

INTERNATIONAL DEVELOPMENT ASSOCIATION AND
INTERNATIONAL MONETARY FUND

CHAD

**Joint Fund-Bank Debt Sustainability Analysis under the Debt Sustainability
Framework for Low-Income Countries**

Prepared by the staffs of the International Development Association and
the International Monetary Fund

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June 1, 2010

Chad's risk of debt distress remains moderate provided that the authorities adjust the fiscal stance to the decline in oil production. If current policies were continued, the resulting debt path would increase steeply, leading to an unmanageable debt and debt-service burden. Compared to last year's Debt Sustainability Analysis (DSA), Chad's debt vulnerabilities have increased because the authorities have used central bank financing and contracted two large nonconcessional external loans.¹

I. BACKGROUND

A. Recent Developments in Public External Debt

1. **Chad's external debt burden diminished considerably over the past decade thanks to strong oil sector-driven growth and limited borrowing.** The nominal stock of external debt declined from 63 percent of GDP in 2001 to 24 percent in 2009 (Text Table 1, Tables 1a and 1b). All of Chad's external debt is public, and the bulk is owed to multilateral creditors, mainly the International Development Association (IDA) and the African Development Bank (AfDB). This includes debts incurred or guaranteed by the central government. The analysis is conducted on a gross basis. Nominal debt levels trended downward as Chad reduced its use of external loans, amortized debt as scheduled, and prepaid IBRD and IDA loans associated with the financing of the Chad-Cameroon Pipeline Project in September 2008.

¹ The DSA has been produced jointly by World Bank and Fund staffs in consultation with the staff of the African Development Bank.

	2001	2002	2003	2004	2005	2006	2007	2008	2009
Total	794.7	786.6	736.9	797.2	898.9	896.2	794.0	782.3	764.6
(percent of GDP)	63.4	56.8	46.3	34.2	29.0	27.2	23.6	20.9	23.7
Multilateral	678.1	687.7	652.5	715.3	810.2	805.5	718.6	706.6	688.6
IMF	65.3	67.3	57.0	47.7	47.5	37.4	25.4	19.0	12.9
World Bank/IDA	380.6	398.3	394.0	444.5	507.8	486.1	453.4	422.0	408.0
African Development Fund/Bank	182.8	169.8	159.9	168.5	179.8	205.8	173.7	182.4	187.2
EIB	3.9	7.9	7.3	13.0	13.0	12.4	9.9	9.8	8.1
Others	45.5	44.4	34.2	41.6	62.0	63.8	56.2	73.4	72.4
Bilateral	116.2	98.6	84.1	81.9	88.8	90.7	75.4	75.7	76.0
Paris Club official debt	30.2	25.8	24.0	25.2	24.3	23.2	23.6	19.2	17.9
Non-Paris Club official debt	86.1	72.7	60.1	56.7	64.4	67.5	51.8	56.5	58.0
<i>of which:</i> China, People's Republic	28.6	25.4	22.0	13.6	15.4	13.9	-	3.5	10.3
Taiwan, Province of China	29.2	25.0	20.8	19.2	20.8	16.2	15.0	15.1	13.8
Saudi Arabia	10.4	9.3	6.2	15.2	16.9	14.4	11.4	7.8	6.6
Kuwait	15.3	12.9	11.0	8.6	11.2	11.7	10.8	10.2	8.4
Other creditors	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0

Source: Chadian authorities and selected creditors.

2. **Notwithstanding a sharp deterioration of the fiscal position in 2009, external public debt decreased further in nominal terms.** The international economic and financial crisis triggered a steep drop in oil revenue and a large increase in the fiscal deficit (to about 21 percent of non-oil GDP). This sharp deterioration of Chad's fiscal position was financed by the depletion of government savings accumulated at the central bank and by the use of central bank statutory advances.

B. Recent Developments in Public Domestic Debt

3. **Chad has a small stock of public domestic debt resulting from the accumulation of past arrears and the recent use of central bank statutory advances.** Chad's domestic debt is estimated at about CFA 250 billion (7.7 percent of GDP) at end-2009 (Text Table 2). The public domestic debt includes central bank statutory advances (*avances statutaires*); treasury arrears (*arriérés comptables*) from previous budget years; rescheduled debt (*dettes conventionnées*); legal payment obligations (*engagements juridiques*); and one small public borrowing. The authorities view settlement of all verified arrears and debts as an opportunity to improve the public sector's credit standing and increase private sector confidence.

