSANDS OF METRIC TONS)



Sources: Ministry of Petroleum, SPC; and IMF staff calculations.

8. Two refineries—the main Khartoum refinery and its extension, and the El Obeid Refinery—refine domestic crude oil to produce a full range of fuels. The main Khartoum refinery can refine up to 50 thousand barrels per day (bpd) of Nile blend crude and produces 2.5 million tons of fuel products per year, almost entirely for domestic consumption. The extension to the Khartoum refinery was constructed in 2004 to process the highly acidic Fula blend. It has a capacity of 40 thousand bpd and can produce 2 million tons of heavy fuel products (for instance, heavy coke and petroleum coke) each year, mostly for electricity production. The El Obeid Refinery has a capacity of 15 thousand bpd of Nile blend and produces gasoline, diesel, and fuel oil, with the latter—again used primarily for electricity generation—accounting for the largest share.

9. Imports account for about 20 percent of total consumption. Diesel, jet oil, and LPG are imported to cover the shortfall in domestic production. In 2011 the volume of imports accounted for 25, 20 and about 50 percent, respectively, of total consumption of these products, but the shares of imports are likely to rise following the secession of South Sudan and the recent events in the Heglig[3] area. In addition, about 75 percent of the Fula blend refined by the Khartoum expansion is

[3] On April 10 2012, South Sudan seized the contested Heglig oilfield, which produces almost half of Sudan's 115 thousand bpd, creating extensive damage to the oil infrastructure in the area. By May 7, most of the oil production from the Heglig area was reportedly resumed.

purchased from the share of the China National Petroleum Corporation (CNPC), Sudan's main partner in the extraction and refining of petroleum. Since the secession of South Sudan in July 2011, an unspecified quantity of Nile blend has also been purchased from the CNPC share, in order to keep the operations of the refineries closer to full capacity. However, the purchase of crude from partners has come to an end in 2012 due to repetitive rescheduling of payment by the government. Almost 40 percent of produced gasoline was exported until 2011, although exports of gasoline were discontinued in response to the interruption in the supply of crude from South Sudan and the Heglig incident.

Box I.1. Main Uses of Fuel Products in Sudan

Diesel: Transportation for large vehicles and some small ones; small-scale electricity generation (e.g. back-up generators at residences).

Gasoline: Mainly private transportation.

Fuel Oil: Large-scale electricity generation.

LPG: Cooking and heating for higher income families, with some use as a vehicle fuel.

Jet A1: Aviation.

Kerosene: Lighting and cooking, especially by poorer families and in rural areas; being replaced by LPG.

10. Domestic refining and imports are regulated by the Ministry of Finance and National Economy (MOFNE) and executed by the Ministry of Petroleum (MOP) through the Sudanese Petroleum Corporation (SPC), the MOP's operating arm. The SPC is responsible for exploration, production, and distribution of crude oil and petroleum fuels in accordance with the policies set by the MOFNE, who owns the crude. SPC buys crude oil from the MOFNE at US$49 per barrel and from CNPC at negotiated prices that reflect the world market. It then contracts with the refineries—owned jointly by the government and CNPC—for processing. It also manages the tenders for fuel imports and sells both the domestically produced and imported fuels to distribution and marketing companies that reflect margins and retail prices that are, again, administratively set by the MOFNE.

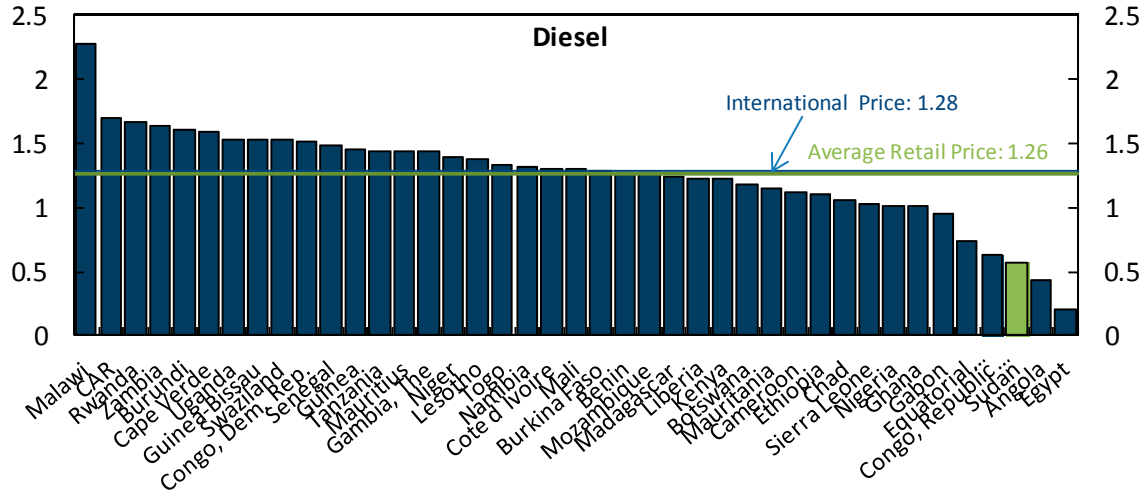
Fuel Product Pricing

11. Fuel product prices remain low by regional standards. The prices of gasoline, diesel, and kerosene are lower than in bordering countries, including Chad, the Central African Republic, Uganda, the Democratic Republic of the Congo, Ethiopia, and Kenya, and lower than regional averages (Figure I.2) which in Africa are very close to indicative international prices of US$1.28 and US$1.23 for diesel and gasoline, repectively. Low domestic prices have led to substantial smuggling to neighbouring countries that face higher domestic prices, curtailing domestic supply and effectively "exporting" the subsidies.

12. Pass-through of international fuel prices to the domestic market has been limited since the early 2000s. The government has been reluctant to pass through the increases in international prices that have occurred since 2003. Domestic retail prices have been increased only three times since 2002: in 2004, in 2006 and most recently in 2011. Initially, tax revenue was eroded, but in several periods retail prices fell short of even the before-tax cost, resulting in significant direct

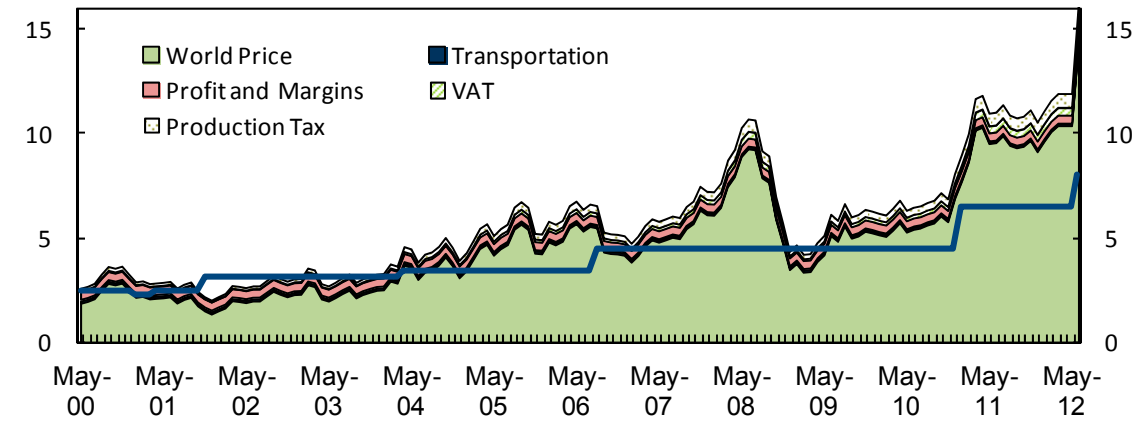
subsidies (Figure I.3). On the other hand, the drop in international fuel prices in the second half of 2008 was not passed through to domestic prices either, leading to a positive tax margin in 2009. As fuel prices bounced back starting in end-2009, direct price subsidies have reappeared despite the increase in retail prices in January 2011, and persisted even after the June reform. Overall, domestic prices have increased by only 45 percent of change in international prices since end-2008, compared to an average of 60 percent in neighbouring African countries

Figure I.2. International Comparison of Diesel Prices, 2012
(USD/Liter)



Sources: Ministry of Petroleum, SPC; and IMF staff calculations.

Figure I.3. Diesel Price and Pass-Through
(SDG/Gallon)



Sources: U.S. Energy Information Administration; Ministry of Petroleum, SPC; and IMF staff calculations

Magnitude and Fiscal Cost of Fuel Subsidies

13. Fuel price subsidies currently arise at several points in the distribution chains of crude oil and refined products:

- the Nile and Fula blends used for domestic production, including the share purchased from CNPC at international prices, are sold to SPC at the fixed price of US$49 per barrel instead of the international prices of US$110 per barrel for light crude and US$82 per barrel for heavy crude, respectively, in 2011.
- domestically refined fuels are sold at a price that is lower than their production costs, even after allowing for the subsidy on crude oil; and
- imported fuels are sold at prices well below the cost of importation.

14. Despite the June increase in fuel prices, subsidies remain high. This is mainly a result of the 66 percent devaluation of the exchange rate, which makes the cost of crude oil in local currency more expensive. Eliminating the subsidies—including the subsidy on purchases of crude oil by SPC—would require an average increase in retail prices of about 97 percent, (Table I.1), compared to 110 percent prior to the reform. To eliminate only the direct subsidy but not the tax subsidy, the required price increases would need to be 88 percent.

Table I.1. Production Costs, Retail Prices, and Subsidies
(SDG/Metric ton)

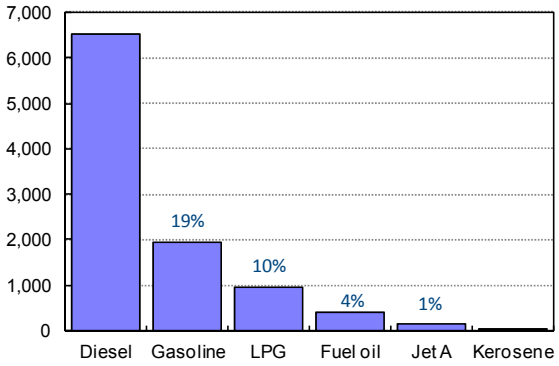
	Diesel	Gasoline	LPG	Kerosene	Jet A	Fuel Oil
Production Cost	**4196**	**5584**	**3576**	**4437**	**4472**	**894**
Cost of Crude	3734	4739	2958	4287	4287	809
Refining Cost	82	92	78	23	23	23
Transport	27	31	34	0	35	32
Profit Margin & Marketing	109	158	420	127	127	30
VAT	85	154	86	0	0	0
Production Tax	159	409	0	0	0	0
Retail Price	**2147**	**3878**	**1200**	**1858**	**4108**	**378**
Unit Subsidy	2049	1706	2376	2578	364	517
in percent of retail price	**95**	**44**	**198**	**139**	**9**	**137**

Source: Ministry of Petroleum, SPC; and IMF staff calculations.

15. The estimated fiscal cost of the direct and tax subsidies, including the subsidy on crude sales to refineries, is estimated to be SDG 10 billion in 2012, or 5.2 percent of GDP. This compares to over SDG 11 billion, or about 6 percent of GDP, in the pre-reform scenario and takes into account the half-year effect of the reform. The subsidy on crude oil is estimated to account for 44 percent of total subsidy, the subsidy on domestic refining for 41 percent, and the subsidy on imports for the remaining 15 percent. The direct subsidy was SDG 8.6 billion, and the tax subsidy was SDG 1.4 billion, 4.5 and 0.7 percent of GDP respectively. Diesel is estimated to account for over 60 percent of the total tax-inclusive subsidy alone (Figure I.4). Overall, the savings generated from the June subsidy reform over the second half of the year amount to SDG 1.3 billion, or 0.6 of 2012 GDP. The fiscal space generated from the reform increases to about SDG 2.3 billion, or 1 percent of GDP, in 2013–14 (Figure I.5).

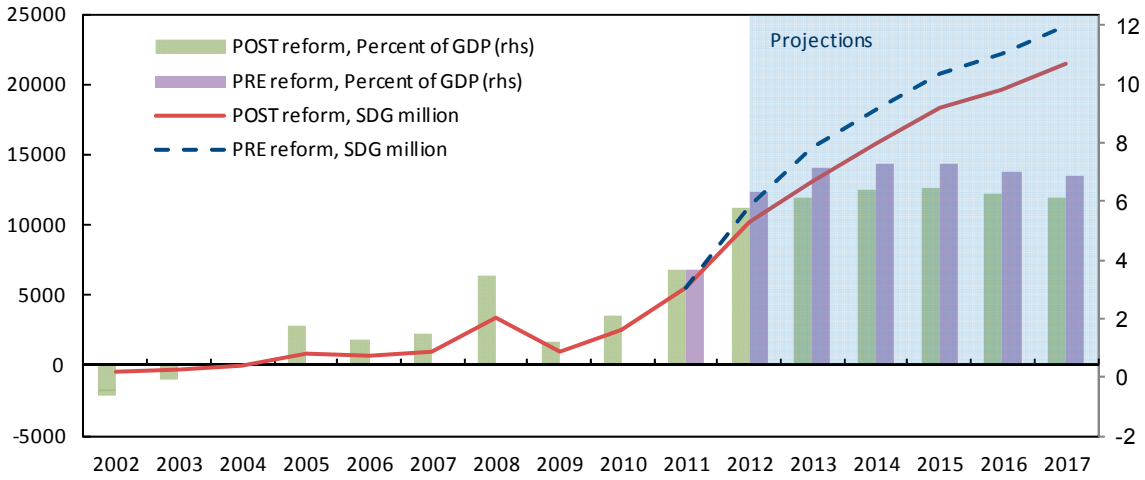
Figure I.4. Subsidies, 2011

(SDG millions)



Source: Ministry of Petroleum, SPC, and staff estimates.

Figure I.5. Fuel Subsidy Projections



Source: Ministry of Petroleum, SPC; and IMF staff calculations.

C. Welfare Impact of Price Subsidy Reform

16. The welfare impact of price subsidy reform on households arises through two channels. First, household real incomes decrease due to the increase in the prices of energy directly consumed by households for cooking, lighting, heating, and private transport. This is referred to as the "direct impact." Second, real incomes also decrease due to an increase in the prices of other goods and services that use energy in their production and distribution. This is referred to as the "indirect impact." The reform of fuel subsidies would entail a substantial indirect impact due to higher transportation and production costs.

17. Sudanese households allocate a minor portion of their budgets to subsidized energy.[4] Consumption of subsidized energy accounts on average for 1.4 percent of total household consumption (Table I.2). At 0.6 percent of total consumption, expenditures on LPG account for the largest component of energy consumption. The pattern of energy expenditures varies across income groups, with the budget share increasing with household income. Yet, whereas the budget shares of LPG, generator fuel and gasoline are larger for higher-income groups, the budget share for kerosene is larger for lower income groups.

18. The direct welfare impact of the simulated price increases is minor and mostly related to the direct effect of the subsidy removal. On average, the simulated price increases result in a 3.5 percent decrease in household real income (Table I.2). About 56 percent of such welfare loss (1.9 percent of real income) is due to the direct effect of the subsidy removal, while the remaining 44 percent (1.5 percent of real income) is attributable to the indirect impact on the price of electricity and other goods and services that use energy in their production and distribution. Such effect is typically very high for diesel, as it is used for commercial transportation and electricity production.

[4] Since consumption of diesel and jet fuel is not covered in the 2009 National Budget Household Survey (NBHS), the welfare effect of an increase in the price of those commodities on household income cannot be directly quantified with the methodology used in this chapter.

Table I.2. Distribution of Total Subsidies and Real Income Effect of Eliminating Subsidies, by Welfare Group

	Quintile					All
	Bottom	2	3	4	Top	households
	Expenditure on Subsidized Products					
	Percent of total consumption					
Direct consumption	0.9	1.7	2.2	2.6	3.6	1.4
Gas Cylinder	0.2	0.5	0.7	0.7	0.8	0.6
Kerosene	0.3	0.2	0.2	0.2	0.1	0.2
Generator Fuel	0.1	0.1	0.2	0.2	0.3	0.2
Gasoline	0.1	0.2	0.2	0.4	0.8	0.4
	Real Income Effect of Eliminating Fuel Subsidies					
	Percent of total consumption					
Direct impact	1.0	1.5	2.1	2.1	2.4	1.9
Gas Cylinder	0.5	1.0	1.4	1.4	1.5	1.2
Kerosene	0.4	0.3	0.3	0.2	0.1	0.2
Generator Fuel	0.1	0.2	0.3	0.3	0.4	0.3
Gasoline	0.0	0.1	0.1	0.2	0.3	0.2
Indirect impact	1.3	1.4	1.5	1.6	1.6	1.5
Electricity	0.1	0.2	0.2	0.3	0.4	0.2
Transportation	0.1	0.2	0.2	0.2	0.2	0.2
Food	1.1	1.1	1.1	1.1	1.0	1.1
Total impact	2.2	2.9	3.6	3.7	4.1	3.4
	Distribution of Total Subsidies					
	Percent of aggregate benefit					
Direct impact	3.4	8.7	16.0	23.6	48.3	100
Gas Cylinder	2.9	9.4	17.6	24.9	45.2	100
Kerosene	13.6	18.1	23.7	23.3	21.3	100
Generator Fuel	1.9	5.5	12.8	22.6	57.3	100
Gasoline	1.2	4.0	8.0	19.1	67.8	100
Indirect impact	6.1	11.1	16.1	23.3	43.4	100
Food	6.9	11.9	16.8	23.5	41.0	100
Total impact	4.4	9.6	16.1	23.5	46.4	100

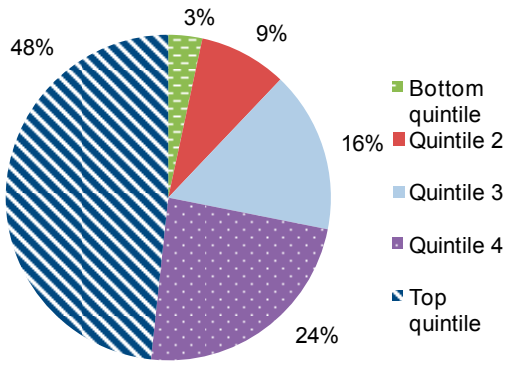
Source: NBHS (2009); World Bank (2011); IMF staff calculations.

19. The welfare impact is progressively distributed, with the loss in real income higher for higher-income households. The progressivity of the total impact is driven by the highly progressive direct impact of higher fuel prices on households, while the indirect impact is less progressively distributed because of the slightly regressive indirect effect of the increase in food prices. As a result, the direct impact accounts for 43 and 59 percent of the total in the bottom and top quintile respectively. On average, the welfare loss of increased energy prices for households in the top income quintile is 4.1 percent compared to a 2.2 percent loss for households in the bottom income quintile.

20. Since most of the benefits from subsidies are captured by higher-income households, these households will also bear most of the burden of their removal. Overall, the top income quintile receives 48 percent of total subsidy, compared to 3 percent received by the bottom income. (Figure I.6, Table 2). In other words, every SDG transferred to the bottom income quintile through price subsidies costs the budget more than 33 SDG. The leakage of benefits is especially pronounced in the case of gasoline, where the top income quintile households receive more than 56 times more in subsidies than the bottom quintile. Accordingly, the total leakage to richer households decreased following the recent increase in the price of gasoline, from 51 percent in the pre-reform scenario, to 48 percent since June.

Figure I.6. Distribution of Subsidy, 2012

(Percent of total benefit)



Source: Ministry of Petroleum, SPC, and staff estimates.

D. Policy Recommendations

21. The increase in fuel prices implemented in June was appropriate, but the fuel subsidy remains high and the reform momentum should be maintained. The analysis of the welfare impacts of subsidy reform and how it is distributed across different income groups can inform the design of a reform strategy that gradually eliminates price subsidies while protecting poor households. The success of any reform strategy can be enhanced by an effective public information campaign that clearly sets out the shortcomings of price subsidies and the urgency of the need for reform. Given the unstable political conditions, such a campaign should be launched ahead of any further price increase. To be credible, this campaign should also identify the details of a reform strategy that addresses the various policy challenges. This reform strategy should be gradual, sequenced, and durable.

- Gradual withdrawal of price subsidies allows households and enterprises sufficient time to adjust their consumption behavior (e.g., to increase energy efficiency) thus reducing the adverse impact of future price increases. It also reduces the inflationary impact arising from the indirect effect of higher energy prices on the prices of other goods and services consumed by households. In this respect, the government's commitment to phase out subsidies within three years is appropriate.

- An appropriate sequencing of subsidy reforms, concentrating first on items that are less important for lower-income households (for example gasoline, LPG, and generator fuel), can minimize the adverse impact on these households and allow time to build a more effective social protection system. In this respect, the government's choice to frontload the increase in the price of gasoline is also suitable.

- An essential prerogative of a sustainable price subsidy reform is the institution of a targeted social protection system, which shields poor households from price increases (and other economic shocks). If properly designed, an effective social protection system could help needy households pull themselves out of poverty through investing in the human capital of family members. International evidence suggests that the combination of large relative price increases and a lack of compensation programs and public outreach can lead to political unrest in a politically fragile environment. Contextual to the increase in fuel prices, the authorities have more than doubled the provision for social spending. However, such spending is not targeted and the government should intensify its efforts to design a well targeted and efficient social safety net.

- To be durable, the reform strategy should address the underlying causes of price subsidies. This requires a new approach to pricing, especially energy pricing. The first-best approach is to move to a fully liberalized pricing system backed up by an effective regulatory framework that ensures competition. However, introducing an automatic fuel pricing mechanism is a key component of the transition to a liberalized system and away from a subsidized regime. The political acceptability of such a mechanism may be enhanced by the adoption of a price-smoothing component, which would ensure full pass-through of international price changes over the medium term, but avoid large short-term increases in domestic prices. Under this approach, the government continues to protect the population from extreme price volatility by absorbing it into fiscal policy.

22. The fiscal savings can help to protect public spending plans for high-priority items such as education, health, infrastructure, and targeted social assistance, while maintaining fiscal sustainability. This approach, in turn, can reinforce economic growth, which also helps to offset the adverse welfare impacts of price reforms on the population.