Text Table 2. Chad: Public Domestic Debt Stock at Year-End, 2005-09 (billions of CFA francs)					
	2005	2006	2007	2008	2009
Total	142.1	79.2	79.1	100.6	249.7
(Percent of GDP)	4.6	2.4	2.4	2.7	7.7
Central Bank Statutory Advances	38.3	-	17.8	21.7	141.7
Rescheduled debts	31.1	39.5	16.2	25.4	52.2
Treasury arrears	34.1	24.8	26.1	41.1	25.7
Legal commitments	38.6	14.0	18.1	11.5	29.3
Savings Bonds	-	0.9	0.9	0.9	0.9

Source: Chadian authorities.

C. Status of Implementation of Debt Relief Initiatives

4. **Poor macroeconomic policy performance and limited progress towards other triggers have prevented Chad from reaching the completion point under the Enhanced Heavily Indebted Poor Country (HIPC) Initiative.** Chad's inability to meet agreed fiscal targets and to satisfactorily implement a program under the IMF's Poverty Reduction and Growth Facility (PRGF) has been the principal obstacle. The 2005 PRGF expired in 2008 without any reviews being concluded. Subsequent efforts to achieve fiscal stability with the support of Staff-Monitored Programs (SMP) were also derailed by fiscal slippages. Progress towards other completion point triggers² has either been slow, or early gains have been followed by subsequent deterioration.³

5. **Meeting the conditions for debt relief under the Enhanced HIPC Initiative and the Multilateral Debt Relief Initiative (MDRI) would cut external debt in half.** MDRI relief would cover the full stock of debt owed to three multilateral creditors (IDA, IMF, and the African Development Fund (AfDF)) that remains after Enhanced HIPC relief on disbursements before end-2004 in the case of IMF and AfDF, and before end-2003 in the case of IDA. In nominal terms, this could total over \$1 billion and would imply a reduction in debt service of about \$40 million per year.

D. Debt Burden Thresholds under the Debt Sustainability Framework

6. **Chad is a weak policy performer for the purpose of debt burden thresholds under the Debt Sustainability Framework (DSF).** Chad's rating on the World Bank's

² For a description of completion point triggers, see [Chad, Decision Point Document for the Enhanced Heavily Indebted Poor Countries \(HIPC\) Initiative, May 4, 2001](#), pp. 29-31.

³ [Heavily Indebted Poor Countries \(HIPC\) Initiative and Multilateral Debt Relief Initiative \(MDRI\) - Status of Implementation 2009](#), Table 2B, p.32.

Country Policy and Institutional Assessment (CPIA) is low (2.62 on average for 2006-08 on a scale from 1 to 6) and declining (Chad's CPIA declined from 2.88 in 2005 to 2.53 in 2008).⁴ The corresponding thresholds are shown in Text Table 3.

Text Table 3. External Public Debt Burden Thresholds for "Weak Policy Performers" under the Debt Sustainability Framework	
Present value of external debt in percent of:	
GDP	30
Exports	100
Revenue	200
External debt service in percent of:	
Exports	15
Revenue	25

II. BASELINE SCENARIO UNDERLYING THE DEBT SUSTAINABILITY ANALYSIS

7. **The central feature of Chad's medium- and long-term macroeconomic outlook is the steady decline of annual oil production foreseen over the next twenty years.**

Production at the Doba oil field started in 2003, reached its peak of 61 million barrels in 2004, with annual output set to decline steadily to a negligible level beyond 2030. Long-term oil export projections are based on this gradual depletion of the Doba field. Due to its quality, Chad's oil sells at a discount, usually of \$10-15 per barrel relative to the international reference price, reflecting a quality discount and transport cost. For the medium term (to 2015) the Chadian price is assumed to grow at the same rate as assumed in the IMF's World Economic Outlook (WEO); for the longer term (2015 to 2030), at the growth rate of the International Energy Agency's (IEA) reference price. Work has started to exploit a second oil field, about one third the size of the Doba oil field. Modest output from the second field is intended to supply the joint-venture refinery in N'djamena, once the refinery and the needed pipeline are completed in 2012. This second oil field is projected to reduce Chad's imports of refined petroleum products, but not to increase oil exports or fiscal revenues.

8. **The oil production decline will necessitate a fiscal adjustment because financing options are limited.** Dwindling oil revenues will drive a steady decline of total government revenue (from 37 percent of non-oil GDP in 2010 to 20 percent in 2030). The successful

⁴ For CPIA methodology and results, see [IDA Country Performance ratings 2008](#).

Box 1. Baseline Macroeconomic Assumptions

The primary driver of **real GDP growth** in the baseline scenario is the steady decline of annual oil production over the next twenty years (¶7). Non-oil growth should increase above its long term average in the short term owing to the construction of the second oil field, an oil refinery, a new power plant, and the impact of road construction on internal trade. After that, non-oil growth is expected to return to its pre-oil era trend growth.

Inflation moderates rapidly in the short term to stabilize at a level consistent with the CEMAC convergence criterion of maximum 3 percent per year (Table 1b).

The **current account** remains in significant deficit until the new pipeline and refinery are complete and operational in 2012, at which time construction-related and refined petroleum product imports drop significantly. Similarly, strong FDI, associated with the refinery and other investment projects, slows upon their completion in 2012 (¶7, Table 1a).

The **fiscal outlook** is dominated by dwindling oil revenues and limited financing options. The authorities adjust primarily by restraining expenditure, but also with tax policy and administration reforms that increase non-oil revenue (¶8).

External financing consists of project loans from official multilateral and bilateral creditors to finance public investment, but at less concessional terms over time, and stable official grants and other net transfers (¶10 and Table 1a).

exploitation of the second oil field and refinery under construction would not significantly alter the downward path of revenue, as this oil field is only about one third of the size of the Doba oil field, and the profitability of the projects hinges on yet to be resolved logistical and other issues. It is assumed that the authorities will adjust to this permanent decline of oil revenue because their financing options are limited: savings at the central bank are practically exhausted; the central bank's statutory advance ceilings are declining gradually; the central bank window will close in 2014; and sustained external finance has been identified only for project loans. The fiscal adjustment is assumed to be accomplished primarily by restraining expenditure, but also by increasing non-oil revenue, through tax policy and revenue administration reforms.

9. **In the short term, debt ratios will increase significantly owing to two large non-concessional external loans.** These loans will increase external public debt from 24 percent of GDP in 2009 to 28 percent in 2011 (Table 1a). An official creditor has agreed to lend the Government of Chad \$300 million (3.6 percent of 2009 GDP) for budget support with a grant element of about 15 percent, with 2 ½ years grace and 6 years maturity. A commercial creditor associated with the construction of the N'djamena refinery has agreed to lend the Chadian partner, the state-owned *Société des Hydrocarbures du Tchad* (SHT), €232 million (4.1 percent of 2009 GDP) at LIBOR plus 3 percent, with 5 years grace and 10 years maturity. Disbursement of the entire budget support loan is assumed in 2010, the refinery loan in equal tranches this year and next, leading to rapid debt accumulation in 2010-11 and sizeable debt service pressure in the medium term. The interest rate, grace period and maturity on these loans reduce the average grant element of external borrowing in the short term (Figure 1a). Given Chad's present very tight fiscal situation (¶2) and the prospect of steadily declining oil revenues (¶¶ 7-8), it is unlikely that creditors will offer additional financing for budget support.

10. **The evolution of public debt will be driven by the volume of project loans.** New borrowing is expected to comprise funding from IDA, AfDB, other multilateral lenders, Paris Club and non Paris Club lenders.⁵ Absent a substantial improvement in macroeconomic and public financial management performance, traditional donors (multilaterals and Paris Club) are projected to continue to provide concessional project loans at roughly the same nominal level as in the last few years. The share of new borrowing on concessional terms is projected to decline steadily over the 20-year horizon, gradually decreasing the grant element of new borrowing (Figure 1a). In the absence of an IMF arrangement, there is no target date for the HIPC completion point, and the baseline does not take into account HIPC and MDRI debt relief for which Chad is eligible (¶5). In recognition of the authorities' plans to clear accumulated arrears, and their obligation to fully repay central bank statutory advances within five years, domestic public debt declines to a negligible level by the end of 2014.

III. DEBT SUSTAINABILITY ANALYSIS

A. External Debt

11. **A continuation of current policies would quickly bring the external public and publicly-guaranteed (PPG) debt burden above the thresholds.** If the authorities were to continue to run a current account deficit far higher than the foreign direct investment (FDI) inflows in the oil sector, as they did in 2009 by running down their official foreign exchange reserves, external PPG debt would breach most of the sustainability thresholds (*Historical scenario* in Figure 1b, c, d and e; and Alternative Scenario A1 in Table 2a).