II. SUDAN'S INFLATION PROBLEM: SOME LESSONS FROM THE PAST 30 YEARS[1]

Inflation in Sudan is a well-entrenched and persistent phenomenon. This analysis finds as key determinants: the exchange rate, reserve money, fiscal monetization, and wages. The exchange rate's leading role implies that the dynamics of domestic inflation are heavily influenced by the external environment, highlighting the openness of Sudan's economy, but also the focus on the exchange rate in the formation of inflationary expectations. Fiscal policy seems to have a limited direct effect but has an indirect impact via the government wage policy and the monetization of the budget deficit. Reserve money remains largely determinant in times of high inflation.

A. Background

1. During the 1980s and mid-1990s, Sudan suffered considerably from high inflation, including hyperinflation. Inflation was the result of weak economic and financial policies, including considerable financial (monetary and fiscal) expansion, severe import compression, extensive price and wage controls, rationing, high subsidies, and constraints on the private sector. These policies resulted in a large and active parallel market for goods and services and foreign exchange, and a surge of inflation which averaged 40 percent in the first half of the 80s only to accelerate thereafter, reaching 130 percent in 1991 and 140 percent in 1992.

2. Starting in 1991–92, in an effort to address the economic and financial situation, the authorities reduced their interference in the economy and opted for market-friendly policies. Almost all price and profit controls were abolished, and the prices of traded goods, with the exception of petroleum, sugar and wheat, reflected international prices. The foreign exchange rates and markets were unified, a move that required a devaluation of the exchange rate of more than 2000 percent. However, fiscal policy and monetary policy did not follow suit, with the result that inflationary pressure exceeded 150 percent by 1996.

3. In 1997–98, to address these deficiencies, Sudan embarked on a comprehensive and sustained structural reform program with the assistance of the Fund. The economy responded positively to these policies and reforms developed under the subsequent Staff-Monitored Programs (SMPs); inflation started to decline, dropping to 17 percent in 1998 and to 8 percent in 2000. However, double-digit annual inflation re-emerged in 2006 and persisted thereafter, reaching 19 percent in December 2011 and 37 percent in June 2012.

4. During the 1999–2010 period, Sudan's macroeconomic performance was broadly satisfactory. Real growth averaged 6 percent and fiscal and external deficits remained modest at about 2 percent of GDP and 4 percent of GDP, respectively. However, inflation was the exception, remaining very high at an average of 13 percent.

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[1] Prepared by Ramdane Abdoun.

5. This brief historical overview of inflation in Sudan during the past 30 years underscores that inflation is a well entrenched and persistent phenomenon. The central bank has only partially prevailed over it. Due to data limitations, this chapter will not cover the hyperinflation period, but instead will focus on the years 1998–2011. The latter period is important for two reasons: (i) It begins with the start of the oil era and ends with it; and (ii) with an average annual increase in the CPI of 13 percent, inflation emerges as the weakest link of a rather satisfactory macroeconomic performance.

6. This chapter is organized as follows: Section 1 presents an empirical analysis of inflation in Sudan, using quarterly data over the period 1998–2011. Section 2 discusses the calibration of a small model to forecast inflation. Section 3 discusses how reduced inflation could contribute to the stabilization of the macroeconomic framework and the successful transition to an economy less dependent on oil.

B. Main Features of Sudan's Economy

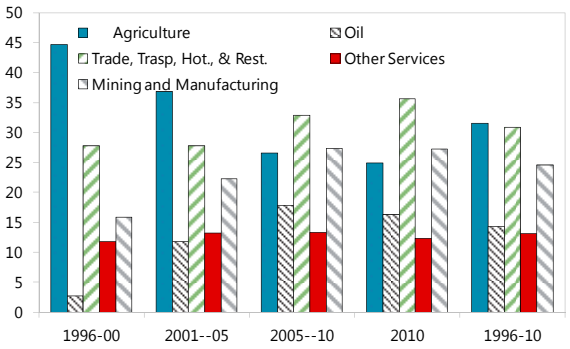
Structure of the Economy

7. For the past 15 years since the discovery of oil, Sudan has been able to maintain a relatively diversified economy. During this period, the bulk of economic activities continued to be evenly distributed among three main sectors (Figure II.1):

- **Agriculture,** whose contribution to GDP averaged about 32 percent;
- **Economic services**, with a contribution slightly in excess of 30 percent of GDP; and
- **Mining, Manufacturing, Energy and Construction (MMEC),** the fastest growing sector, owing to the discovery and expansion of the oil sector; with an average contribution of about 25 percent of GDP (Appendix II, Table 1).

Figure II.1. GDP by Main Sectors

(In Percent of GDP at factor cost)



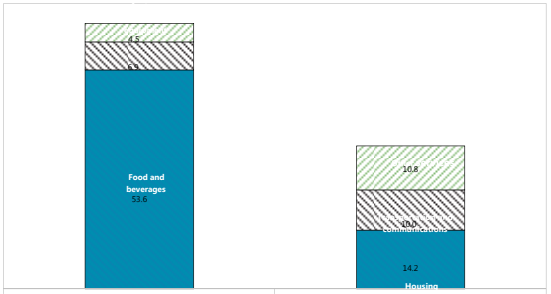
Sources: Sudanese authorities; and staff estimates.

The remaining economic activities are constituted of social services (about 13 percent of GDP), including government services, whose share remained relatively stable at about 8 percent. Overall, while the oil sector's value added was fairly modest (14 percent of GDP), its role in the financing of the country's budget and BOP has been crucial (Appendix II, Table 2).

The CPI Basket

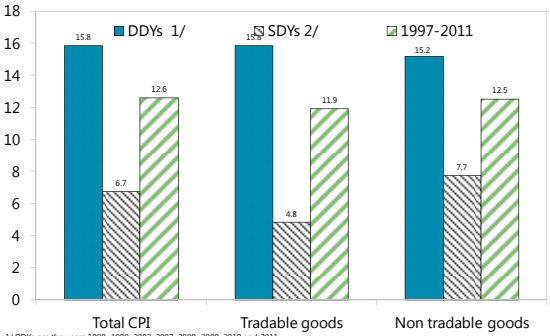
8. Sudan's CPI basket contains 12 categories of goods and services, with tradable goods constituting 65 percent against 35 percent for the nontradable goods (Figure II.2; Appendix II, Table 3). The average annual inflation during the past 14 years was about 13 percent. This relatively high average is the result of a mix of double-digit inflation years (DDYs) with more modest or single digit inflation years (SDYs). The period 1998–11 comprises five SDYs with an average annual inflation of about 7 percent and nine DDYs with an average annual inflation of 16 percent (Figure II.3).

Figure II.2. CPI Basket by Main Categories of Goods



Sources: Sudanese authorities; and staff estimates.

Figure II.3. Inflation Profile, 1997–2011

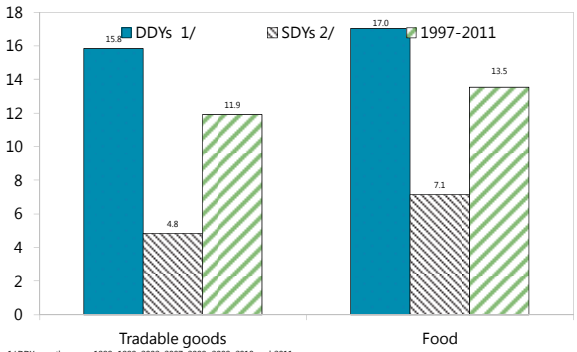


1/ DDYs are the years 1998, 1999, 2002, 2007, 2008, 2009, 2010 and 2011.
2/ SDYs are the years 2000, 2001, 2003, 2004, 2005.

Tradable versus nontradable goods

9. During the DDYs, high inflation was characterized by relatively high prices of both tradable and nontradable goods, with the highest rates registered for foodstuffs (tradables) and nonmarket services (nontradables) (Figure II. 4; Appendix II, Table 4).

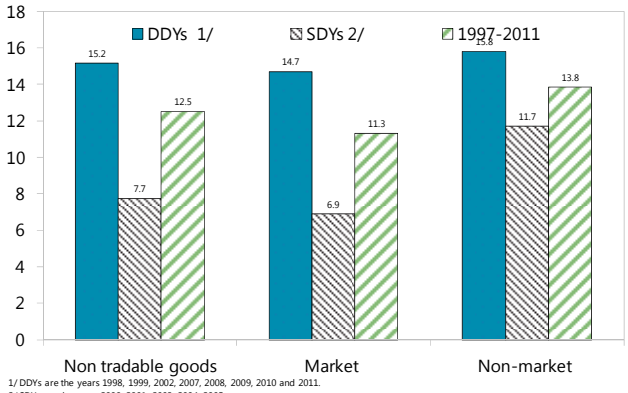
Figure II.4. Tradable Goods Inflation, 1997–2011



1/ DDYs are the years 1998, 1999, 2002, 2007, 2008, 2009, 2010 and 2011.
2/ SDYs are the years 2000, 2001, 2003, 2004, 2005.

10. The SDYs were characterized by a relatively low increase in the price of tradables (including food items) coupled with double-digit inflation on nonmarket nontradables (Figure II.5). The surge in the price of nonmarket nontradables in times of lower tradable goods inflation could suggest an underlying policy of loosening government control on these prices when inflationary pressures were abating.

Figure II.5. Nontradable Goods Inflation 1997–2011



1/ DDYs are the years 1998, 1999, 2002, 2007, 2008, 2009, 2010 and 2011.
2/ SDYs are the years 2000, 2001, 2003, 2004, 2005.

Volatility and seasonality

11. Price volatility appears to be systemic, which would indicate an unstable economic environment. Seasonality, however, appears to be limited to foodstuffs (Appendix II, Table 5).

C. Modeling Inflation in Sudan

Data and Information Gaps

12. Collecting data for this analysis was difficult owing to large gaps in variables that have an impact on inflation.[2]

13. Modeling inflation in Sudan required making some assumptions regarding Sudan's private consumption behavior. In particular, it has been assumed that Sudan's households have:

- a high and stable (over time and throughout the various population strata) propensity to consume (above 0.9);[3] and
- a utility function centered on: (i) first satisfying basic consumption requirements (tradables, and nontradables); and (ii) budget permitting, consuming secondary tradables and nontradables and/or savings.

These assumptions are in line with other low-income countries with moderate growth, which is the case for Sudan.

The Database

14. The model's database includes quarterly series covering the period 1998/Q1 –2011/Q4 for the following variables**:**

- The Consumer Price Index;
- The price index for tradable goods (TrCPI) derived from the CPI by aggregating the tradable categories of the CPI;
- The price index for nontraded goods (NTrCPI) derived from the CPI by aggregating the nontradables categories of the CPI;
- Reserve money;

---

[2] Quarterly fiscal data; non-oil GDP (income approach), economy's average wage, average size of and wage in the civil service, employment in the nonagricultural sector; employment in the agricultural sector; non-monetary private consumption; quarterly import volume and price indices; quarterly non-oil export volume and prices indices; quarterly agricultural production indices (volumes and prices).

[3] The propensity to consume is used to derive the households' disposable income and savings.

- Government current expenditure (GXC);
- The exchange rate (SDGs per USD) $NER ; and
- Household consumption in nominal terms (FCh) and real terms (FChQ), which have been derived by interpolating annual data and taking into account the CPI's seasonal factors.

All variables have been converted into indices based in 1998/Q1: (1998/Q1=100).

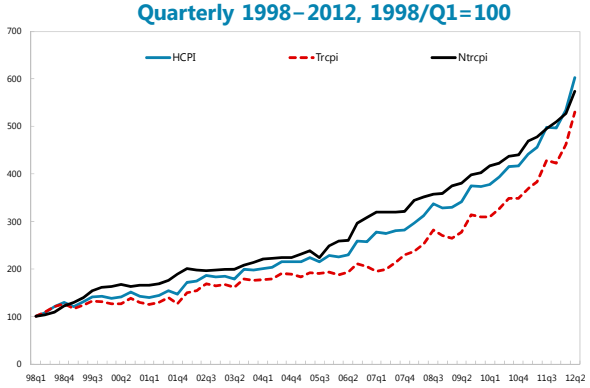
15. In order to better understand the specificities of inflation dynamics during high and low inflation years, the data sample has been divided into two sub-samples covering the DDYs and SDYs.[4]

Key Trends During the Observation Period

16. The key trends during the observation period for the variables that will be used in the regressions are as follows:

- Imported inflation as measured by the change in the import price in SDG terms is very close to the traded goods inflation, a strong indication that all traded goods, including nonexportables, are in line with international prices.

Figure II. 6. Inflation Developments, Quarterly 1998–2012, 1998/Q1=100



Sources: CBS-Sudan

- During low inflation years (SDYs), official reserves were high and the exchange rate appreciated, which allowed a substantial increase in imports of consumer goods in nominal terms (25 percent per year on average in SDG terms, almost twice that of private consumption) and in real terms (20 percent per year on average, more than three times higher than the real increase in private consumption) (Figure II.6; Table II.1).

[4] In case there are two nonsuccessive years within the same sub-sample, a chain coefficient is used to connect them. Assuming that the years *t* and (*t*+2) are part of the DDYs sub-sample, for a given variable *X*, chaining the first quarter of year (*t*+2) to the last quarter of year *t* would consist in (i) chaining the first month of year (*t*+2) to the 12th month of year *t* using the change in percent between the first month of (*t*+2) and the 12th month of year (*t*+1); (ii) reconstituting the remaining months of year (*t*+2) using as a base the revised first month of year (*t*+2); and (iii) deriving the new quarters of year (*t*+2) by consolidating the revised months.

Table II.1. Average Annual Changes of Key Determinants of Tradable Goods Inflation, (1998–2011)

	SDYs	DDYs	Total
Key variables			
Tradable goods inflation	4.8%	15.8%	11.5%
Import price (in US$)			
In US$ 1/	6.1%	3.8%	4.7%
In SDGs	3.9%	13.9%	9.9%
Reserve money (nominal)	27.2%	23.1%	24.7%
Current expenditure (central government)	45.5%	17.7%	27.7%
Wage bill (central government)	30.7%	23.9%	26.4%
Exchange rate (-=appreciation)	-2.1%	9.7%	5.0%
Gross reserves in (months of imports)	4.9	3.0	3.7
Memorandum items			
Nonoil GDP growth	5.2%	4.3%	4.7%
Agriculture	1.1%	0.7%	0.8%
Other	8.4%	6.2%	7.0%
Nonoil GDP deflator	8.1%	12.6%	10.8%
Velocity of reserve money	13.0	12.2	12.5
Private consumption (nominal)			
Nominal	13.5%	17.6%	16.0%
Real	6.3%	1.5%	3.3%
Imports of consumption goods			
In US$	27.2%	12.4%	17.9%
In SDGs	24.6%	23.3%	23.8%
Real 2/	19.9%	8.2%	12.6%
Reserve money (real) 3/	19.2%	6.3%	11.1%

1/ Source (GEE)
2/ At constant SDG prices.
3/ Using as a deflator the CPI.

- On the contrary, during high inflation years (DDYs), reserves were low and the exchange rate weaker. While imported inflation measured in USD was fairly modest (more than 60 percent lower than that recorded during the low inflation years) it was almost four times higher in SDG terms, owing to the steep depreciation of the exchange rate. As a result, the increase in imports of consumer goods in real terms was reduced to an average of 8 percent per year, which remains, however, fairly high compared with the estimated 1½ percent real increase in final consumption.

- Both central government current spending and wage bill grew much faster during low inflation years (46 percent and 31 percent, respectively) than during high inflation years (18 percent and 24 percent, respectively), which would indicate that these variables have only limited direct impact on inflation.

- During both low and high inflation years, reserve money grew at the same high pace, around 25 percent per year on average. However, the fact that non-oil GDP real growth was much higher during SDYs (especially in the nonagricultural sector)[5] than during DDYs would suggest that the demand for base money during the former was driven by economic growth and hence was less inflationary; also the velocity of base money in SDYs was higher than in DDYs. Conversely, with slower economic growth (especially in the nonagricultural sector), demand for base money during DDYs was mostly driven by inflation and inflationary pressures. That said, the absence of effect on inflation of the substantial increase in reserve money during low inflation years remains a puzzle that needs to be investigated further.

D. The Main Model

17. In this analysis the inflation model for Sudan is centered on a set of three equations:

- an equation explaining price developments for tradables;

- an equation explaining price developments for nontradables; and

- a third equation deriving total inflation as a function of tradable goods and nontradable goods inflation.

All the regressions have been done using the OLS methodology.

18. The model for tradable goods inflation is an auto-regressive model with one lag and three independent variables including current government spending $\boldsymbol{X_{2,t}}$; the exchange rate of the SDG against the U.S. dollar (with one lag) $\boldsymbol{X_{3,t-1}}$, [6] and nominal private consumption (with one lag) $\boldsymbol{X_{4,t-1}}$ [7]:

$$\boldsymbol{Y_{1,t}} = 0.41\,\boldsymbol{Y_{1,t-1}} + 0.011\,\boldsymbol{X_{2,t}} + 0.349\,\boldsymbol{X_{3,t-1}} + 0.219\,\boldsymbol{X_{4,t-1}} \qquad R^2 = 0.99 \qquad (1)$$

t-Stat (2.9) (2.01) (3.91) (4.32)

[5] Although outside the purpose and scope of this chapter, it is worth mentioning the negative effect of inflation on non-oil growth, particularly in the nonagricultural sector.

[6] Both the NEER and nominal exchange rate against the U.S. dollar have emerged as statistically significant regressors. The latter has been chosen because it is more a policy variable than the former and easy to project.

[7] In the regression, this variable has been used as a proxy for households' disposable income.

19. The specification of the model is appropriate and passes all the standard tests of statistical robustness (homoskedasticity, autoregressive conditional heteroskedasticity (ARCH), serial correlation, and unit root).[8] Due to the lack of data on domestic production costs and household income, private consumption is used as a proxy variable for these costs which constitute the key component of domestic inflation. The assumption underlying this choice is that private consumption is highly correlated to household income (see footnote 2) which in Sudan constitutes the bulk of non-oil GDP. The role of this variable in equation (1) would then be to capture part of these costs and reflect them in tradable goods inflation.[9] Overall, the domestic costs variable has the highest elasticity: a 10 percent increase in domestic costs, *ceteris paribus,* would generate an increase in tradable goods inflation of 3.8 percent, compared with 1.8 percent for the exchange rate and 0.6 percent for government spending.

20. The model for nontraded goods inflation has the same specification as the model for traded goods inflation, i.e., using level variables. It has three explanatory variables: tradable inflation **($Y_{1,t}$)**, reserve money with one lag **($X_{1,t-1}$),** adjusted government current spending with one lag **($X_{2,t-1}$),** and the internal terms of trade (with one lag) **($X_{6,t-1}$).**

$$Y_{2,t} = 0.38\,Y_{1,t} + 0.11\,X_{1,t-1} + 0.03\,X_{2,t-1} + 0.74\,X_{6,t-1} \qquad R^2 = 0.99 \qquad (2)$$

t-Stat (5.3) (6.8) (5.2) (11.4)

21. The specification of the model is appropriate and passes the standard tests of statistical robustness (mainly homoskedasticity and serial correlation). The contribution of the independent variables to overall nontradables inflation is given by their respective elasticities: other things being equal, a 10 percent increase in lagged reserve money would raise nontradable goods inflation by 4 percent, compared with 3.1 percent for traded goods inflation, and 1.2 percent for government current expenditure. Also, an improvement in nontradables inflation during period *t* is positively correlated to the internal terms of trade during period (*t*–1) with an elasticity of 0.17.[10] The small influence of government spending in the model for nontradable goods inflation appears as a confirmation that nontradable goods inflation is mainly driven by monetary policy. One could argue, however, that in this case, monetary policy (base money supply) is highly influenced by the size of the fiscal deficit, as evidenced by the fact that controlling for reserve money more than doubles the contribution of government spending.

[8] The small coefficient on government spending reflects the considerable increase in the government spending index (1998q=1100) during the observation period: At end-2011 it reached about 2,200 compared with some 240 for the exchange rate, 750 for the proxy for domestic costs and about 430 for the tradable goods CPI.

[9] Excluding a domestic cost variable from the regression because of data unavailability could affect the reliability of the coefficients on the remaining variables. Using a proxy variable for an unavailable explanatory variable could mitigate the omitted variable's bias and enhances the quality of the estimators of the coefficients on the other observed variables. (On using proxy variables, see *Econometrics* (J.M. Wooldridge).

[10] The Itot variable has been chosen in place of the lagged nontradables inflation for which the null hypothesis of a unit root could not be rejected at a satisfactory significance level.

22. The third equation of the model is a statistical equation summarizing the contribution of each of the tradable ($\boldsymbol{Y_1}$) and non-traded goods inflation ($\boldsymbol{Y_2}$) to total CPI inflation (Y_t).

$$\boldsymbol{Y_t} = 0.62\,\boldsymbol{Y_{1,t}} + 0.39\,\boldsymbol{Y_{2,t}} \qquad R^2 = 0.99 \quad (3)$$

t-Stat (11.5) (12.7)

It is worth noting that the coefficients on $\boldsymbol{Y_1}$ and $\boldsymbol{Y_2}$ are somewhat close to their respective weights in the 2007 CPI basket.