12. **Owing to the lack of financing options (¶8), maintaining the current policy stance is unlikely; the authorities will have to tighten fiscal policy in synch with the trend decline in oil revenue.** Under this baseline scenario, Chad's external debt remains below the thresholds through the projection period (Figure 1 and Table 1a).

13. **Chad's external debt burden indicators are highly sensitive to an oil price shock.** Across all indicative debt burden thresholds, the most extreme shock is a drop in export growth in 2011-12 proportional to a one-standard-deviation lower oil price (*Most extreme shock* in Figure 1 and B2 Bound Test in Table 2a). Such a shock would send the debt on a path that would breach three indicative debt burden thresholds (Figures 1b, c, and e). While severe, such a shock is plausible, given the volatility of oil prices. A shock to net non-debt creating flows (B4 Bound Test in Table 2a) results in breaches of three out of five thresholds, including one liquidity indicator, as the PV of debt service-to-export ratio is placed on an upward trajectory during the last decade of the projection horizon.

⁵ The terms of IDA, AfDB and other multilateral loans are concessional, with grant elements ranging from 35 to 52 percent.

B. Public Debt

14. **The sustainability of Chad's total public debt also hinges on fiscal adjustment.** The inclusion of domestic debt does not alter the assessment of Chad's debt sustainability. Given the limited size of Chad's domestic debt (¶3) and the fiscal adjustment underlying the baseline scenario, the public debt sustainability analysis broadly parallels the external debt sustainability analysis (Figure 2 and Table 1b).

15. **The analysis of total public debt sustainability confirms that the current fiscal stance is not sustainable.** In 2009, the authorities could accommodate a sharp reduction of oil revenue by running a large primary deficit (about 10 percent of GDP, Table 1b) which was financed by depleting the sizeable oil savings accumulated on the government's accounts at the central bank (withdrawing the equivalent of 7 percent of GDP) and using central bank statutory advances (borrowing the equivalent of 4 percent of GDP). In 2010, thanks to increased oil revenues, the authorities are expected to run a smaller primary deficit (4.9 percent of GDP), financed by drawing down a nonconcessional budget support loan (¶9). Going forward, financing options are limited (¶8). However, if the authorities were able to secure financing to maintain the current level of spending, the resulting debt path would increase steeply, leading to an unmanageable debt and debt-service burden (*Fixed Primary Balance Scenario* in Figure 2, and Alternative Scenario A2 in Table 2b). A temporary shock to real GDP growth in 2011-2012 would also impair public debt sustainability (*Most Extreme Shock* in Figure 2 and Bound Test B1 in Table 2b).

C. The Authorities' Views

16. **The authorities expressed more optimism than staffs about the medium-term fiscal outlook and their ability to raise additional debt.** They expect that the improvement in the security situation will boost non-oil economic activity and non-oil revenue and allow a decline of security spending. They noted that higher-than-projected oil prices would improve the outlook. In addition, they hope that the discovery of new oil fields and other natural resources would improve public revenue in the medium term. Finally, they believe that the debt burden thresholds applicable to Chad under the DSF are too low, considering their pressing investment needs.

D. Main Differences from the 2008 Low-Income Country Debt Sustainability Analysis

17. **The 2010 DSA projections begin from a higher initial debt burden than anticipated in the 2008 DSA, but the baseline trajectories are broadly similar.** Total public sector debt as of the end of 2009 was higher than expected in the 2008 DSA,⁶ due to higher-than-expected primary spending, financed by domestic borrowing. The extension of this spending level into 2010, financed by nonconcessional external budget support, was not foreseen in the 2008 DSA. Both scenarios hinge on the trend decline in oil production and revenue and fiscal adjustment. Whereas the rate of debt accumulation was relatively stable and positive in the 2008 DSA, a different mix and terms of external financing in the 2010 DSA (¶10) imply both stronger amortization pressures in the medium term and a declining average grant element throughout the projection period.