E. The SDY Sub Model

23. The regression related to tradable goods inflation gives the following equation:

$$\mathrm{Y_{1,t}} = 0.17\,\mathrm{X_{1,t}} + 0.82\,\mathrm{X_{3,t}} \qquad \mathrm{R^2} = 0.68 \quad (1\text{-b})$$

t-Stat (8.9) (26.4)

The specification of the model is different for that of the main mode and indicates that in time of low inflation, only reserve money $\boldsymbol{X_{1t}}$ and the exchange rate $\boldsymbol{X_{3,t}}$ emerge in the regression as significant independent variables; government expenditure does seem to have had no effect on tradable goods inflation despite the fact that during this period it had a relatively high average annual change (Table II.2). The estimated model underscores that during the SDYs, the appreciation of the exchange rate helped to contain tradable goods inflation which at the same time was being boosted by a lax monetary policy. This result should, however, be interpreted with caution, given that during the estimation period the official exchange rate appreciated only about 2 percent per year whereas reserve money was increasing at a pace of 27 percent per year on average. More specifically, according to the model a 10 percent appreciation/depreciation of the exchange rate, *ceteris paribus*, results in a 6.3 percent increase/drop in tradable goods inflation, compared with an increase of 3.7 percent for a 10 percent increase in reserve money.[11]

24. The regression related to nontradable goods inflation gives the following model:

$$\boldsymbol{Y_{2,t}} = 0.17\,\boldsymbol{X_{2,t}} + 0.82\,\boldsymbol{Y_{1,t}} \qquad R^2 = 0.86 \quad (2\text{-b})$$

t-Stat (7.1) (16.4)

25. Only government current spending and tradable goods inflation emerge in the regression as significant independent variables. Under this model, an increase in the price of tradables of 10 percent would result in an increase in the price of nontradables of about 6.3 percent compared with 3.7 percent for a 10 percent change in government spending.

[11] The modest size of the sample used for the regression and the low correlation coefficient call for caution when interpreting these results.

26. As for the main model, the third equation of the model summarizes the respective contribution of tradable ($\boldsymbol{Y_1}$) and nontraded goods inflation ($\boldsymbol{Y_2}$) to total CPI inflation (Y_t).

$$\boldsymbol{Y_t} = 0.62\,\boldsymbol{Y_{1,t}} + 0.39\,\boldsymbol{Y_{2,t}} \qquad R^2 = 0.98 \quad \text{(3-b)}$$

t-Stat (11.5) (12.7)

27. It is worth noting that the coefficients on $\boldsymbol{Y_1}$ and $\boldsymbol{Y_2}$ are close to their respective weights in the 2007 CPI baskets (0.65 and 0.35) than those of the main model.

F. The DDY Sub Model

28. The model for tradable goods is statistically robust with statistically significant parameters for all independent variables.[12] The equation is as follows:

$$\boldsymbol{Y_{1,t}} = +0.13\,\boldsymbol{X_{1,t}} + 0.24\,\boldsymbol{X_{2,t}} + 0.34\,\boldsymbol{X_{3,t}} + 0.27\,\boldsymbol{X_{4,t}} \qquad R^2 = 0.99 \quad \text{(1-c)}$$

t-Stat (2.3) (6.9) (6.4) (2.6)

The model indicates that in time of high inflation, the key macro variables that have an impact on inflation of tradable goods include reserve money, adjusted government current spending, the exchange rate, and private consumption as a proxy to domestic costs. In terms of elasticities, the exchange rate is second to domestic costs and is followed by adjusted government spending and reserve money. More specifically, a 10 percent increase in domestic costs, *ceteris paribus*, generates an increase in tradable goods inflation of 3.1 percent, compared with 2.4 percent for a 10 percent depreciation of the exchange rate, and 2.3 and 2.2 percent for adjusted government spending and reserve money, respectively. The elasticity of the exchange rate is close to the estimated import content of private consumption (about 20 percent) and confirms the important role of the curb exchange rate which has been used in the regression as of 2008. It is worth mentioning however that due to the cash nature of Sudan's economy, the overall effect of the exchange rate is even higher when combined with its effect on demand for base money.

29. The regression related to nontradable goods inflation gives the following model:

$$Y_{2,t} = 0.33\,X_{1,t} + 0.17X_{2,t} + 0.67X_{6,t-1} \qquad R^2 = 0.98 \quad \text{(2-a)}$$

t-Stat (13.7) (3.4) (11.5)

30. The model is statistically robust: it passes the standard tests (homoskedasticity and serial correlation), and the parameters of the independent variables are statistically significant. While both reserve money and government emerge as having a noticeable effect on nontradable goods inflation, it is reserve money that is revealed as the dominant independent variable with the highest elasticity. The third variable—the lagged internal terms of trade—plays the role of a

[12] Contrary to the main model, in the DD model the lagged tradable inflation variable does not emerge with a statistically significant coefficient.

memory variable in the nontradables inflation process, reflecting the structural changes in the relative price of nontradables in terms of tradables. More specifically, everything else being equal, a 10 increase in reserve money would result in an increase in the price of nontradables of 6.5 percent compared with 1.8 percent for a 10 percent increase in adjusted government current spending. The inflation component related to the internal terms of trade works as follows: a 10 percent increase in the internal terms of trade during (*t*–1) would generate a carry-forward to period *t* of a 1.7 percent of nontradables inflation.[13]

31. The third equation of the model is as follows:

$$\boldsymbol{Y_t} = 0.67\,\boldsymbol{Y_{1,t}} + 0.39\,\boldsymbol{Y_{2,t}} \qquad R^2 = 0.98 \quad (3\text{–}c)$$

t-Stat (15.1) (8.6)

32. It is worth noting that the coefficients on $\boldsymbol{Y_1}$ and $\boldsymbol{Y_2}$ are closer from their respective weights in the 2007 CPI baskets (0.65 and 0.35) than those of the main model.

G. Discussion of the Results

33. The results of the various models are recapped in the table below, which summarizes the elasticities associated with a 10 percent increase in the main independent variables used in the various regressions. Given their important policy implications, these results raise the following key questions that would need to be addressed:

- What is the rationale for the apparent reduced impact of government spending on inflation?
- Why does reserve money appear to have a more active role than the other variables, especially during high inflation years?
- Why does the exchange rate play a role that goes beyond its indirect impact through imported goods?

[13] For example during (*t*–1) nontradable and tradable prices increased by 22 percent and 20 percent respectively, then a 1.7 percent price increase in nontradables is carried forward to period *t*.

Table II.2. Sudan: Inflation Model Elasticities

	Main	SD Model	DD Mode
Reserve money	2.1%	3.1%	3.7%
Government current spendingh	0.7%	1.7%	2.1%
Exchange rate	0.8%	5.3%	1.6%
Private consumption/Domestic costs	2.1%	--	2.0%
Internal terms of trade	0.9%	--	0.6%

34. The reduced role of government spending could be explained by the fact that: (i) part of this spending is sterilized through the balance of payments; and (ii) only the wage bill could have a direct effect on prices, which could only be limited given that the federal government wage bill represents about 7 percent of the total household income.[14] This unexpected result[15] does not seem to be in line with the accepted assumption that the discovery of oil in Sudan in the second half of the 1990s heightened fiscal dominance and limited the Central Bank of Sudan's (CBOS) room to maneuver in fighting inflation.

35. However, the fact that the regressions have not revealed any form of government spending as a significant independent variable does not necessarily reject the existence of indirect correlation between government spending and consumer inflation. In particular, it is worth noting that there are two key indirect channels through which fiscal policy can affect inflation, namely: (i) The wage channel which goes through private consumption, a significant independent variable in both the tradable goods and non-tradable goods inflation models;[16] and (ii) the monetary financing of the budget which goes through reserve money, whose effect is amplified by the cash nature of the Sudanese economy.

[14] Assuming that a Sudan household's average propensity to consume is in the order of 90–95 percent, we can derive that compensation of employees in Sudan was about SDG 115 billion in 2010, about 11 times higher than the wage bill of the civil service of the general government (i.e., including the states).

[15] There is a possibility that this is due to limitations of the fiscal data. Indeed, contrary to the monetary and exchange rate data, fiscal data are not compiled on a quarterly basis by the authorities. Thus, for the purpose of this note, these data had to be estimated using ad-hoc quarterly execution rates of the federal budget.

[16] In fact, the regression of private consumption on the central government wage bill reveals a very high dependence of the former on the latter, which is consistent with the widely recognized role of the government as the wage setter in the economy. Based on available information, the government does not interfere in wage setting in the private sector, except for the requirement of a minimum wage level. In practice, the minimum wage is a key benchmark for the salary scale of the public sector and used as a base for wage negotiations in the private sector.

36. With respect to reserve money, almost all the estimated models indicate that inflation responds significantly to monetary stimulus when inflation has reached a relatively high level. It remains, however, a puzzle that during SDYs the substantial increase in reserve money (21 percent per year on average) did not have any marked effect on prices.[17]

37. The emergence of the exchange rate as a key determinant of tradable goods inflation confirms that in Sudan prices of tradables are broadly in line with international prices. This conclusion, which applies to both exportables and nonexportables, implies also that Sudan's internal inflation dynamics for these goods (including production costs) are heavily influenced by the exchange rate and external prices. The large influence of the curb market exchange rate on the tradable goods CPI was quite evident during the past two years, as indicated by the statistical robustness of the regression of the latter on the former and the high correlation between the two variables.[18]

Performance of the model

38. The model is composed of a main model (MM) that has been estimated over the period 1998 Q1–2011Q4, and two sub-models SM1 and SM2 relative to the high and low inflation periods, respectively.

- Performance of MM is broadly satisfactory: it is stable with a relatively strong analytical capability of developments of inflation in Sudan in the last 15 years. Its predictive capacity, however, is impaired by the fact that the estimated coefficients on the independent variables are associated with a rather nonhomogenous period of wide variations in inflation and policies.

- Performance of the sub-model DDYM relative to the high inflation years is greater than that of MM, as the coefficients on the independent variables are associated with more homogenous macroeconomic conditions. In particular, this model appears relevant to the current situation in Sudan and could appropriately be used for projection purposes.

- The model SDYM relative to low inflation years has been estimated just for illustrative purpose, given that its smaller underlying data sample strongly limited its statistical robustness. Eventually, it has not revealed any particular feature associated with low inflation years that could be used for policy purposes.

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[17] Part of the explanation could be that the old CPI (based in 1996) could not capture the full intensity of inflation during the SDYs.

[18] The regression is based on monthly data covering the period January 2010–December 2011. The data on the curb market exchange are monthly and date back to January 2010. While there are no data on the curb market exchange rate prior to 2010, there are indications that the premium was minor, in the order of 3 percent or less.

H. Conclusion and Policy Recommendations

39. Our statistical and econometric analysis of inflation in Sudan has underscored that its key determinants are reserve money, the exchange rate, fiscal monetization, and wage policy. While fiscal policy seems to have a limited direct effect, its indirect impact through the government's wage policy, and its presumed impact on national wages and the monetization of the budget deficit, are substantial. Inflation in Sudan is also characterized by a domestic cost dynamic largely influenced by the external environment, which underscores the open nature of Sudan's economy.

40. Over the past 14 years high inflation was contained thanks to the oil windfall, which provided the necessary financing for both the budget and the BOP and allowed an overall improvement in living standards. Policymakers were not under pressure to solve the inflation problem as there was no need and/or pressure to improve competitiveness and enhance import substitution, or to expand the tax base and improve revenue collection: the oil windfall was doing the job.

41. However, following South Sudan's secession, Sudan entered a new era which requires changing course to adapt to its reduced economic and financial potential. To do so, Sudan has to rely on adjustment measures and endogenous resources to finance its budgetary and resource requirements. In this context, keeping inflation in check appears as the key policy target for stabilizing the macroeconomy, containing labor costs, and eventually enhancing competitiveness and improving the external current account.

42. The reform program that was adopted by the government in June 2012 is a first positive step towards addressing the adverse effects of South Sudan's secession. Consolidating public finances, rebalancing the country's external accounts, and bringing inflation under control will necessitate a strong and determined implementation of the government reforms and a diligent continuation of the adjustment efforts over the medium term.

43. In particular, reining in inflation will require a fruitful and close cooperation between the central bank and the ministry of finance. Based on the outcome of the above analysis two out of the three key determinants of inflation in Sudan (money supply and exchange rate) are under the control of the central bank, while the third (wage policy) is the responsibility of the ministry of finance. This outcome emphasizes the need to enhance the role of the central bank by, among other measures, increasing its independence.

APPENDIX II. TABLES

Appendix II. Table 1. GDP by Main Sectors

	1996-00	2001--05	2005--10	1996-10
	(In percent of GDP at fc)			
GDP at fac	100.0	100.0	100.0	100.0
Agricultu	44.6	36.8	26.5	31.5
Mining a	15.8	22.3	27.4	24.6
Of whic	2.7	11.8	17.8	14.3
Trade an	27.8	27.7	32.8	30.8
Other Se	11.8	13.2	13.3	13.1
Genera	7.9	7.0	8.2	7.9
Other	3.9	6.1	5.1	5.2

Source: Central Bureau of Statistics; and Staff estimates.

Appendix II. Table 2. Oil Sector's Fiscal and External Predominance

(In percentage)

	1999-00	2001--05	2005--10	2010	1999-10
Fiscal sector					
Oil revenues/Total revenues and grants	27.7	48.0	48.4	45.2	47.2
Oil revenues/Total expenditure	28.7	54.7	41.8	37.2	43.6
Nonoil revenues/Total expenditure	75.1	59.1	44.4	45.1	48.8
External sector					
Oil exports / total exports of g & s	63.0	81.1	88.1	84.9	85.6
Oil exports receipts/ total ca receipts	39.4	55.2	66.8	66.9	62.8
Oil exports / total ca payments	38.2	46.5	57.7	68.8	54.2
Nonoil imports/Nonoil GDP at fc	11.7	18.5	18.7	15.7	18.2
Nonoil exports /Nonoil imports	40.9	18.4	15.6	22.9	17.5

Sources: CBOS; and staff estimates.

Appendix II. Table 3. Sudan: CPI Basket by main Categories

Tradable goods	65
O/w: Food and beverages	53.6
Furniture and equipment	6.9
Clothing and footwear	4.5
Non tradable goods	35
O/w: Housing	14.2
Transportation and communications	10
Other services	10.8
Total goods	100

Source: Central Bureau of Statistics

Appendix II. Table 4. Inflation profile, 1997–2011

(In percentage)

	DDYs 1/	SDYs 2/	1997-2011
Total CPI	15.8	6.7	12.6
Tradable goods	15.8	4.8	11.9
Of which: Food	17.0	7.1	13.5
Non tradable goods	15.2	7.7	12.5
Non tradable goods- Market	14.7	6.9	11.3
Non tradable goods- Non market	15.8	11.7	13.8

Source: Central Bureau of Statistics

1/ DDYs are the years 1998, 1999, 2002, 2007, 2008, 2009, 2010 and 2011.

2/ SDYs are the years 2000, 2001, 2003, 2004, 2005, and 2007.

Appendix II. Table 5. Inflation in Sudan: Dispersion Parameters

Low inflation Years VS High Inflation Years, Monthly

	Total	Food	Tr.	N.Tr.	N.Tr.m	N.Tr.nm
Low inflation years						
Mean	0.51	0.52	0.31	0.75	0.56	0.94
Median	0.4	0.0	0.0	0.4	0.3	0.6
Coefficient of variation	7.7	12.5	15.3	2.3	3.9	2.7
Range	33.1	55.0	39.1	8.7	13.0	15.2
Number of observations	60	60	60	60	60	60
High inflation years						
Mean	1.29	1.48	1.31	1.14	1.20	1.18
Median	0.75	1.17	1.03	0.34	0.34	0.25
Coefficient of variation	2.52	3.30	2.73	2.77	4.54	3.04
Range	23.8	41.4	27.9	29.2	61.1	31.8
Number of observations	108	108	108	108	108	108
High Inflation/Low Inflation						
Mean	2.5	2.8	4.3	1.5	2.1	1.3
Coefficient of variation	0.3	0.3	0.2	1.2	1.2	1.1
Range	0.7	0.8	0.7	3.4	4.7	2.1

III. ASSESSING SUDAN'S EXTERNAL COMPETITIVENESS[1]

While acknowledging data caveats and uncertainties surrounding the secession of South Sudan in July 2011, this analysis finds some vulnerabilities and secession-induced permanent adjustment needs that could undermine Sudan's near- and medium-term external competitiveness and stability:

- *External sector performance* crucially depends on natural resources (oil and now also gold), raising concerns over Sudan's competitiveness (of traditional exports) and increasing the vulnerability to external shocks.
- *Price competitiveness* has long been undermined by an overvalued real effective exchange rate (REER), partly remedied by the reforms adopted at end-June 2012.
- *Non-price competitiveness* suffers from significant structural and institutional bottlenecks, making the case for substantial structural reforms to improve the business climate.

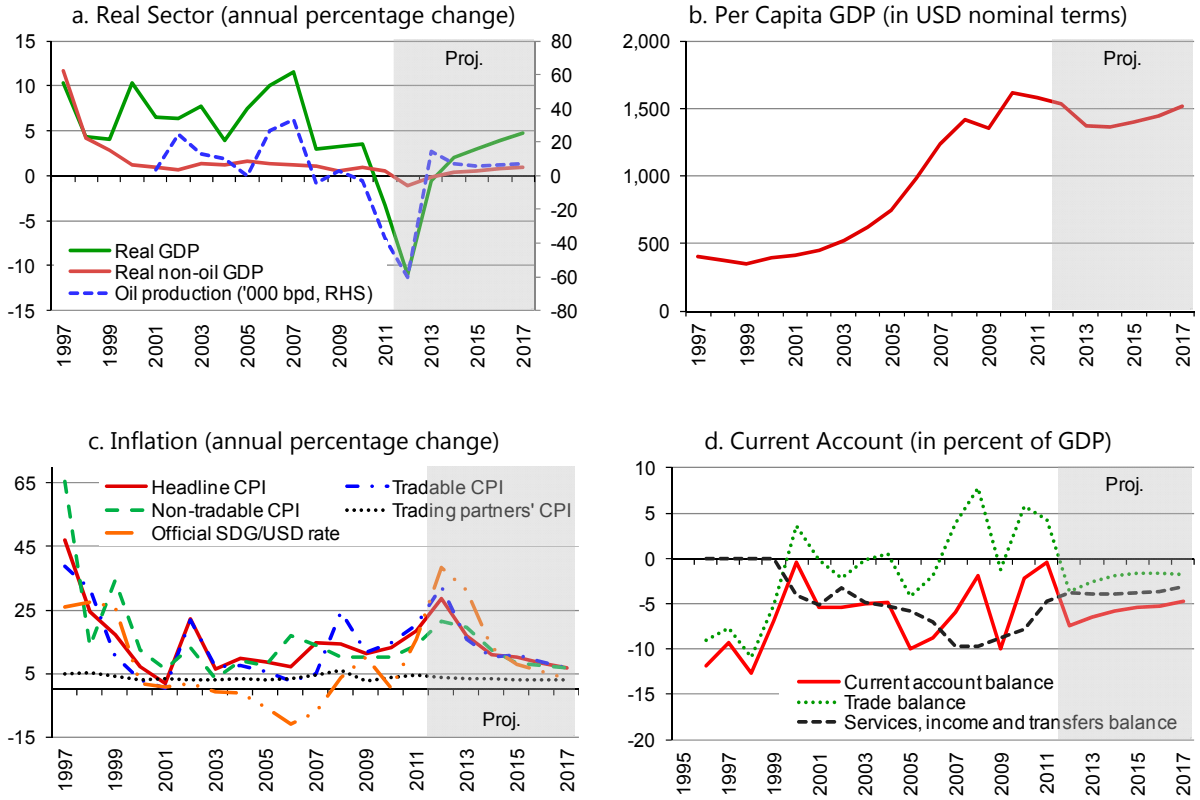
A. Background

1. Until recently, Sudan was an oil-exporting low-income country (LIC) with a history of mixed macroeconomic performance. In the mid-1990s, the predominantly agricultural economy with a large and inefficient public secor was in economic distress. The narrow revenue and export base was insufficient to finance large fiscal expenditure and balance of payments (BOP) needs. Large fiscal deficits were monetized by the CBOS, while external arrears were building up. Inflation reached triple digits and the premium on the dollar on the curb market was in the double digits. Supported by Fund re-engagement in 1997, the authorities' decisive reform efforts and the coming on stream of oil production in 1999 helped restore macroeconomic stability. For more than a decade, real growth was strong and non-oil growth robust (Figure III.1.a), almost quintupling per capita GDP by 2010 (Figure III.1.b). Oil production remained modest in the real sector (accounting for about 16 percent of total GDP in 2010), but crucial in the financing of the budget and the BOP (covering about 50 percent of current spending and imports of goods and services in 2010, respectively).[2] Thanks to curtailed fiscal deficits and tightened monetary policy, average annual inflation remained contained at around 10 percent until the food and fuel price shocks in 2008 (Figure III.1.c). The exhange rate was gradually depreciated and the current account deficit returned to single digits (Figure III.1.d).

[1] Prepared by Kerstin Gerling.

[2] Sudan's fiscal dependence on oil revenues lesened in 2005, when the Comprehensive Peace Agreement entitled what is South Sudan today to withhold roughly half of the proceeds of oil produced in the South.

Figure III.1. Key Macroeconomic Developments



Sources: Sudanese authorities, WEO, and IMF staff calculations.

2. The secession of South Sudan in July 2011 resulted in a major permanent external shock to Sudan, leading to a deterioration in economic condition similar to that of the early 1990s. The loss of about three quarters of the country's oil production hit the real sector as well as the fiscal and external sectors (Figure III.1.a): it left Sudan with roughly half of its previous fiscal revenues and a third of export proceeds. Macroeconomic fundamentals deteriorated, putting severe pressures on the fiscal position and the exchange rate. As in the mid-1990s, the authorities resorted to monetizing the fiscal deficit, driving up inflation and widening the spread between the official and the curb exchange rates. Continued uncertainties as to future relations with South Sudan have further aggravated the situation.

3. At end-June 2012, the Sudanese authorities embarked on a reform path, aiming at addressing the macroeconomic imbalances resulting from the secession of South Sudan. The key measures adopted are: (i) a devaluation of the Sudanese pound and the reform of the exchange rate regime; (ii) an increase in taxes; (iii) a reduction of fuel subsidies and non-priority spending; and (iv) an expansion of social safety nets. While these measures will help reduce near-term pressures and improve the economic outlook, over the medium term there is a need to continue these reforms in order to restore domestic and external stability.

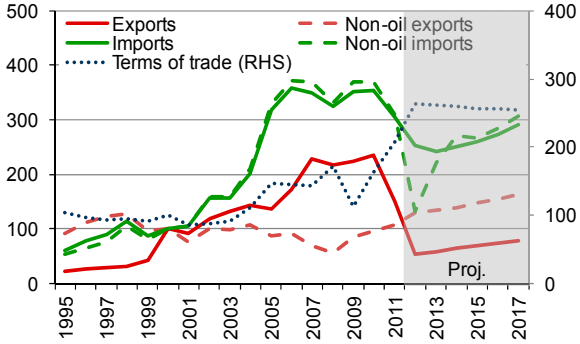
B. External Competitiveness

External Sector Performance

4. Sudan's historically narrow and undiversified export and FDI bases raise concerns over its external competitiveness and stability. After the coming on stream of oil in the late 1990s, the expanding oil production had been driving export (Figure III.2) and FDI dynamics (Figure III.3.c) until the secession in July 2011. Nonetheless, persistently narrow export and FDI bases, mainly built on dwindling natural resources, hint at the lack of competitiveness in other exports and indicate vulnerability to external (especially terms of trade) shocks.

Figure III.2. Trade Volumes and Terms of Trade

(Index, 2000=100)



Sources: Sudanese authorities, WEO, and IMF staff calculations.

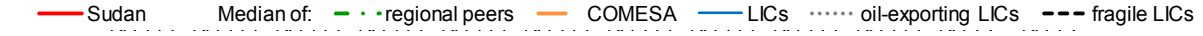
- Relative to its peers,[3] Sudan's share of world total exports had steadily increased, while its share of world non-oil exports had decreased (Figure III.3.a and b). After the secession of South Sudan, total exports dropped with the loss of oil, masking a pickup in non-oil exports thanks to stronger gold proceeds. Meanwhile, for more than a decade, non-oil-non-gold exports have remained chronically low at less than 10 percent of total exports (Figure III.4). At the same time, while Sudan's total FDI inflows seem to outperform those of its peers, only 10 percent of total FDI went to the non-oil sector.

- The normalized Herfindahl-Hirschman Index (HHI) not only confirms a relatively high export concentration across commodity groups, but also across destination countries (Figure III.5).[4] China had become the main export destination (accounting for nearly 70 percent of total exports in 2010). Preliminary data hint at the net impact of the loss of oil and increase in gold as slightly reducing export product concentration, whilst tilting export destination concentration toward Gulf countries.

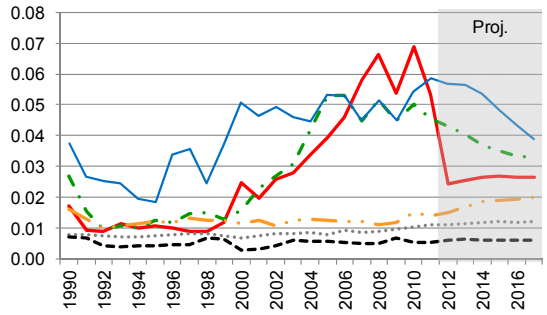
[3] The peer groups are (i) regional peers (i.e., Angola, Central African Republic, Chad, Egypt, Equatorial Guinea, Eritrea, Ethiopia, Nigeria, Yemen); (ii) members of the Common Market for Eastern and Southern Africa (COMESA); (iii) LICs; (iv) oil-exporting LICs; and (v) fragile LICs (see World Bank, 2012a). The LIC group comprises those countries currently eligible for the Fund's Poverty Reduction and Growth Trust (PRGT), whereof the *World Economic Outlook (WEO)* considers four to be oil exporters (Republic of Congo, Nigeria, Sudan, and Yemen). The peer group median excludes Sudan.

[4] The HHI is defined as the sum of the squares of the shares of commodity groups or destination countries.

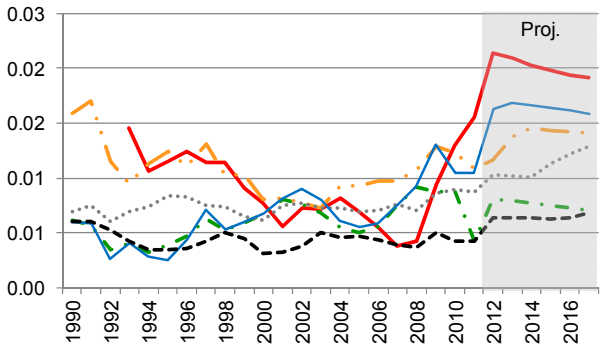
Figure III.3. Cross-Country Comparison of Exports and FDI



a. Total World Export Shares (In percent)



b. World Non-Oil Export Shares (In percent)



c. FDI (In percent of GDP)

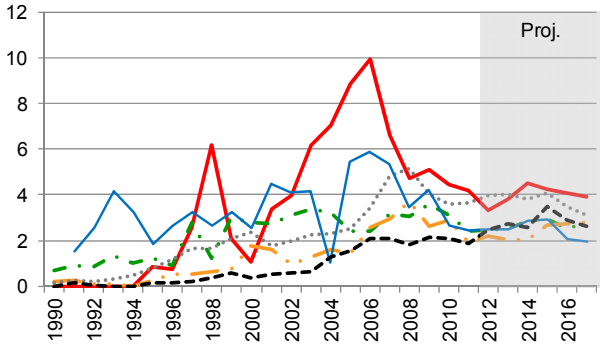
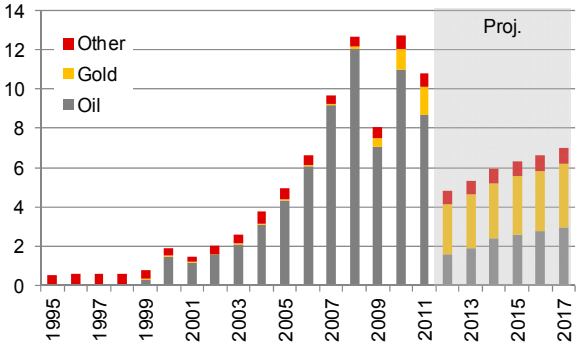


Figure III.4. Export Structure

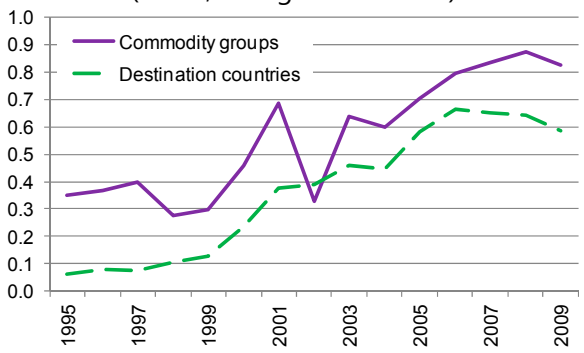
(In Billions of USD)



Source: Sudanese authorities, and IMF staff calculations.

Figure III.5. Export Concentration

(Index, 1=high and 0=low)



Source: UN Comtrade, and IMF staff calculations.

C. Price Competitiveness

Exchange Rate Regime and Developments

5. After the de facto peg to the USD for most of the recent past, the measures introduced at end-June 2012 effectively reinstate Sudan's official managed floating exchange rate regime.[5] Notwithstanding the authorities' stated objective, the monetary policy framework was until recently a de facto exchange rate anchor of the Sudanese guinea (SDG) vis-à-vis the USD.[6] The official exchange rate was last depreciated by 0.06 USD to 2.67 to the USD in April 2011. Yet, the secession of South Sudan weakened the CBOS ability to manage the de facto peg. Furthermore, the introduction of administrative measures and exchange restrictions during 2011 fostered the expansion of the parallel foreign exchange market. This finally led the authorities to devalue the Sudanese pound and reform the exchange rate regime (Box III.1).

Box III.1. Current Exchange Rate Regime

On June 25, 2012, the Sudanese authorities step-devalued the central rate and centered the exchange rate system on the following four rates:

- the central rate was CBOS' only official rate previously and applies to its foreign exchange purchases. It was devalued by 66 percent from SDG 2.67 to 4.42 per USD and now also applies to the settlement of government obligations, import of fuel products, and valuation assessment at customs;
- a newly introduced subsidized rate for wheat of SDG 2.9 per USD;
- a newly introduced gold rate used by CBOS to purchase gold, which is close to the curb rate; and
- the commercial banks rate which is no longer set equal to the CBOS rate plus a premium determined by the central bank,[1/] but instead is allowed to follow an iterative crawling peg to achieve some floating. It is calculated as: (i) the indicative rate (which equals the weighted average of the previous day's central rate and average commercial banks rate excluding the premium), (ii) plus the premium set by the central bank (currently 15 percent), and (iii) a flexibility factor of +/-4 percent allowing banks to deviate from the sum of the indicative rate and the incentive premium.

1/ In November 2010, CBOS introduced an exchange subsidy by authorizing banks and foreign exchange bureaus to buy foreign exchange at a premium above their buying rates. CBOS determines the premium, which was gradually revised downwards from, initially, about 19 percent to 4.77 percent in May 2011.

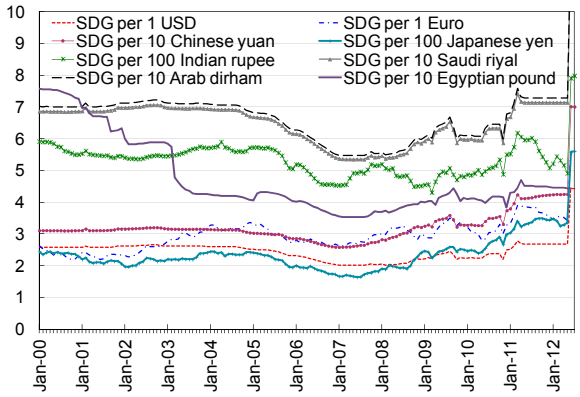
[5] See IMF (2011a). The de facto exchange rate arrangement has been reclassified retroactively from *floating* to *other managed arrangement*, effective December 1, 2009.

[6] The SDG/USD rate was determined through direct transactions between participants in the interbank market. Yet, CBOS participated in the market through swaps under a rules-based mechanism that triggers interventions if the exchange rate exceeds a band of ±3% around the previous day's closing rate. The main objective of the policy was to achieve exchange rate stability. The CBOS does not publicly disclose information on its interventions.

6. After a decade of widespread tamed exchange rate fluctuations, the SDG's bilateral exchange rates vis-à-vis major trading partners depreciated again (Figure III.6). The SDG experienced a temporary appreciation trend after the Comprehensive Peace Agreement was signed in 2005. Nonetheless, depreciation pressures resumed with increased inflation during the 2008 food and fuel price crisis, and amidst increased uncertainties about the future of the country starting in 2010, finally culminating in the referendum over South Sudan's secession in January 2011. During the 12 months prior to the June 2012 devaluation, the SDG has roughly kept its value against most trading partners' currencies, while sizably appreciating against the Euro and the Indian rupee(Table III.1). In 2011, the main trading partner was China (with a trade share of 46 percent), followed by Japan, the Euro Area, India, Saudi Arabia, the United Arab Emirates and Egypt (with trade shares ranging between 3 and 8 percent, respectively, for the last two).[7]

Figure III.6. SDG Bilateral Exchange Rates Against Major Trading Partners' Currencies

(Period averages, 2000M1–2012M7)



Sources: IFTS; and IMF staff calculations.

Table III.1. Trade Shares and Year-on-Year SDG Value Change Against Major Trading Partners' Currencies

(In percent)

Country	Trade Share 2011	2012M7 Year-on-Year De-/Appreciation (+/-)
USA	0.4	65.5
Euro Area	7.3	42.7
UK	2.1	60.0
China	0.0	69.1
Japan	3.3	66.4
Egypt	3.1	63.2
Saudi Arabia	4.6	65.5
UAE	12.8	65.5
India	3.4	32.5

Sources: IFTS; and IMF staff calculations.

Exchange Rate Assessment

7. The exchange rate assessment for Sudan suggests an overvaluation of the SDG. With conceptual and methodological obstacles preventing a formal empirical analysis based on the Consultative Group on Exchange Rates (CGER) approach,[8] the assessment relies on available

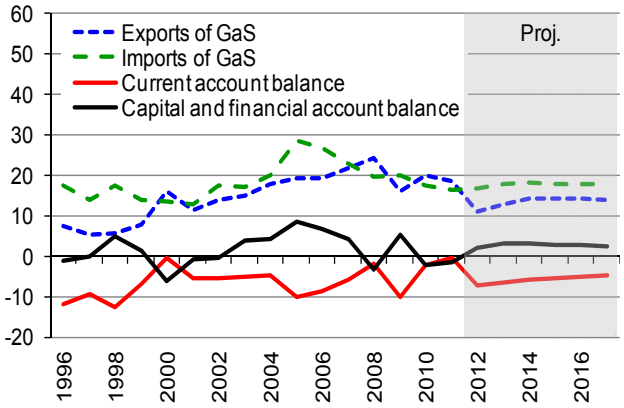
[7] Bilateral trade shares remained roughly constant in recent pre-secession years. Preliminary post-secession data, however, show that Gulf countries are becoming the main trading partners.

[8] Data limitations are severe, including short time series and structural breaks (e.g., the secession of South Sudan in mid-2011) and volatility (e.g., terms of trade shocks, institutional changes, market imperfections, volatile financing flows, multiple exchange rate practices, and capital controls). Besides, significant uncertainties complicate the outlook (especially earnings from mineral resources and from a potential transitional financial agreement with South Sudan). For a general discussion of issues complicating REER assessments in LICs in general, see, e.g., Di Bella et al. (2007).

exchange rate surveillance indicators. Those point to the value of the SDG having already been out of line with its medium-term economic fundamentals for a sustained period. Even though recent reforms significantly helped reduce the overvaluation, it appears to linger as indicated by: (1) unsustainable BOP dynamics; (2) persistent exchange rate overvaluation; (3) low reserves resulting from protracted large-scale exchange market interventions in one direction; (4) imposition of administrative measures and restrictions of access to foreign exchange to ease pressures on the SDG value and on international reserves; and (5) growing external arrears adding to an already unsustainable external public debt burden.

8. Indicator 1—unsustainable BOP dynamics. Over the past decade, the current account deficit (including official grants) has averaged some 5 percent of GDP. It was mainly financed by FDI (of which 90 percent went to the oil sector) and accumulation of arrears, and less by aid. This has intensified the strain on already low reserves and increased pressure on the exchange rate (Figure III.7 and Table III.2), BOP dynamics have worsened with the South Sudan secession-induced drop in oil exports and FDI, which was only partly compensated by a recent pickup in gold exports. Meanwhile, imports have been holding up, indicating the impact of an exchange rate overvaluation. Although the recent exchange rate depreciation will to some extent help rebalance the BOP and ease pressures on reserves, adequate exchange rate flexibility is warranted over the medium term to help restore external sustainability.[9]

Figure III.7. BOP Dynamics
(In percent of GDP)



Sources: Sudanese authorities; and IMF staff calculations.

Table III.2. Selected Balance of Payments Indicators (In percent of GDP)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
													Proj.					
Current account balance (excl. official grants)	-0.6	-5.4	-5.6	-5.1	-5.0	-10.9	-10.8	-7.2	-3.2	-11.2	-4.0	-1.5	-8.8	-7.9	-7.2	-6.7	-6.4	-5.8
Current account balance (incl. official grants)	-0.4	-5.4	-5.4	-5.0	-4.9	-10.0	-8.8	-5.9	-2.0	-10.0	-2.1	-0.5	-7.4	-6.5	-5.8	-5.4	-5.2	-4.8
Official aid flows	0.3	0.1	0.3	0.2	0.4	1.3	2.5	1.7	1.6	1.9	2.1	1.4	2.1	1.9	1.9	1.8	1.7	1.5
Capital and financial account balance	-6.1	-0.9	-0.6	3.7	4.3	8.7	6.9	4.1	-3.5	5.3	-2.2	-1.5	2.1	3.1	3.0	2.9	2.9	2.5
o/w: FDI flows	*1.0*	*3.4*	*3.9*	*6.2*	*7.0*	*8.9*	*10.0*	*6.7*	*4.8*	*5.1*	*4.5*	*4.1*	*3.5*	*3.3*	*2.6*	*2.1*	*1.7*	*1.4*
Financing	12.9	7.1	5.6	5.0	2.6	4.3	4.2	4.9	1.5	4.6	7.1	3.2	3.9	3.3	2.8	2.6	2.4	2.2
o/w: in-/decrease in useable reserves (-/+)	*-0.4*	*1.0*	*-2.0*	*-2.4*	*-3.6*	*-3.1*	*1.1*	*0.9*	*-0.2*	*0.8*	*-0.3*	*0.4*	*0.5*	*-0.2*	*-0.3*	*-0.3*	*-0.3*	*-0.2*
o/w: increase in arrears	*14.1*	*6.6*	*8.1*	*8.2*	*6.4*	*7.7*	*3.7*	*4.1*	*2.2*	*3.9*	*7.4*	*2.8*	*3.0*	*3.3*	*3.3*	*3.1*	*2.9*	*2.7*
Reserve coverage (in months of imports)	2.0	0.7	1.7	2.4	2.6	3.1	2.4	1.9	2.1	1.5	1.8	1.8	1.5	1.6	1.7	1.8	1.9	1.9

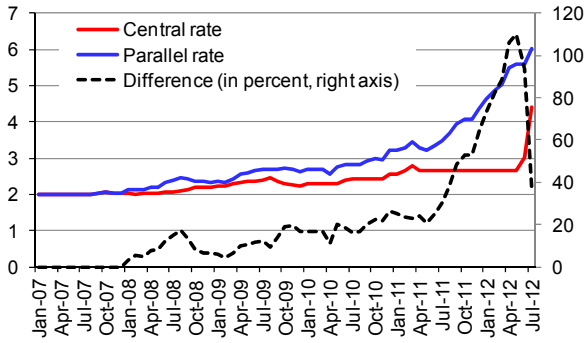
Sources: Sudanese authorities; and IMF staff calculations.

[9] The existence of severe foreign exchange restrictions, multiple currency practices, and parallel exchange rate markets prevents a meaningful calculation of elasticities and, consequently, of the needed extent of exchange rate adjustment.

9. Indicator 2—persistent exchange rate overvaluation, as indicated by relative price measures: (i) curb market rate premium, (ii) REER, and (iii) internal terms of trade.

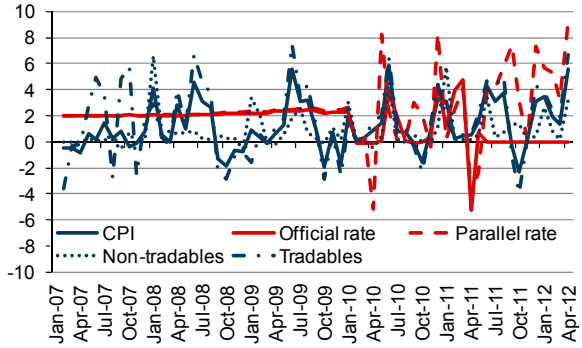
(i) After steady increases to about 100 hundred percent, the June 2012 devaluation substantially reduced, though it did not eliminate, the SDG/USD premium on the curb market (Figure III.8): in July 2012, it remained at 37 percent of the CBOS's central rate and 13 percent of the commercial banks' rate. This put some degree of a halt to the rise of the curb market, which had slowly started with the divergence of the central and curb market rate in early 2008 and accelerated sharply in April 2011. With CBOS unable to meet the country's foreign exchange demand, the curb market was booming, reinforcing the role of the curb rate as the economy's leading rate, which had depreciated sharply, reflecting the loss of oil export proceeds and mounting uncertainties about Sudan's economic prospects. Available data suggest that domestic prices (of both tradables and nontradables) also tended to move with the curb rate rather than with the central rate (Figure III.9); this movement has prevented an overshooting of the curb rate in the aftermath of the depreciation on June 25, 2012 (Figure III.10).

Figure III.8. SDG/USD Exchange Rates
(Monthly Average 2007M1-2012M7)



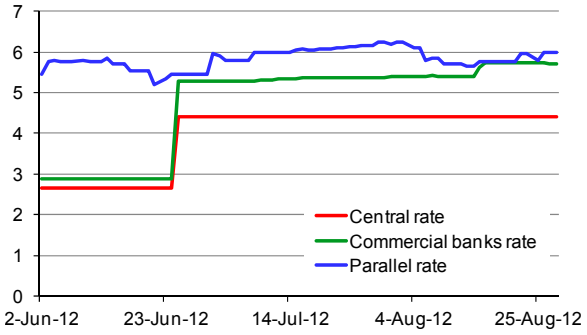
Sources: Sudanese authorities; and IMF staff calculations.

Figure III.9. Domestic Price and Exchange Rate Changes
(Percent, 2007M1–2012M6)



Sources: Sudanese authorities; and IMF staff calculations.

Figure III.10. SDG/USD Exchange Rates
(Daily June 2–August 28, 2012)



Sources: Sudanese authorities; and IMF staff calculations.

(ii) The June 2012 depreciation also significantly reduced, but most likely did not fully eliminate, the double-digit overvaluation of the REER. Since 1999, the purchasing power parity (CPI)-based REER had been on an appreciating trend, and the nominal effective exchange rate (NEER) on a depreciating trend (Figure III.11). These trends reflect improved macroeconomic fundamentals around the coming on stream of oil and the stabilized exchange rate in the presence of high inflation relative to trading partners. However, with economic fundamentals worsening after the secession of South Sudan, the REER up to the last available observation in June 2012 (just predating the exchange rate reforms) seemed increasingly overvalued:

- *The June 2012 REER ranged some 21 to 65 percent above* historical *averages.* After some depreciation starting in mid-2010, the official SDG rate had seen an appreciation in nominal and real effective terms again, for the most part even more than in other oil-exporting LICs (except for Angola; see Figure III.11b). At end-2011, the REER had almost reached its historical peak in November 2010 again, while the NEER stood at an all-time low. This left the June 2012 REER well above any historical averages and NEER below most of them (see text Table). As this REER appreciation did not correspond to gains in productivity, but was rather driven by chronically high inflation, the appreciation has eroded external price competitiveness. The June 2012 depreciation will likely have corrected for the bulk of the overvaluation. However, the macroeconomic outlook relative to trading partners (see the persistent inflation differential in Figure III.1.c) suggests that some overvaluation pressures will persist, requiring nominal depreciation.

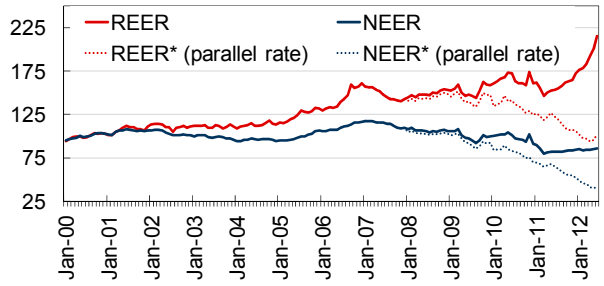
Average (Years)	Deviation from Average (Percent)	
	REER	NEER
20	65.3	-90.4
15	69.5	-18.4
10	54.5	-14.4
5	36.1	-14.2
1	21.3	2.5

- Besides, the June 2012 REER also ranged 110 percent above the real exchange rate calculated based on the curb exchange rate (henceforth labeled REER*). The reason is that in contrast to the REER, the REER* had been on a depreciation trend since early 2008

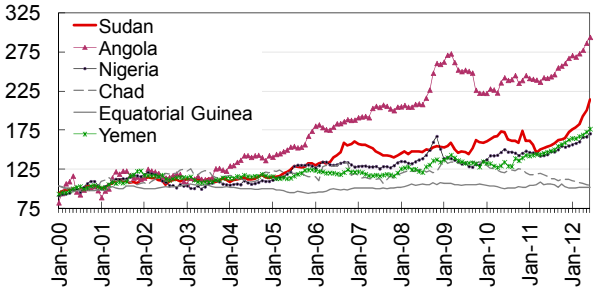
(Figure III.11a), reflecting the depreciating curb rate in line with deteriorating fundamentals. The June 2012 REER* remained well below historical averages. The evolution of the REER* suggests that, if left to operate freely, market forces would have already restored external price competitiveness by reversing the REER overvaluation.

Figure III.11. Real Exchange Rate Developments (2000M1-2012M6)

a. Sudan's NEER and REER (Index, 2000=100)



b. Competitor Countries' REER (Index, 2000=100)



Sources: EER; INS; and IMF staff calculations.

- Finally, the June 2012 REER had some 32 percent to depreciate as suggested by a cross-country comparison accounting for Balassa-Samuelson effects (Figure III.12). Based on 2011 data, Sudan's real exchange rate (proxied by the market exchange rate relative to the PPP exchange rate) was 32 percent higher than the level suggested by its relative productivity (proxied by relative income).[10] Based on 2010 data, the difference was 30 percent. This suggests that given its relative income level, Sudan has been suffering from a too-high overall price level. With the price level of tradables being commonly determined by world market prices, this points to Sudan's price level of nontradables being too high relative to that of other countries'.

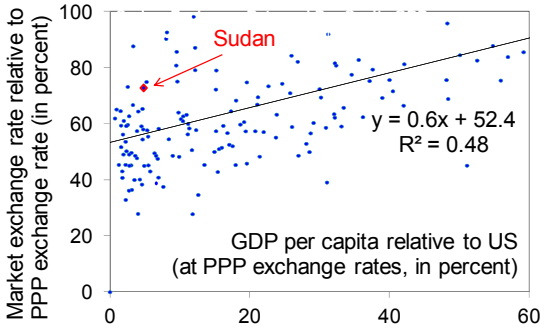
(iii) *Deteriorating internal terms of trade (ITT).*[11] *ITT dynamics go opposite to the REER's, but in* line *with the REER*'s* (Figure III.13 versus Figure III.11), providing further evidence for the longstanding leading role of the curb rate. In fact, despite administered and thereby contained petroleum product prices, the overall price index of tradables has been increasing in a stronger and more volatile way than the price index of nontradables (Figure III.9)—an increase of 21 and 16 percent in 2011, respectively and of 27 and 13 percent, respectively over the 12 months preceding the June 2012 depreciation.

[10] The Balassa–Samuelson effect claims that productivity increases in the tradable sector relative to the nontradable sector—if higher than abroad—cause real exchange rate appreciation. This explains the observation that in poor countries, average prices are lower and real incomes therefore higher than they would appear from simply converting prices in rich countries at nominal exchange rates.

[11] ITT is defined as the ratio of the price of nontradables to that of tradables.

Figure III.12. Exchange Rate and Per Capita GDP

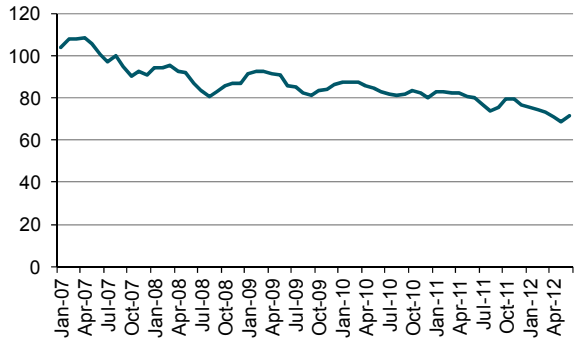
(2011, cross-country comparison)



Sources: WEO; Sudanese authorities; and IMF staff calculations.

Figure III.13. Internal Terms of Trade Index

(2007=100, 2007M1–2012M6)



Sources: Sudanese authorities; and IMF staff calculations.

10. Indicator 3—chronically low international reserve levels owing to protracted large-scale exchange market interventions in one direction. For decades, reluctance to allow sufficient exchange rate flexibility—and consequent need to support the official exchange rate—has kept reserves well below both the minimum of three months of prospective imports (Figure III.14) and the current optimal level of more than four months of 2011 imports (depending on the opportunity cost of capital).[12] Reserves sharply started out toward new lows shortly before the secession and later with the oil-related loss of the bulk of the foreign exchange accumulation base, in turn further constraining CBOS' ability to manage the official rate and deteriorating resilience to exogenous shocks.[13] Reserves only very recently somewhat stabilized, reflecting the exchange rate policy reforms introduced at end-June and the receipt of significant bilateral BOP support (Figure III.15). Nevertheless, even in the presence of sufficient exchange rate flexibility, rebuilding reserves from own means will remain challenging.

11. Indicator 4—imposition of administrative restriction of access to foreign exchange for current account transactions. Aiming at stabilizing the currency and limiting the depletion of official reserves, the authorities have been imposing exchange restrictions.[14, 15] These first include,

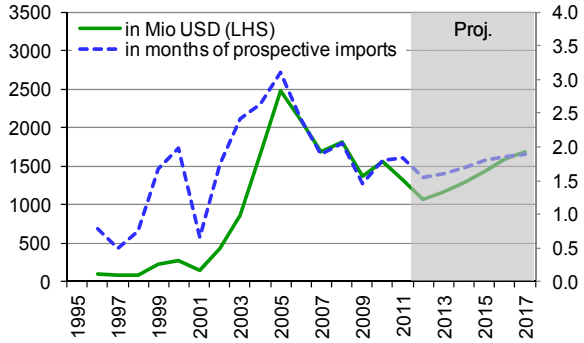
[12] See the reserve adequacy assessment in the Appendix.

[13] Rare monthly intervention data confirms net sales of foreign exchange amounting to US$147 million in January 2012 (with gross purchases amounting to US$5 million only), up from US$110 million in the previous month. Available data suggest that net sales have been reduced in recent months. This mainly reflects CBOS' policy of allowing banks and foreign exchange bureaus to trade at rates close to the curb market rate for specific categories of transactions and then expecting them to meet their foreign exchange needs through their own resources.

[14] Especially when not applied temporarily, restrictions prove inefficient and costly. They hamper productivity (by inciting trade flows redirection, product substitution, and corruption) and erode investor confidence, fuelling capital flight and dollarization.

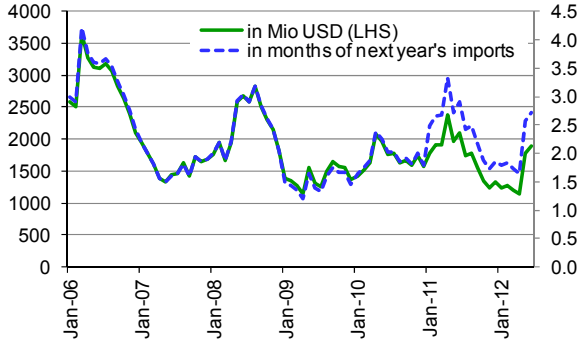
for instance, a limit on foreign exchange for travel purposes and the imposition of a 100 percent cash margin for letters of credit on most imports, rationing of foreign exchange and its earmarking to selected sectors, controls on the repatriation of profits of foreign-owned companies operating in Sudan, and restrictions on banks' excess reserves in foreign currency with CBOS. In the context of the recent reforms, the authorities have abolished some restrictions. Gradually phasing out remaining and newly instated restrictions will, however, be key to restoring the efficient functioning of the foreign exchange market and the accuracy of price signals.

Figure III.14. Annual Stock of Usable Reserve Assets



Sources: Sudanese authorities: and IMF staff calculations.

Figure III.15. Monthly Stock of Usable Reserve Assets (2006M1–2012M6)



Sources: Sudanese authorities; and IMF staff calculations.

12. Indicator 5—growing external arrears adding to an already unsustainable external debt burden. At end-2011, total external debt amounted to about US$41.4 billion (i.e., 65 percent of GDP or 350 percent of exports of goods and services), of which almost 85 percent was in arrears. Public and publicly guaranteed external debt accounted for 96 percent of total external debt and has only partially been serviced for decades. In the absence of massive debt relief, Sudan continues to be in debt distress, with limited prospects for improvement over the medium and long term. Consequently, access to external financing remains very limited.

External Non-Price Competitiveness

13. Sudan's competitiveness also suffers from structural impediments. These inhibit its ability to produce goods and services of international quality more cost effectively than other countries. Progress in creating a stable, competitive, and diversified economy hinges on expediting reforms.

14. Both relative to historic performance and peers, structural competitiveness in Sudan is either stagnating or deteriorating. Available survey-based business and governance

[15] These restrictions were approved by the IMF Board until end-June 2010 in light of the authorities' intention to eliminate them. An assessment is currently under way of the implications of the recent exchange rate regime reforms on Sudan's compliance with its obligations under Art. VIII of the Fund's Articles of Agreement.

indicators identify cost-increasing production factors that adversely affect productivity and, thus, overall economic activity.[16] More specifically:

(i) *World Bank's Doing Business Indicators (DBIs).* Sudan ranks in the upper lowest third of countries assessed and in the midfield among its regional competitors. Since last year, Sudan did not change its overall ease of doing business rank, but it lost ranks on most sub-indicators. Priority structural areas for improvement are access to credit, trading across borders, investor protection, and the enforcement of contracts. At the same time, Sudan scores relatively well on registering property and resolving insolvency.

Table III.3. Doing Business Indicators (2012, Rank out of 183 Countries)

	Ease of Doing Business	Starting a Business	Dealing with Construction Permits	Getting Electricity	Registering Property	Getting Credit	Protecting Investors	Paying Taxes	Trading Across Borders	Enforcing Contracts	Resolving Insolvency
Sudan	135	126	130	107	41	166	155	103	151	148	84
Sudan 2011	*135*	*123*	*127*	*104*	*40*	*152*	*153*	*99*	*151*	*146*	*84*
Median											
Regional Peers	155	160	115	101	129	98	122	145	157	97	160
COMESA	124	132	109	129	109	126	97	75	153	121	141
LICs	139	110	114	127	121	126	122	113	132	116	127
Oil-Exporting LICs	133	116	84	152	156	98	133	138	149	97	114
Fragile LICs	168	149	136	117	152	126	133	121	145	142	158
Regional Peers											
Angola	172	167	115	120	129	126	65	149	163	181	160
CAR	182	160	136	162	132	98	133	177	182	173	183
Chad	183	183	122	117	143	98	155	180	178	163	183
Egypt	110	21	154	101	93	78	79	145	64	147	137
Equatoria Guinea	155	178	100	88	80	98	147	167	134	74	183
Eritrea	180	182	183	96	178	177	111	121	165	47	183
Ethiopia	111	99	56	93	113	150	122	40	157	57	89
Nigeria	133	116	84	176	180	78	65	138	149	97	99
Yemen	99	66	35	52	55	159	133	116	118	38	114

Sources: World Bank (2012b); and IMF staff calculations.

(ii) *World Bank's Worldwide Governance Indicators (WGIs).* For nearly a decade, Sudan's already weak governance indicators have been fluctuating mostly below their 2002 levels, widening the gap with its peers (Figure III.16). Most notably, Sudan's political instability and violence have worsened in absolute and relative terms.

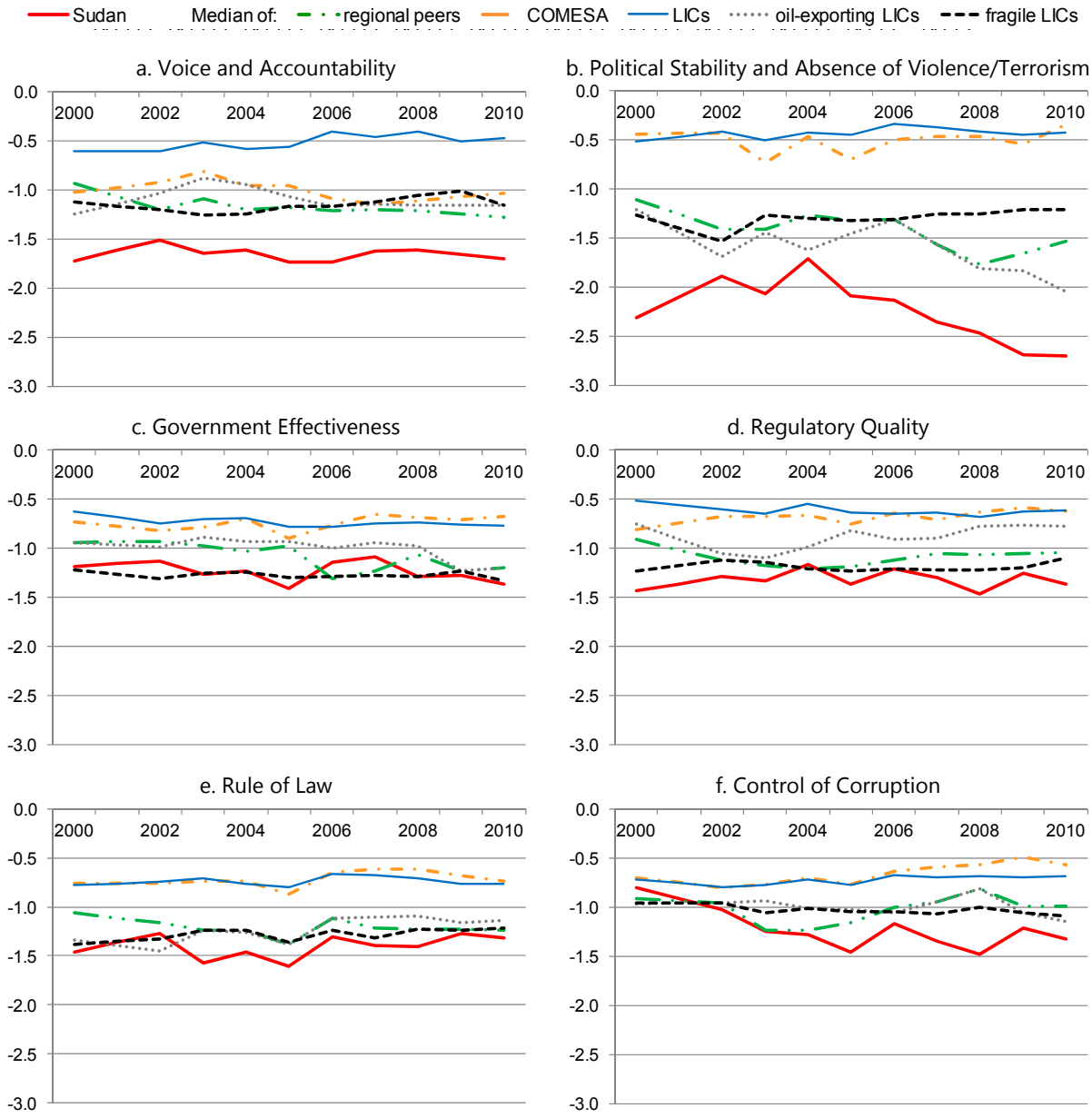
(iii) *World Bank's Country Policy and Institutional Assessment Ratings (CPIA).* For nearly a decade, Sudan's CPIA has been weak and on a slow downswing to 2.36. This is well below the threshold for medium performers (3.25) and well below its peers (Table III.4). The low quality of Sudan's policy and institutional framework thus continues to impede poverty reduction, sustainable growth, and the effective use of development assistance. Sudan's CPIA clusters (Figure III.17) show that the most recent decline of the overall CPIA mainly stems from a deterioration of the score for economic management (in particular monetary and exchange rate policies and fiscal policy). Over half a decade, the declining cluster

[16] Data shortcomings limit the availability of indicators. For instance, in the past decade, Sudan has neither been included the Heritage Foundation's Index of Economic Freedom, nor in the World Economic Forum's Global Competitiveness Report. It has been included in the World Bank's Doing Business Indicators since 2010.

scores for structural policies and public sector management and institutions mainly reflect a worsening business, regulatory, and trade environment, quality of public administration, and transparency, accountability, and corruption in public services. Only the cluster score for social inclusion and equity policies saw an improvement, owing to better scores for social protection and labor as well as gender equality.

Figure III.16. Worldwide Governance Indicators

(2002–10, Index ranges from approximately -2.5=weak to 2.5=strong)[1]



Note: [1] The indicator value for 2001 is interpolated.

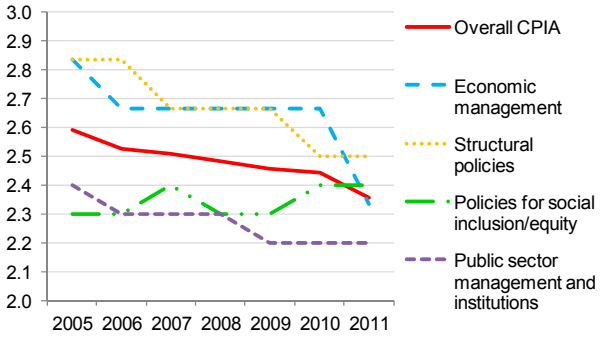
Sources: World Bank (2011); and IMF staff calculations.

Table III.4. CPIA Ratings
(Score ranging from 1=low to 6=high)

	2003	2008	2011
Sudan	2.49	2.48	2.36
Median			
Regional Peers	2.99	2.73	2.76
COMESA	3.25	3.23	3.21
LICs	3.35	3.34	3.40
Oil-Exporting LICs	2.97	3.19	3.00
Fragile LICs	2.97	2.74	2.90
Regional Peers			
Angola	2.12	2.73	2.69
CAR	2.30	2.50	2.76
Chad	3.22	2.53	2.43
Eritrea	2.99	2.34	2.16
Ethiopia	3.25	3.35	3.46
Nigeria	2.70	3.44	3.43
Yemen	3.75	3.19	2.98

Sources: World Bank (2012c); and IMF staff calculations.

Figure III.17. Decomposing Sudan's CPIA
(Score ranging from 1=low to 6=high)



Source: World Bank (2012d).

(iv) *Transparency International's Corruption Perception Index*. Over the last decade, also, Sudan's index of perceived public sector corruption has deteriorated significantly and more than its regional peers, making it seventh to worst in the ranking of 183 countries in 2011 (Table III.5). This particularly highlights the need for strengthening institutions, bureaucratic effectiveness, governance, and security.

Table III.5. Corruption Perceptions Index
(Rank and score ranging from 0= highest perception to 10=lowest perception)

	Rank			Score		
Year	2003	2007	2011	2003	2007	2011
Number of countries	133	180	183	133	180	183
Sudan	106	172	177	2.3	1.8	1.6
Median 1/						
Regional Peers	92	147	154	2.5	2.2	2.2
COMESA	92	111	116	2.5	2.8	2.8
LICs	106	123	132	2.3	2.6	2.6
Oil-Exporting LICs	113	139	154	2.2	2.4	2.2
Fragile LICs	113	150	154	2.2	2.1	2.2
Regional Peers						
Angola	124	147	168	1.8	2.2	2.0
CAR	n.a.	162	154	n.a.	2.0	2.2
Chad	n.a.	172	168	n.a.	1.8	2.0
Egypt	70	105	112	3.3	2.9	2.9
Equatoria Guinea	n.a.	168	172	n.a.	1.9	1.9
Eritrea	n.a.	111	134	n.a.	2.8	2.5
Ethiopia	92	138	120	2.5	2.4	2.7
Nigeria	132	147	143	1.4	2.2	2.4
Yemen	88	131	164	2.6	2.5	2.1

Sources: Transparency International (2011); and IMF staff calculations.

D. Policy Recommendations and Conclusions

15. Sudan's competitiveness and external stability could be at risk.

(i) Price indicators suggest that the recent reforms have helped, but were not sufficient to realign the real exchange rate with economic fundamentals. REER overvaluation pressures, multiple parallel exchange rates, and administrative restrictions on access to foreign exchange persist. Undoing them would help (i) restore competitiveness and current account sustainability; (ii) reduce dead-weight loss ensuing from the use of informal channels by encouraging financial inflows (incl. remittances) through official channels; (iii) foster the credibility of the exchange rate system and its resilience to adverse exogenous shocks by accumulating international reserves; and (iv) remove the adverse impact of uncertainty relating to the exchange rate and foreign exchange regime on investment and diversified economic growth.

(ii) *Non-price indicators show that Sudan lost ground relative to its own historical* performance *and its peers*. A challenging business environment impedes private sector development, hampering the competitiveness that would help the economy to expand and diversify away from natural resources.

16. Although recent reforms will help remove some distortions and ease some pressures, Sudan needs to sustain macroeconomic policy and structural reform efforts to restore Sudan's price and non-price competitiveness.

(i) To restore price competitiveness, adjusting the exchange rate policy is only a necessary but not a sufficient condition for a successful external adjustment.

- *Exchange rate policy*. After the recent step devaluation of the exchange rate, the authorities need to allow the exchange rate to move in line with market fundamentals and gradually phase out administrative restrictions. This will help to achieve convergence of a single unified official exchange rate to the curb market rate.

- Flanking complementary macroeconomic policies. To ensure that the recent nominal depreciation of the exchange rate translates into a sustained real depreciation, fiscal discipline and tight monetary policy are crucial. In particular, Sudan should:

  (a) reinforce efforts to stop monetizing the fiscal deficit, through continued fiscal consolidation. In the absence of international financial assistance, and in order to regain confidence in its economy and thus in its currency, Sudan must rigorously implement the recently adopted reform program. It also needs to sustain adequate reform efforts to manage the transition to an economy with reduced fiscal space and to put a halt to the monetary financing of the budget.

  (b) foster central bank independence and monetary policy. Freeing the CBOS from financing the budget and supporting the exchange rate would open room for an independent and consistent monetary policy primarily devoted to price stability.

(c) increase external financing. Sudan needs capital inflows—especially in the form of official assistance and highly concessional loans—to ease domestic financing pressures, reform its economy, and develop its infrastructure. To this end, it also needs to prudently manage its debt and establish broad support for debt relief under the Enhanced HIPC Initiative.

(d) promote growth, boost productivity, and diversify exports. Sudan must pursue prudent macroeconomic policies and structural reforms to improve the business climate: these reforms should be geared towards fostering growth, increasing productivity, rebuilding nontraditional exports (such as manufacturing and agriculture), and attracting FDI.

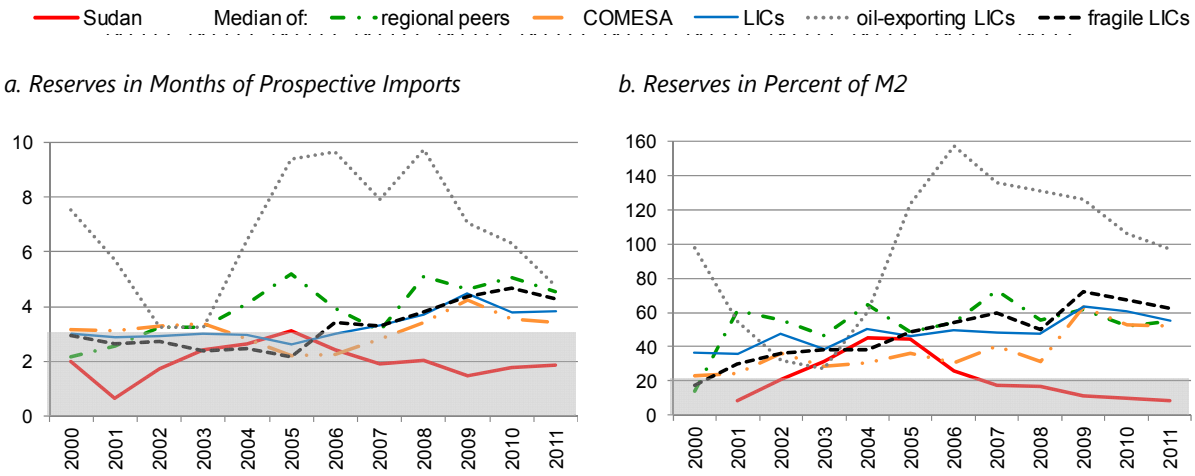
(ii) *To* restore *non-price competitiveness, Sudan needs to implement substantial structural reforms*. While improving the business environment and cross-border trading, accelerating financial sector development, diversifying the economy and investing in infrastructure to reduce production and distribution costs are crucial, improving the political and security environment and enhancing governance are equally important.

APPENDIX III. RESERVE ADEQUACY ASSESSMENT

1. Sudan's international official reserves have remained inadequately low –providing only a small buffer against external shocks that threaten to undermine domestic economic welfare and constraining CBOS' ability to support the official exchange rate.[1]

(i) Sudan's reserve levels fall short of the minimum level suggested by traditional rules of thumb and the levels of its peers. For most of the past decade, Sudan's reserve levels have fallen short of the threshold of three months of prospective imports (Appendix III, Figure 1.a). Moreover, the reserve levels have only temporarily risen above the 20 percent of M2 threshold in the mid-2000s and are since gradually approaching the 5 percent of M2 threshold (Appendix III, Figure 1.b). At the same time, Sudan also falls short of its peers' performance.

Appendix III. Figure 1. Common Rules of Thumb for Assessing Reserve Levels



Sources: WEO; IFS; and IMF staff estimates.

(ii) Sudan's reserves also fall short of the optimal level determined by a new methodology presented by Dabra-Norris et al. (2011) and IMF (2011b). Unlike the traditional rules of thumb, it accounts for the costs and benefits of holding reserves, whilst also adjusting for country characteristics and policy fundamentals:[2]

[1] See e.g. Jeanne and Ranciere (2006, 2008). There are also other motives for reserve accumulation, such as mercantilist motives discussed in Dooley et al. (2004).

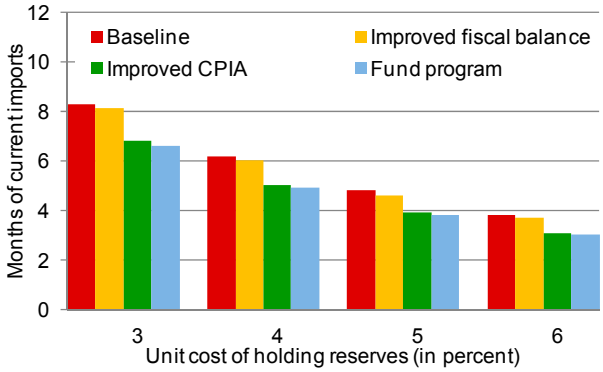
[2] The optimal level of reserves balances reserves' crisis prevention and mitigation benefits against their net financial cost. While a crisis is defined as a sharp drop in absorption, net financial costs are defined as foregone investment opportunities measured by the marginal product of capital.

- As summarized in the text table, the baseline analysis sets fundamentals (i.e. fiscal balance and CPIA) at their most recent realized levels (2011). It further uses the bottom 10th percentile of the country-specific distribution over the past 10 years (2002–11) for the shock variables (i.e., terms of trade, external demand, FDI to GDP ratio, and aid to GDP ratio). Moreover, the baseline analysis assumes a crisis probability that reflects 1½ crises per decade and factors in the absence of a Fund program.

Sudan - Baseline Analysis Inputs	
Government balance, percent of GDP	-1.33
CPIA	2.36
External demand growth, percent	5.82
Terms of trade growth, percent	-4.67
Change in FDI to GDP	-2.01
Change in aid to GDP	-0.71
Unconditional probability of a crisis	0.15

- Under these assumptions, the baseline scenario finds that the optimal level of reserves varies from almost 3.8 to 8.3 months of 2011 imports,[3] depending on the unit cost of holding reserves (Appendix III, Figure 2). However, if the fiscal position improved (e.g., to be in balance), the optimal level of reserves would be smaller, reflecting the fact that higher fiscal buffers will help fight a crisis. Also, if institutional capacity improved (and led to a higher CPIA of, for example, 3.25, the World Bank's threshold between weak and medium performer), the optimal level of reserves would also fall, reflecting the fact that stronger institutions would lower the probability of a crisis. For these reasons, also, a Fund program would reduce the optimal level of reserves to a range of 3 to 6.6 months of 2011 imports.

Appendix III. Figure 2. Optimal Level of Reserves



Source: IMF staff estimates.

2. Altogether, the assessment suggests that Sudan should significantly increase reserve holdings to be in the position to mitigate the impact of external shocks. The measures suggest that reserves should cover at least three months, but under the current baseline some four to eight months of imports (depending on the opportunity cost of capital) would be optimal. However, the model fails to account for Sudan's large infrastructure investment needs and the cost of its external debt. As these tend to further increase the opportunity costs of holding reserves, it would be appropriate for Sudan to target the lower middle of the suggested range of reserve coverage.

[3] Note that the model yields an import coverage based on imports of the last year of the observation period. That usually tends to be slightly higher than that based on prospective imports, but not for Sudan in 2012, mainly because of the secession-induced contraction of imports.

REFERENCES

Dabra-Norris, Era, Jun Il Kim, and Kazuko Shirono (2011), "Optimal Precautionary Reserves for Low-Income Countries: A Cost-Benefit Analysis," IMF Working Paper 11/249 (Washington: International Monetary Fund).

Di Bella, Gabriel, Mark Lewis, and Aurélie Martin (2007), "Assessing Competitiveness and Real Exchange Rate Misalignment in Low-Income Countries," IMF Working Paper 07/201 (Washington: International Monetary Fund).

Dooley, Michael P., David Folkerts-Landau, and Peter Garber (2004), "The Revised Bretton Woods System," *International Journal of Finance and Economics*, vol. 9, pp.307–313.

International Monetary Fund (2011a), "Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER)," available at http://www.imfareaer.org/Areaer/Pages/Home.aspx.

_____ (2011b), "Managing Volatility: A Vulnerability Exercise for Low-Income Countries," available at www.imf.org/external/np/pp/eng/2011/030911.pdf.

Jeanne, Olivier and Romain (2006), "The Optimal Level of International Reserves for Emerging Market Countries: Formulas and Applications," IMF Working Paper 06/229 (Washington: International Monetary Fund).

_____ (2008), "The Optimal Level of International Reserves for Emerging Market Economies: A New Formula and Some Applications," CEPR Discussion Papers No. 6723.

Lee, Jaewoo, Gian Maria Milesi-Ferretti, Jonathan Ostry, Alessandro Prati, and Luca Antonio Ricci (2008), "Exchange Rate Assessments: CGER Methodologies," IMF

Occasional Paper No. 261 (Washington: International Monetary Fund).

Transparency International (2011), "Corruption Perceptions Index," available at http://www.transparency.org/policy_research/surveys_indices/cpi.

World Bank (2012a), Harmonized List of Fragile Situations FY13, available at http://web.worldbank.org/WBSITE/EXTERNAL/PROJECTS/STRATEGIES/EXTLICUS/0,,menuPK:511784~pagePK:64171540~piPK:64171528~theSitePK:511778,00.html.

_____ (2012b), "Doing Business," available at http://doingbuisness.org.

_____ (2012c), "CPIA," available at http://data.worldbank.org/indicator/IQ.CPA.IRAI.XQ/countries.

_____ (2012d), "IDA Resource Allocation Index," available at http://web.worldbank.org/WBSITE/EXTERNAL/EXTABOUTUS/IDA/0,,contentMDK:21359477~menuPK:2626968~pagePK:51236175~piPK:437394~theSitePK:73154,00.html.

_____ (2011), "The Worldwide Governance Indicators, 2011 Update," available at www.govindicators.org.

IV. FISCAL DECENTRALIZATION: TRENDS, CHALLENGES AND PERSPECTIVES[1]

This chapter reviews the current state of intergovernmental fiscal arrangements in Sudan and presents a set of challenges and policy options to inform fiscal adjustment efforts and improve the overall approach to fiscal federalism.

A. Introduction

1. Sudan has undertaken fiscal decentralization reforms since 1995, devolving more expenditure functions and revenue sources to lower levels of government. Accordingly, total revenue in Sudan's northern states has increased substantially over the past decade and concurrently states have increased their dependency on transfers to meet their responsibilities for basic service delivery. Large increases in transfers to states have contributed to rapid growth in state spending and weakened incentives to raise state own revenue.

2. The decentralized provision of goods and services is intended to increase the efficiency of public services by better taking into account differing local preferences, and enhancing the accountability of subnational authorities. Fiscal decentralization is expected to improve interregional equity and regional economic development by addressing vertical imbalances between the center and subnational levels of government, and horizontal interstates imbalances due to differing own revenue potential and needs. In this respect, fiscal decentralization is expected to redistribute resources to match local demand and enhance public service delivery, with a view to improving subnational autonomy and extend access to public services across all Sudan's states.

3. The loss of oil revenues following the secession of South Sudan is causing a major fiscal adjustment which will inevitably impact the flow of federal transfers to state governments. Sudan lost more than half of its government revenues following the secession in July 2011. An inevitable fiscal adjustment is already taking place, the bulk of which has came from cuts in investment spending. However, transfer to states has increased by about 8 percent in 2012, breaking the constitutional ceiling of 30 percent of government total revenues and grants; more than 60 percent of transfers are allocated to wage and salaries, with excess resources relocated from the capital budget. The fiscal shock at the federal level will need to be transmitted to states as the fiscal tightening pressure intensifies and resources need to be rebalanced toward social service delivery and capital spending.

4. This chapter reviews the current state of intergovernmental fiscal arrangements and presents a set of challenges and policy options to inform fiscal adjustment efforts and improve the overall approach to fiscal federalism. Section II reviews the institutional

[1] Prepared by Valentina Flamini.

foundation of fiscal devolution. Section III looks at the degree of fiscal decentralization and recent trends. Section IV introduces the concept of vertical fiscal imbalance and relates it to fiscal outcomes. Section V studies the horizontal distribution of natural resources across states. Section VI looks into the link between fiscal decentralization and poverty reduction. Section VII analyzes budget managements at the state level. Section VIII highlights the main challenges and provides policy advice.

B. Institutional Background

5. The process of fiscal decentralization started in 1995 when the revenue-sharing agreements of the federal and state governments were declared. Since then Sudan has operated a federal system with three tiers: federal, state and local. The Interim National Constitution (INC) and Comprehensive Peace Agreement (CPA) set the principles of wealth sharing between the federal government, the government of South Sudan and lower levels of government to address regional disparities and trace the root causes of conflict. The Constitution grants governments of Northern States the right to legislate for raising revenue collection through a variety of local taxes and charges for services provided by the state. The federal government is assigned the power to collect customs revenues, business profit taxes, personal income taxes, and VAT and also accrues non-tax revenues, mainly from oil. This vision of fiscal decentralization led to substantial increases of transfers from the federal to the state levels with the aim of effectively delivering public service and broader development outcomes.

6. States have three distinct sources of revenues: (i) own revenues; (ii) shared revenues; and (iii) federal transfers. Own revenues are collected directly by the states through taxes, fees, and user charges, and the states have the highest degree of autonomy, including rate-setting authority. Shared revenues mainly consist of 43 percent of VAT collection, 10 percent of public enterprise profits and 2 percent of petroleum revenue determined on a derivation basis. Federal transfers from the budget through the National Revenue Fund (NRF) are determined by agreed formula, by existing establishment costs, or based on ad hoc considerations (Table IV.1). Local government revenues comprise taxes on property, local transportation, local livestock production (40 percent of which is transferred to the state governments), and other local taxes or duties, as well as transfers from the state governments of some profits from public enterprises.

7. Federal transfers include (i) current earmark transfers; (ii) block transfers; and (iii) development transfers. Current earmarked transfers are allocated to wages, operations, and social subsidy and are determined by existing establishment costs (Table IV.1). Block transfers are determined according to a formula based on weighting criteria including population size, minimum requirement for government responsibility, social development (health and education), and the states' ability to collect own revenues. The allocation of development transfers is based on alternative indicators such as the states' development neediness and absorptive capacity. However, difficulty in identifying and quantifying the underlying indicators implied significant variation in the implementation of development projects across states.

8. States' expenditure responsibilities are broadly set in the constitution, with the main outlays going for primary health care, basic education, and safe drinking water. The Financial Allocation and Monitoring Commission (FFAMC) is accorded a horizontal decision making and monitoring role with regard to the allocation of federal transfers in order to ensure

transparency and fairness. The allocation of funds among the different states is based on a set of criteria, which include (weight in brackets): budget performance and revenue potential (10); Population size (15); Natural resources and their exploitation (10); Human resources (15); Infrastructure (5); Education, including standards of pupil-to-teacher ratios (10); Health, including access and costs (10); Security (10); Average per capita income (5); Distance from the center and ports, including road quality (10). The High Council on Resources (HCR) allocates to the states their share of the VAT and public enterprise profits. The HCR designates the public enterprises or joint ventures whose profit is to be allocated to the states and determines each state's share.

Table IV.1. Sources of State Revenue

Revenue Type	Revenue Items	Collection/Allocation Criteria
Own Resources	State land and propertiy tax and loyalities; charges for state services; licenses; state personal income tax; levies on tourism; stamp duties; state projects and national parks; grants aid and foreign aid; excise duties; border trade charges or levies in acciordance with national legislation; other state taxes	Tax base and fiscal effort by individual state
Shared revenue	VAT Sharing 2 percent of petroleum revenues	Derivation
Central transfers	(i) Current earmarked transfers: Wages Operations Social Subsidy (ii)Block transfers (iii)Development transfers Local component Foreign component	Agreed formulas; existing establishment costs; or ad-hoc criteria

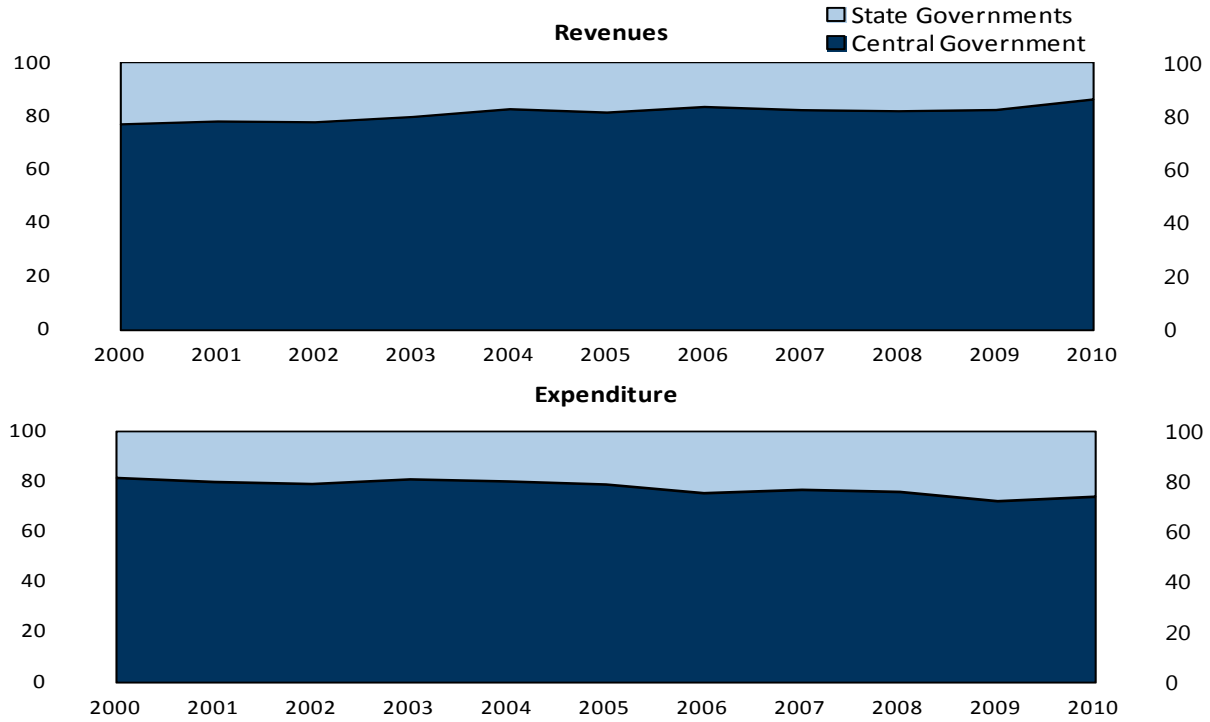
Sources: World Bank (2007).

C. Measuring Fiscal Decentralization

9. The Government of Sudan remains relatively centralized. As a measure of the degree of decentralization, this section uses the execution rate by the state governments of four general government fiscal indicators: total revenues, tax revenue, total expenditures, and compensation of employees. Figure IV.4 shows that in 2010 the decentralization of government finances was still very limited and the central government retained most of the execution power—ranging from 71 to 97 percent—on each of the four fiscal indicators.

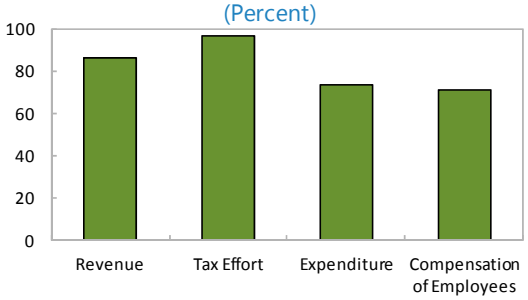
10. There has not been significant trend toward more decentralization since 2000. Figure IV.1 below shows the evolution of the fiscal aggregates since 2000. The ratios are relatively stable and there is no significant change between 2000 and 2010. Tax effort was the fiscal indicator with the lowest dispersion over time while expenditure and compensation of employees showed a visible if minor increase in decentralization. Revenue, on the other end evolved toward a more centralized structure over the same horizon.

Figure IV.1. Selected Fiscal Indicators by Government Level
(Percent)



11. Overall, spending decentralization has outpaced revenue decentralization, resulting in the emergence of vertical fiscal imbalance (VFI). VFI materializes when the devolution of spending responsibilities is not matched by the devolution of revenue responsibilities. In 2010 the Central Government of Sudan collected about 97 percent of the taxes of the General Governments and 86 percent of total revenues (Figure IV.2). On the other hand, the state governments executed a relatively high level of government employment, captured as compensation of employees, and expenditures. Here, the central Government accounted for only 71 and 74 percent respectively. In other words, the Central Government has maintained control on the revenue collection while assigning more expenditure responsibilities to state governments.

Figure IV.2: Central Government Execution for Selected Fiscal Indicators, 2010
(Percent)



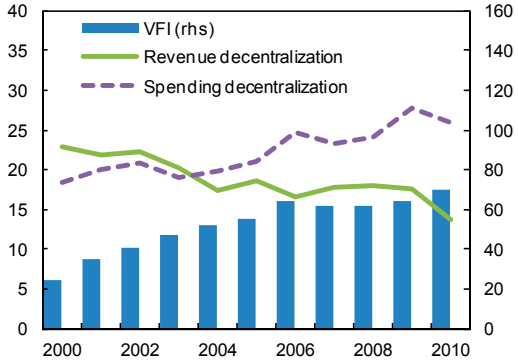
Sources: MOF; States Final Accounts Reports; and IMF staff calculations.

D. Vertical Fiscal Imbalances and Fiscal Performance in Sudan

12. The vertical fiscal imbalance, measured as the gap between own spending and own revenues at the state level, is very high in Sudan. While there is no consensus on a specific definition of VFI, this chapter follows Eyraud and Lusinyan (2011) and defines the vertical imbalance as the share of state own spending not financed through own revenues. This ratio was equal to 70 percent in 2010, meaning that only about one-third of states' expenditures are mobilized from states' own revenue sources. In contrast, international evidence shows that subnational governments in developing countries finance up to 70 percent of their spending from own sources.

13. The vertical fiscal imbalance has increased overtime due to a progressive devolution of spending responsibility coupled with increasingly centralized revenue functions. Between 2000 and 2010 the VFI increased from 25 to 70 percent indicating that the mismatch of spending and revenue decentralization has increased (Figure IV.3). This trend reflects increased expenditure decentralization on the back of declining revenue decentralization (Figure IV.1): while the share of state expenditure in general government expenditure has risen from 19 to 26 percent, the revenue share has fallen from 23 to 14 percent (Figure IV.3) likely due to the limited capacity of states to collect own revenues which, in turn, has increased states' reliance on central transfers.

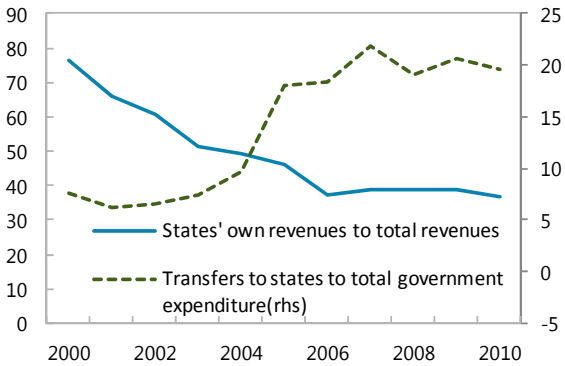
Figure IV.3: Fiscal Decentralization and VFI
(Percent)



Sources: MOF; States Final Accounts Reports; and IMF staff calculations.

14. The centralization of revenues has also increased the dependency of states on central transfers, which have increasingly weighted on the central government budget. Although the States' revenue collections increased, their structures have also shifted away from a majority of own revenues to a heavy dependence on federal transfers. According to the states' final account reports, the ratio of state own revenues to total revenues fell from 76.4 percent in 2000 to 38.9 percent in 2010. On the other hand, transfers to states (capital and current), which accounted for 7.7 percent of total central government expenditure in 2000, rose to 19.5 percent of total government disbursement in 2010 (Figure IV.4). About 57 percent of such increase occurred in 2005 with the signature of the CPA and the introduction of the INC. In fact, federal transfers have formed the backbone of resources available for Northern States since fiscal decentralization deepened in 2004/05.

Figure IV.4. Central Transfers to Northern States
(Percent)



Sources: MOF ; States' final account reports., and IMF staff calculations

15. The increasing role of transfers to meet the state's budgetary needs stems in part from their weak capacity to mobilize own resources, which contrasts with their expenditure obligations. The state own revenue mobilization showed relatively modest growth, especially over the CPA interim period; this draws attention to the need to substantially enhance their financial capacity to meet their expenditure responsibilities. The weak own revenue mobilization efforts can be attributed to several factors, including lack of infrastructure and human capacity, and depressed economic activity due to security problems.

16. The composition of subnational government revenues varies greatly across states, resulting in significant differences in vertical imbalances. The VFI averaged about 70 percent in 2000–10. However, VFIs present a large dispersion, varying from 34 percent in Khartoum and Red Sea, to 89 percent in Blue Nile. This heterogeneity is largely related to the dispersion of expenditure across states, the standard deviation of expenditure being 43 percent higher than the standard deviation of own revenues. This indicates that, while there are significant differences in the capacity of states to raise own revenue, the latter varying from 9 SDG per capita in North Darfur to 142 in Khartoum, the variation of expenditure across states is mostly determined by the amount of central transfers.

17. Large VFIs may relax fiscal discipline, and reducing imbalances can generate large fiscal gains. Although some level of discrepancy between subnational own revenues and spending is inevitable and may even be desirable, large gaps present risks. A common view in the normative literature is that a high reliance on intergovernmental transfers "softens" the budget constraint of local governments because the cost of spending is not adequately internalized (Rodden and others, 2003). However, the empirical literature shows conflicting results; some papers find that intergovernmental transfers improve fiscal performance by strengthening control over sub-national spending (De Mello, 2000). Empirical results in Eyraud and Lusinyan (2011) show that higher reliance on transfers or borrowing reduces the general government balance, other factors being equal, thus supporting the view that decreasing VFIs can potentially generate large fiscal gains. This negative effect seems to be more pronounced when regional disparities are large, as is the case in Sudan. The same authors also find that spending decentralization is not detrimental to fiscal performance when financed through additional sub-national own revenues.

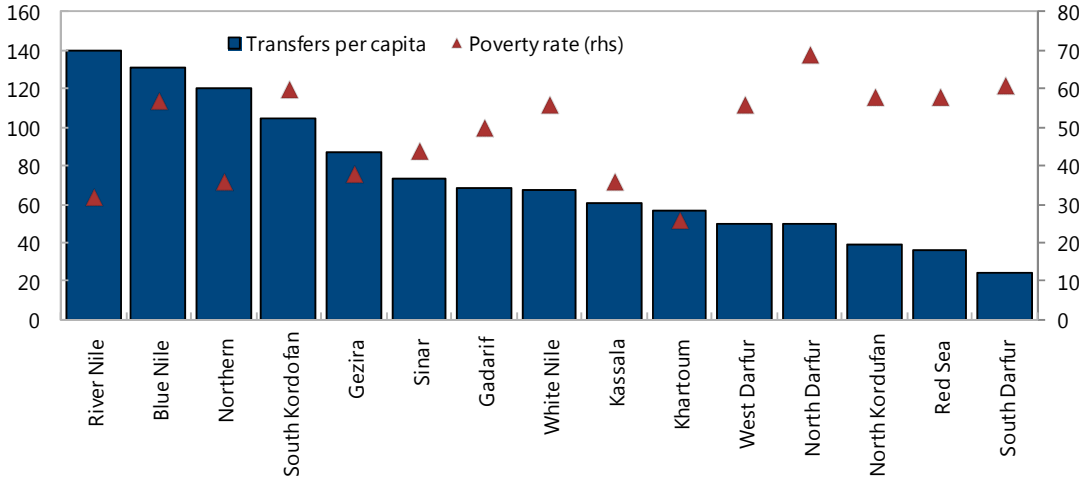
E. Horizontal Imbalances and Distribution of Transfers

18. The horizontal allocation of federal transfers is characterized by significant variation. Transfers per capita accrued to the top recipient state were on average six times higher than the bottom recipient in 2000-10. Blue Nile and Northern State are the highest recipients of federal transfers on a per capita basis, along with River Nile State. On the other hand, North Kordofan, Red Sea and South Darfur figure at the lower end of the ranking.

19. Overall, the current modalities for allocation of national resources are not entirely transparent and leave space for discretionary allocations. There is little clarity as to the current allocations for VAT and agriculture compensation is made on an annual derivation basis or based on historic collection and agriculture production level estimates. Current transfers are largely based on existing public-sector establishment costs or defined by a formula. While the former may distort incentives and limit the flexibility of state balances, the latter is based on

criteria difficult to reproduce based on readily accessible data, thus discouraging the identification and applicability of a fair and equitable system. In this respect, state reports suggest that some states might be under-resourced by virtue of their population size and the geographical distribution of poverty (Figure IV.5).

Figure IV. 5. Per Capita Central Transfers by State
(Average 2000-2010, SDG million)



Sources: States' Final Account Reports; and IMF staff calculations

F. Fiscal Decentralization and Poverty Reduction

20. Conventional wisdom postulates that decentralizing government finances should contribute to poverty reduction through efficiency gains and participatory governance. Decentralization might affect poverty directly through regional targeting of transfers, and indirectly through higher efficiency in local public service delivery and the related growth effect.

21. The regional targeting of transfers in Sudan, however, does not seem to have reduced interstate inequalities in income. Poverty is widespread in Sudan, and has a clear regional dimension. According to the National Budget Household Survey (NBHS) 2009 overall 46.9 percent of the population is below the poverty line. With a poverty ratio of 69 percent Northern Darfur is the poorest state, followed by Southern Darfur, Southern Kordofan, Red Sea and Northern Kordofan. On the other end, Khartoum, River Nile and Northern are the richest states with poverty ratios equal respectively to 26, 32 and 36 percent of the population, respectively. When the regional distribution of transfers is linked to poverty trends, with the exception of Khartoum and the Blue Nile, the poorest states are also those who receive fewer transfers.

22. The current system also made limited progress toward the improvement of social indicators and there is a case for refocusing expenditure to those states with higher poverty rates. Although increased central funding has been delivered to Northern states with a view to devolving expenditure responsibility for service delivery, budget data point to a generally low level of public spending devoted to the provision of basic services while most of the transfers are allocated to wage and salaries. Under the current system central and state governments share the responsibility for social spending: expenditure on primary health and education is intended to be gradually shifted to state governments while the central government is to

maintain a major role in secondary and tertiary education and health. Trends in education, health and access to safe water show that more than 10 years of devolution have not led to a visible improvement in social service delivery in Sudan.

G. Budget and Fiscal Management in Northern States

23. A successful fiscal decentralization depends on adequately autonomous and accountable sub-national governments with credible budgets and sound fiscal management practices. This section reviews the budgetary performance at the state level by looking at different dimensions of fiscal governance at the subnational level. Overall, the fiscal capacity of state governments is shackled by several weaknesses.

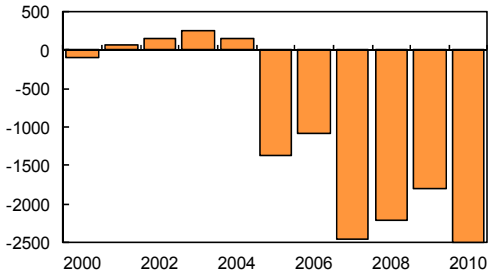
24. States' own revenue mobilization capacity is very low. The states' low collection capacity can be traced back to: i) lack of infrastructure, trained staff and adequate databases to manage collections; ii) disruption of revenue collection due to security problems especially in conflict areas such as Darfur, Blue Nile, South Kordofan; iii) depressed economic activity due to low productivity, lack of competitiveness, weak technology and insufficient diversification of markets for agricultural exports; and vi) a weak private sector and underdeveloped financial sectors at the state level. Moreover, local tax collection is undermined by the poor quality of data on state economic activity and tax base on which to found state taxes.

25. Budget credibility is poor due to recurrent spending rationing, and results in crowding out of developing spending. The lack of transparency regarding the allocation of central transfers and their erratic delivery, make these revenues difficult to predict and translate into weak capacity to estimate budget constraints. This causes misalignments between expenditure assignments and revenue allocations, resulting in revenue shortfall. The rationing of spending within the fiscal year is therefore a recurrent practice, and the mismatch is often absorbed by developing spending due to centrally imposed wage policies. This compromises the budget execution and results in crowding out of developing spending with the related consequences on service delivery.

26. Financial management is weak. There are no transparent guidelines clarifying roles and responsibilities among various government levels. Cash management procedures are weak and there is no systematic reporting. The lack of intergovernmental cooperation also hinders fiscal management by limiting the available functional information. For example, a comparison between central and state government accounts shows significant negative discrepancies between the consolidated transfers reported by states and the expenditure transfers to Northern States reported by the central government, the latter being considerably higher since 2005 (Figure IV. 6). Administrative drawbacks and limited human capacity compounded by institutional weaknesses impedes the authorities 'ability to plan, execute and monitor state budgets.

Figure IV.6: Discrepancy in Transfers Reported by States and Central Government

(SDG Million)



Sources: MOF; States Final Accounts Reports; and IMF staff calculations.

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H. Going Forward: Challenges and Policy Options

27. Important reforms are needed to improve basic social service delivery and budget management at the state level, and thereby establish the basis for a successful fiscal decentralization. The above analysis indicates that fiscal institutions are weak, social service delivery is inadequate and fiscal decentralization has so far been ineffective in reducing inequality and widespread poverty. Major areas for reform include i) building capacity at the sub-national level to meet administrative and institutional requirements; ii) improving the transparency and predictability of central transfers to the states; iii) strengthening fiscal institutions and budget credibility at the state level; iv) improving project management and social delivery to advance poverty reduction; v) refocusing central transfers toward the poorest states to reduce disparities across states; vi) improving the capacity of states to mobilize own revenues to reduce vertical imbalances and improve fiscal responsibility.

- ***Building capacity at the subnational level is necessary to allow states to fulfill their governance roles and responsibilities and support the institutional capacity to implement devolution.*** The pursuit of capacity building for decentralized governance requires a programmatic approach to improving the potential of state and local governments to manage economic and social development. Capacity building refers to both human capital and technological development and demands support for training activities as well as technological endowments; for both of these, development partners can play a significant role. Selected areas of need include revenue estimation, overall budget process, collection procedures, and development planning and execution.

- ***Greater transparency in the allocation of resources would promote legitimacy, enhance equitability, and improve the budget process.*** Options for reforming current practices include (i) a fully formula-based system based on proxies for state needs readily available and clearly identifiable, including fiscal capacity; or (ii) a combination of derivation basis and a formula for needs. Sharing revenues on a derivation basis potentially provides a more direct link between economic development in the states and transferred revenues, thus providing incentive for pro-growth policies, but might result in more disparities across states. In any instance, the allocation criteria should be clearly determined and enforced in a transparent way and the transfer of funds should occur without delay to allow states to predict their revenue flow and facilitate the budget process.

- ***Fiscal management practices need to be strengthened via improved revenue estimation and more credible state budgets.*** Making the transfers of funds from the central to the subnational level predictable and transparent would allow states firm estimates of intergovernmental transfers. Improved monitoring of basic economic activity in the states and a more reliable system of recording of all sources of tax and non-tax revenues would enable the estimation of own revenues. Reliable estimates of monthly cash flows would in turn enhance budgetary procedures and improve fiscal management.

Extending the GFSM 2001-compatible economic classification to all the states would enhance the quality of accounting at the state level and make it consistent with central government accounts.[2] This in turn would permit expanding the coverage of the fiscal accounts to the general government level thus internalizing the capacity of states to create debt and offset the country's fiscal adjustment efforts. A comprehensive and consistent database of government finance for documentation purposes could also improve fiscal reporting by making budget plans and execution publicly available. Finally, transparent guidelines clarifying revenues and expenditure assignments between states and localities would enhance revenue collection, streamline expenditure assignments and set the basis for sound wage and salary policies.

- ***Effective social service delivery requires higher capital spending on social projects and more efficient procedures for development planning and management***. Sudan expenditure in social spending, in relation to GDP, is low by regional standards. Increasing the share of public spending in health, education, and access to safe water, while shifting expenditure assignments to the states, would help improve the provision of social services. This however requires strengthening state-level development institutions and building capacity in project planning and management. Immediate needs include: identification of development priorities, project appraisal, execution capacities, and strategic management of funding.

- ***Refocusing federal transfers to the poorest states would enable more targeted development spending and reduce inequality across states.*** Aligning federal transfers with poverty trends would improve the distribution of capital investment to those areas where the delivery of basic services is inadequate. At the same time the devolution of social spending would better respond to local necessities. This in turn would decrease horizontal inequality and ignite economic growth.

- ***Boosting state own revenue mobilization capacity would reduce vertical imbalances and lessen the need for central transfers, thus minimizing the burden on the central budget.*** Higher revenue collection at the state level will lessen the dependency of states on transfers and assist the necessary fiscal consolidation at the central level. By internalizing budgetary expenditures, moreover, the reduction of vertical imbalances would improve budget efficiency and fiscal responsibility, thus improving financial performance at the state level.

28. There may be unique opportunities to combine efforts toward fiscal consolidation and decentralization as sound state governance stands as a prerequisite to the necessary fiscal adjustment. The need to reform the design and implementation of intergovernmental finance goes hand in hand with the central government consolidation efforts. A smooth transition toward a more sustainable fiscal stance requires good governance at the state level to

[2] As of March 2010 good progresses had been done to extend the GFSM 2001 compatible budget classification to nine northern states.

be durable as cutting central transfers has as a prerequisite enhanced revenue mobilization capacity and higher expenditure responsibility at the state level. Ultimately, effective fiscal decentralization can constitute a catalyst to economic prosperity and sustainable peace.

REFERENCES

De Mello, L., 2000. "Fiscal Decentralization and Intergovernmental Fiscal Relations: A Cross-Country Analysis," *World Development*, Vol. 28, No. 2, pp. 365–80.

Eyraud, L., and L. Lusinyan, 2011, "Decentralizing Spending More than Revenue: Does It Hurt Fiscal performance?" IMF Working Paper No. 226 (Washington: International Monetary Fund).

Rodden, J., G. S. Eskeland, and J. Litvack, 2003, "Fiscal Decentralization and the Challenges of Hard Budget Constraint," (Cambridge, MA: The MIT Press).

World Bank, 2007, "Sudan Public Expenditure Review," Report No. 41840-SD (Washington, DC).

World Bank, 2011, "From Spending More to Spending Smart – Case Study of the Health Sector," PETS for Northern Sudan (Washington, DC).

World Bank, 2011, "A Poverty Profile for the Northern States of Sudan," (Washington, DC).

V. GROWTH AND EMPLOYMENT IN SUDAN[1]

Over the past three decades, Sudan's growth performance improved gradually, but could not provide enough jobs for a rapidly growing labor force, especially for youth and women. A number of factors may help understand the weak link between growth and job creation, including a heavy reliance on the oil sector, underdeveloped private sector, and a mismatch between education and skill levels among the unemployed and labor market demand. Looking ahead, an effective strategy would need to aim at fostering productivity gains and higher private sector investment as the basis for growth and employment.

A. Introduction

1. During the past three decades, Sudan's growth performance improved gradually but could not provide enough jobs for a rapidly growing labor force. Notwithstanding a history of relatively high inflation, official estimates show that real GDP increased since the 1980s. With a rapidly growing population, the average real per capita income remained low by regional standards. Growth performance could not keep pace with a growing labor force, leading to persistent unemployment of about 20 percent, particularly affecting youth and women, notwithstanding significant employment in the informal sector (Box V.1).[2]

[1] Prepared by Jemma Dridi.

[2] Caution must be exercised when interpreting the findings of this chapter in view of the serious data limitations. Concerning GDP, while some improvements have been made to the estimates, data from national accounts data do not meet international standards in terms of quality, frequency, and dissemination practices. Furthermore, the impact of the informal sector on employment or GDP remains unknown, although this sector is deemed to be growing in importance. With regard to labor market data, only public administration sector employment and wages are available. Employment and wage data for public enterprises and the formal private sector are not available.

Box V. 1. Why Is Youth Unemployment High in Sudan 1/

The magnitude and persistence of youth unemployment are a major concern to the Sudanese authorities. Both supply and demand as well as institutional factors impact youth participation and unemployment rates in Sudan.

Supply factors include:

(i) Sudan's high population growth rate, which has resulted in a relatively young population and a high proportion of youth in the working-age group at a time when fewer jobs are being created.

(ii) Greater geographic mobility of youth than other cohorts. The high rate of youth urbanization (about 41 percent, against 31 percent for adults) is partly due to labor migration in search of better livelihood in cities and partly due to population displacement caused by past conflicts in the country.

(iii) The return, after the signature of the 2005 Comprehensive Peace Agreement (CPA), of ex-combatants, many of whom were below 30 years of age.

(iv) The low level of initial schooling and lack of matching mechanisms that smooth the school-to-work transition. High school graduates often lack of basic knowledge and skills for gainful employment, which diminishes the prospects for their participation in the labor force.

Demand factors include:

(i) Strong oil-driven growth in Sudan over the past decade has been accompanied by growing unemployment due to limited investment in the non-oil sector. The surge in aggregate demand following the oil boom was largely met through increased imports with limited spillovers to the rest of the economy. Agriculture, which provided employment for an estimated 45 percent of youth in 2011, has become less competitive and agricultural exports declined significantly owing to the overvalued exchange rate, reducing incentives especially for young farmers.

(ii) Weak demand for labor in the formal sector. In the absence of unemployment insurance and declining jobs in the formal sector, many of the unemployed end up in the informal sector where productivity and wages are very low.

(iii) The unemployed youth are disadvantaged due to their relative inexperience and lack of relevant skills, leading some employers to resort to foreign workers who are efficient and have the needed skills.

Youth unemployment is also driven by *other factors* including lack of employment information, career orientation, and ineffective labor market institutions. Job opportunities are not frequently advertised through the labor market, and hiring, often done through the labor market and the informal sector, relies completely on family connections and personal networks for recruitment.

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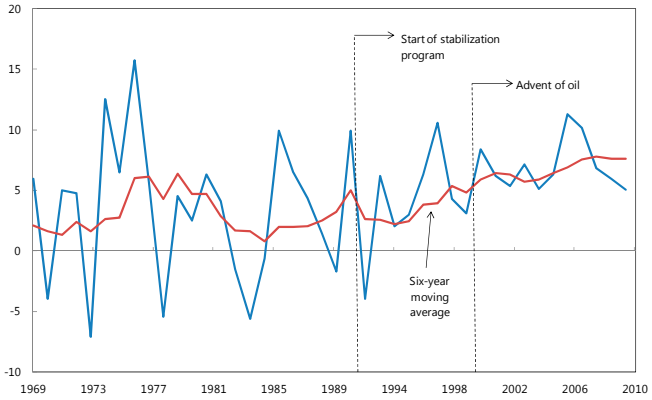
1/ See, for example, UNDP (2012), and Sudan Central Bureau of Statistics (2010).

B. Growth Performance

2. Macroeconomic developments had been volatile until the early 1990s and depended mainly on agriculture (Figure V.1). Real GDP growth alternated from a maximum of about 17 percent (1976) to a minimum of -6.5 percent (1985). The inflation rate had been on an upward trend, reaching about 133 percent in 1996, mainly due to the monetization of large fiscal deficits (figure V.2). Furthermore, already in the 1970s large trade imbalances started to build up as the imports of consumer- (mainly food), intermediate- (petroleum, chemicals), and capital goods (machinery and transport equipment) largely exceeded the exports of agricultural products. Even though remittances and foreign aid could help to narrow the financing gap, the remaining amount of capital had to be raised in the form of foreign medium- and long-term loans. These chronic deficits resulted in a rapid accumulation of debt arrears, which represent over 80 percent of total debt stock.

V.1. Real GDP Growth 1969–2010

(In percent)

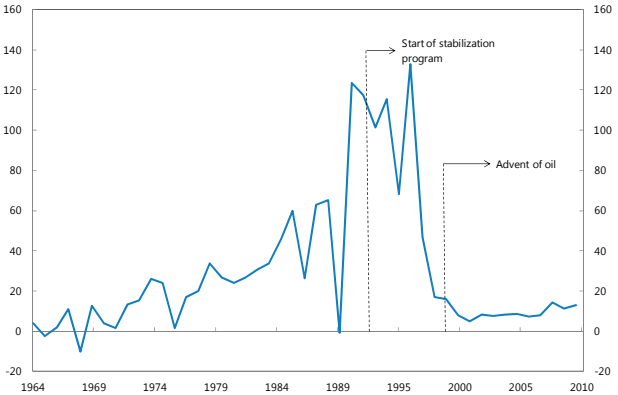


Sources: Sudanese authorities; and staff calculations.

3. In response to the deteriorating economic situation, the authorities issued a three-year National Salvation Program in June 1990. The program aimed to reduce the fiscal deficit, increase the role of the private sector, and privatize public enterprises. It also provided for a removal of controls on prices, profits, and exports. Poor implementation of reforms and continued expenditure pressures resulted in a growing monetization of the fiscal deficit, depreciating domestic currency and raising inflation. With the re-engagement of the IMF in the context of staff monitored programs (SMPs), starting in 1997, the macroeconomic outlook improved significantly and a stabilization process set in. Although agriculture was still the backbone of the Sudanese economy with a share of about 45 percent of GDP in 1999 and over 70 percent of the workforce, the focus had somewhat shifted away to the oil sector at the end of the millennium.

V.2. CPI Inflation, 1964–2010

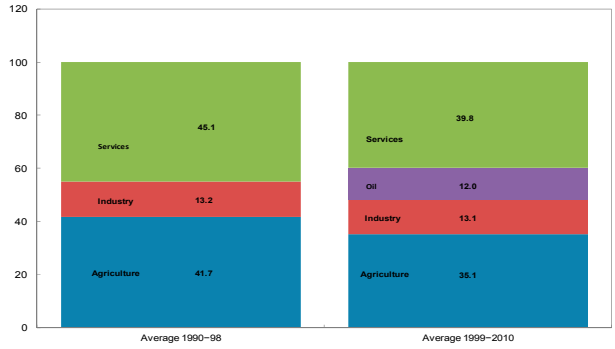
(In percent)



4. The advent of oil in 1999 has led to a shift in the composition of GDP. The increasing share of oil in GDP almost doubled the contribution of the industrial sector to GDP, from 13 percent in 1990–98 to about 25 percent for the period 1999–2010 (Figure V.3). At the same time, the share of agriculture declined from about 42 percent in 1990–98 to about 35 percent for the period 1999–2010. While the direct contribution of oil to GDP was limited, oil resulted in induced growth mostly in construction, trade, hotels and restaurants.

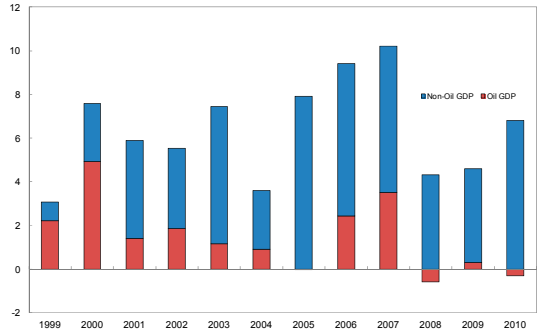
V.3. Sector Contribution to GDP

Share in Total GDP (In percent)



Sources: Sudanese authorities; and staff calculations.

Contribution to Overall Growth, 1999-2010 (In percent)

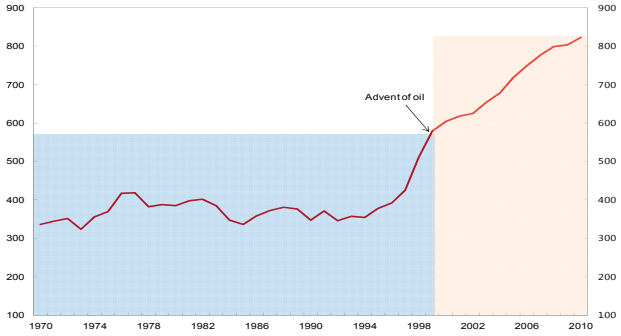


Sources: Sudanese authorities; and staff estimates.

5. Oil has also been contributing notably to sustained economic growth. The real growth rate picked up at about 3 percent and remained above 5 percent until 2009 (Figure V.3). On average this yielded a growth rate of about 7 percent per year during 1999–2009 compared to 3 percent per year during 1980–98. The 2008 global financial crisis hit Sudan hard mainly through falling oil revenues, declining FDI and reduced remittances inflows. Real GDP growth fell to 4.5 percent in 2009 and an estimated 5 percent in 2010. While the GDP per capita only slightly increased until 1999, it improved significantly since then from about US$334 in 1999 to an estimated US$533 in 2010 (Figure V.4).

V.4. Non-Oil GDP Per Capita 1970–2010

(In Constant 2000 U.S. Dollars)



Sources: Sudanese authorities; and staff calculations.

C. Main Sources of Growth: A Growth Accounting Exercise

6. Over the past two decades, the rate of gross investment (gross capital formation relative to GDP) hovered around 20 percent despite negligible FDI inflows until the mid-1990s. The investment effort has been an important source of growth, as evidenced by the high contribution of capital to GDP growth (Table V.1). However, during this period, despite the strong capital accumulation effort, relatively modest investment efficiency occurred in Sudan, as evidenced by the decline in capital productivity.[1] One explanation for this could be that a significant component of investment in Sudan after the advent of oil in 1999 was directed to public investment and infrastructure. Normally such investments do not yield quick returns.

7. Since the mid 1990s, Sudan made notable progress in education and the quality of human capital (Figure V.5). However, these achievements were not fully translated into commensurate labor productivity gains. As shown in Table V.1, labor productivity increased slightly from 3.2 percent in the 1990s to about 3.6 percent in the last decade.

Table V.1. Determinants of Growth, 1980–2011

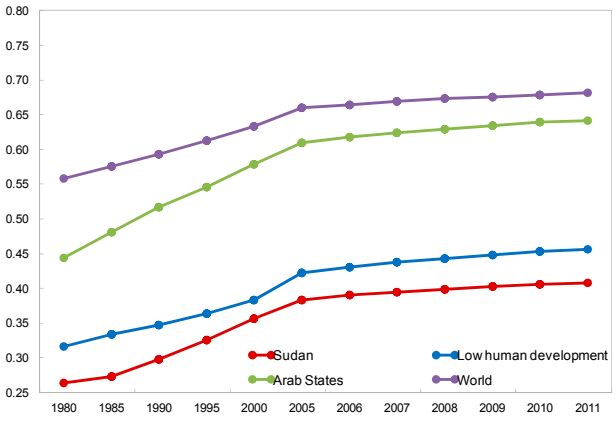
	1980–1991	1980s	1992–98	1990s	1999–2011	2000s
Growth rates (in percent)						
GDP	2.89	2.22	8.26	8.94	6.63	6.43
Labor	6.08	6.04	4.60	5.61	2.84	2.76
Capital	2.63	2.82	2.69	3.45	10.71	10.16
TFP	-1.84	-2.57	4.40	4.17	0.73	0.78
Contribution to GDP growth (in percentage points)						
Labor	3.71	3.68	2.81	3.42	1.73	1.68
Capital	1.03	1.10	1.05	1.35	4.18	3.96
TFP	-1.84	-2.57	4.40	4.17	0.73	0.78
Productivity growth rates (in percent)						
Labor productivity 1/	-3.01	-3.60	3.50	3.15	3.69	3.57
Capital productivity 2/	0.26	-0.59	5.42	5.30	-3.68	-3.39
Capital per worker	-2.76	-3.03	-1.83	-2.05	7.65	7.20

Source: Sudanese authorities; and IMF staff estimates.
1/ Defined as output per employee.
2/ Defined as output per unit of utilized capital.

[1] Capital productivity is defined as the output per unit of utilized capital.

Figure V.5. Human Development Indicators in Sudan

Trends 1980–2011



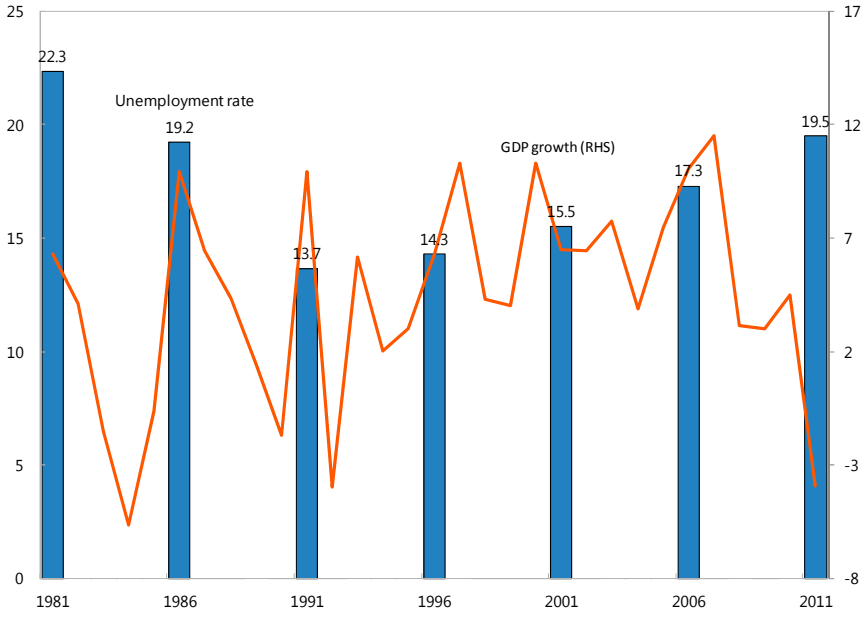
Source: UNDP, 2011.

D. The Growth-Employment Nexus

8. Unemployment in Sudan has remained high and persisted at about 20 percent despite respectable growth rates (5–6 percent). A number of factors may help understand the disconnect between growth and employment (Figure V.6).

Figure V.6. Unemployment and Growth, 1981–2011

(In percent)



Sources: Authorities; and staff estimates.

- **Sudan's demographic structure:** High population growth rates are exerting enormous pressures on labor markets as new generations prepare to enter the workforce. Sudan's population stood at about 32 million in 2011, growing at about 2.8 percent a year in the past decade. This has generated a labor force estimated at 12 millions in 2011, a rate of about 3 percent a year during the past decade. Youths (ages between of 15 and 24) account for about 20 percent of the total population, participate about 30 percent in the labor force, and about 42 percent of them are unemployment (Text table and Figure V.7).

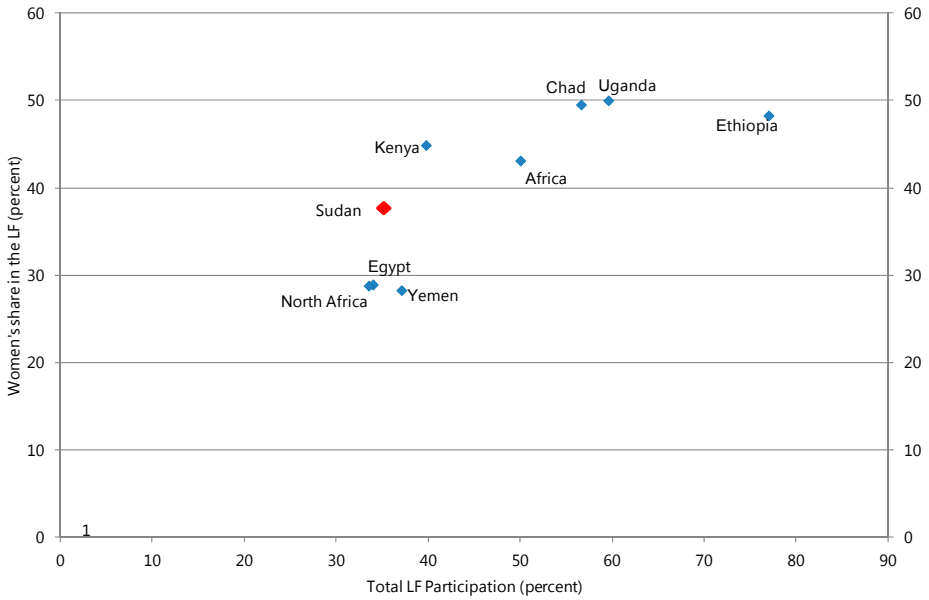
Labor force participation rate per age groups (in percent)

	Total	Men	Women
65+	38	56	14
55-64	59	86	21
45-54	64	96	28
35-44	61	96	29
25-34	54	87	24
15-24	30	44	17

Source: CBStat, 2009

- **Limited sources of growth:** The performance of the agricultural sector, which accounts for over 35 percent of GDP and continuously over 70 percent of job creation, is subject to weather fluctuations. The oil sector contributed around 13 percent of GDP over the past decade, but is capital-intensive and generates relatively few jobs. Also, oil price fluctuations have had a significant effect on growth rates in the past. Furthermore, the loss of three quarters of oil production as a result of South Sudan's secession is undermining growth prospects, as reflected in a weaker investment climate.

Figure V.7. Labor Force: Size, Gender, Composition and Participation Rate, 2011



Source: International Labor Organization, LABORSTA .

- **Oversized public sector:** As in some MENA countries, government institutions in Sudan are overstaffed and government employees enjoy more benefits than in the private sector. In the long run, high levels of government employment limit economic growth by trapping workers in less productive public-sector jobs and deterring investment in the private sector.

- **Underdeveloped private sector:** Sudan has undergone a wave of privatization over the past two decades. But many key economic sectors remain under direct or indirect state control. The private sector is still subject to numerous constraints and distortions, and is not growing fast enough to absorb the large number of first-time job seekers.

- **Labor market inefficiencies:** Weak and inefficient regulations and institutional settings for organizing the labor market, and its rigidity and lack of dynamism limit employers' appetite to hire. These include unsustainable practices such as lifetime job security programs in the public sector; large regional imbalances between labor supply and demand; a serious mismatch between the specialization of young university graduates on the one hand and the skills needed by labor markets on the other; and a serious information deficit that limits awareness of emerging job opportunities across the labor force.

- **The North-South conflict**: The civil war not only led to displacement of many workers and job losses, but also meant large spending on defense and security issues rather than prioritizing investment in social development and the creation of more employment opportunities; this has in turn contributed to increase in unemployment problems in Sudan.

E. Medium-Term Unemployment Scenarios

9. This section presents stylized scenarios on the evolution of unemployment over the medium term (2012–17) using ILO (2011) projections of the economically active population based on demographic projections[2] and alternative measures of employment-GDP elasticities.[3] The main advantage of using this methodology is that it takes into consideration demographic trends that affect the medium-term evolution of the economically active population. However, this approach ignores the impact of changes in economic activity on workers' decisions to enter or exit the labor force.[4]

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[2] The labor force series for the period 2012–17 were derived by applying the changes projected by the ILO to the 2011 estimates provided by the authorities.

[3] An alternative method would be to project the evolution of unemployment over the medium term using the estimated elasticities between the unemployment rate and GDP. However, this methodology does not take into account demographic trends which can affect participation rates over the medium term.

[4] The analysis uses the 2012 IMF "Template for Analyzing and Projecting Labor market Indicators".

10. The results of the analyses suggest that in the absence of reforms aimed at improving the responsiveness of labor market conditions to changes in economic activity, unemployment is likely to remain high over the medium term.

11. The employment-output elasticity was estimated using time series regressions of the following equation:

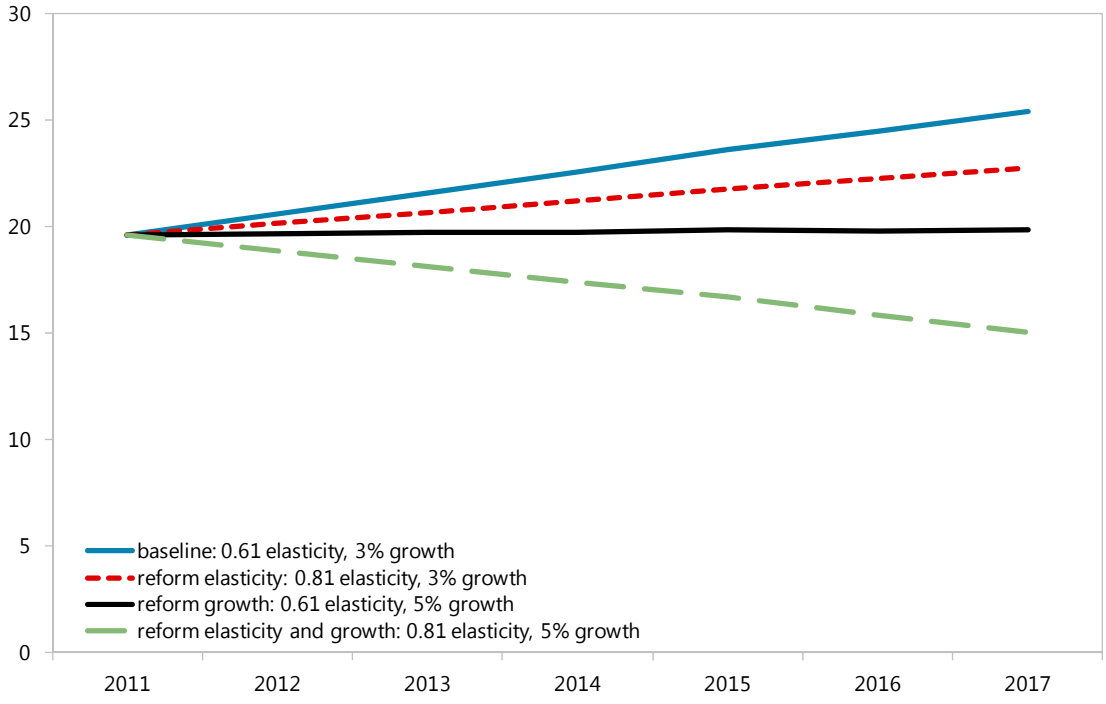
$$Ln\ (E_t) = \alpha + \rho_1 * \ Ln(E_{t-1}) + \beta * Ln(Y_t) + \omega_t\ ,$$

E_t is the level of employment at time *t*, Y_t the level of non-oil GDP at time *t*, α a constant, and ω_t an error term. Official data sources and staff estimates were used to derive employment and GDP series for the period 1980−2011.

12. The baseline scenario shows that using an estimated employment-GDP elasticity of 0.6, and assuming an average growth rate for non-oil GDP of 3 percent (the projected average growth rate for 2012−17) would lead to an increase in unemployment of about 6 percentage points over the medium term: from 19.6 percent estimated for 2011 to about 25 percent in 2017. A more favorable growth performance of the non-oil sector (of about 5 percent) would keep unemployment in 2017 at the level estimated for 2011 (19.6) percent by 2017 (Figure V.8).

13. The reform scenario shows that assuming employment-GDP elasticity of 0.8 and an average growth rate for non-oil GDP of 3 percent, the implementation of labor market reforms aimed at improving the responsiveness of unemployment to economic activity (higher employment-GDP elasticity), would lead to an increase in unemployment of 3 percentage points, which is still better than the baseline scenario with 0.6 elasticity), from 19.6 estimated for 2011 to about 22.5 percent in 2017. This scenario also shows that a more favorable growth performance of the non-oil sector (of about 5 percent), in addition to reforms that increase the elasticity to 0.8, would reduce the unemployment rate to about 15 percent by 2017 (Figure V.8).

Figure V.8. Unemployment Rate Projections
(In percent)



Sources: Sudanese authorities; and staff estimates and projections.

F. Conclusion and Policy Recommendations

14. Sudan's growth performance improved gradually in the past two decades but could not provide enough jobs for a rapidly growing labor force, especially for youth and women. A number of factors may help understand the weak link between growth and job creation. These include a heavy reliance on the oil sector, with insufficient investment devoted to the rest of the economy, an underdeveloped private sector, and a mismatch between education and skill levels among the unemployed and labor market demand.

15. Formulating detailed policy recommendations for a comprehensive growth and labor market strategy in Sudan is beyond the scope of this chapter. In broad terms, an effective strategy would need to aim at fostering productivity gains and higher private-sector investment as the basis for growth and employment, and would therefore need to place emphasis on several factors, including: (i) accelerating the implementation of the reform program that would improve the business environment and allow the private sector to expand; (ii) removing existing rigidities in the labor market; (iii) strengthening and restructuring the educational and vocational training systems, with the objective of alleviating mismatches between workers' skill and education levels and job openings; and (iv) reforming labor market regulations so as to increase mobility and flexibility.

REFERENCES

Sudan Central Bureau of Statistics, (2010), "The Fifth Sudan Population and Housing Census."

United Nations Development Program, (2011), *Human Development Report*.

United Nations Country Team in the Republic of Sudan (2012), Country Analysis, Draft report, January.

Sudan Ministry of Finance and National Economy, (2011), "The Sudan Economy in Figures," different series (1995–2011).