IV. DEBT DISTRESS CLASSIFICATION AND CONCLUSIONS

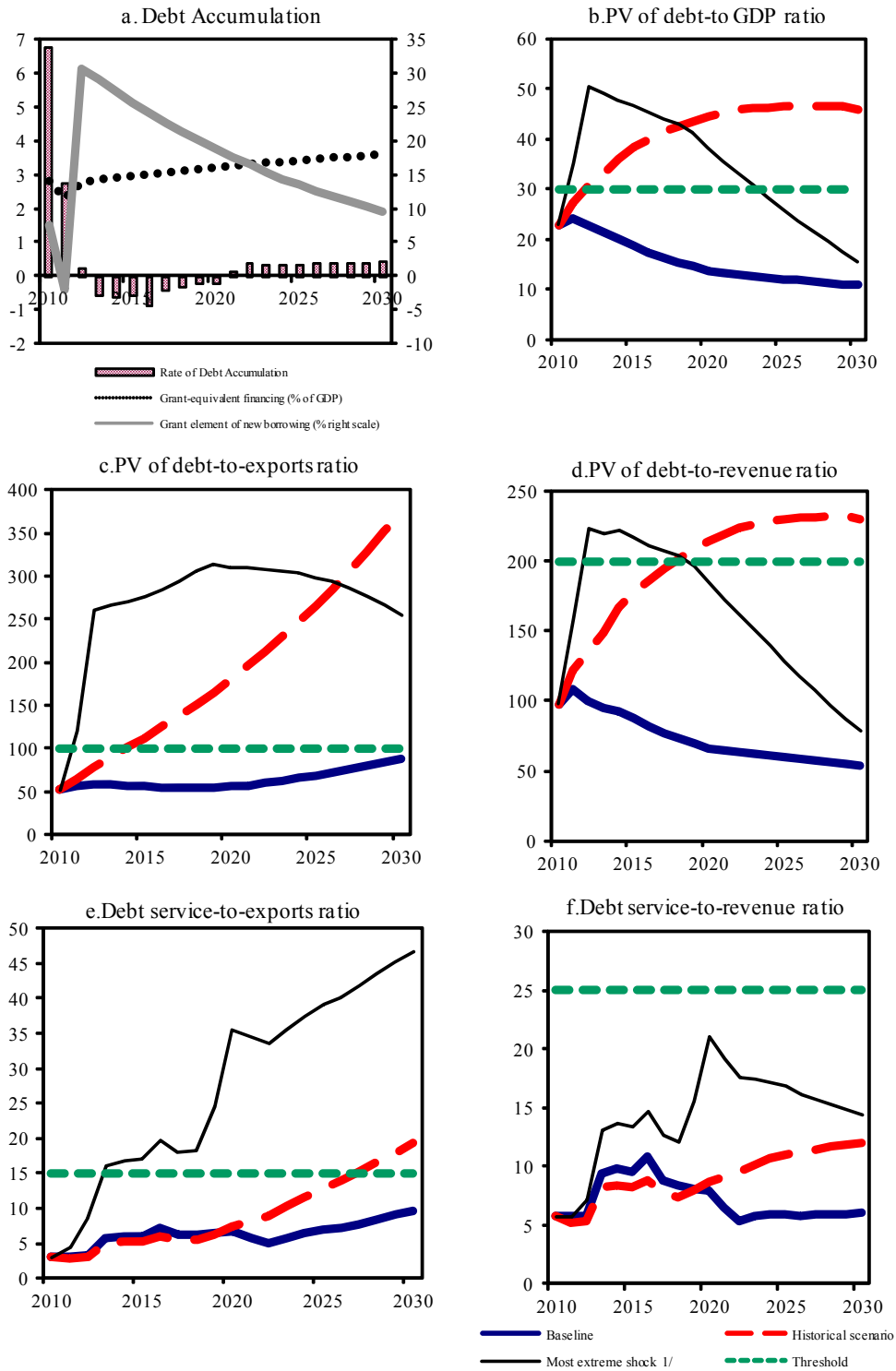
18. **Compared to last year's DSA, Chad's debt vulnerabilities have increased because the authorities have used central bank financing and contracted two large non-concessional external loans.** These two loans will lead to a sharp increase of the debt during the next two years before amortization begins. They will also make Chad's debt dynamics more vulnerable to shocks, as they will bring Chad's debt and debt service burdens closer to the thresholds in the short term.

19. **Chad's risk of debt distress remains moderate provided that the authorities adjust the fiscal stance to the decline in oil production.** Such a baseline scenario does not lead to a breach of debt-burden thresholds. However, if current policies were continued, the resulting debt path would increase steeply, leading to an unmanageable debt and debt-service burden. While the risk of debt distress remains moderate, the more rapid increase of the debt ratios than projected in the previous DSA is cause for concern.

20. **Progress toward the HIPC completion point would substantially reduce Chad's debt vulnerabilities,** as HIPC and MDRI debt relief would cut external debt in half.

⁶ [IMF Country Report No. 09/68. Chad: 2008 Article IV Consultation; Staff Supplement on Debt Sustainability Analysis.](#)

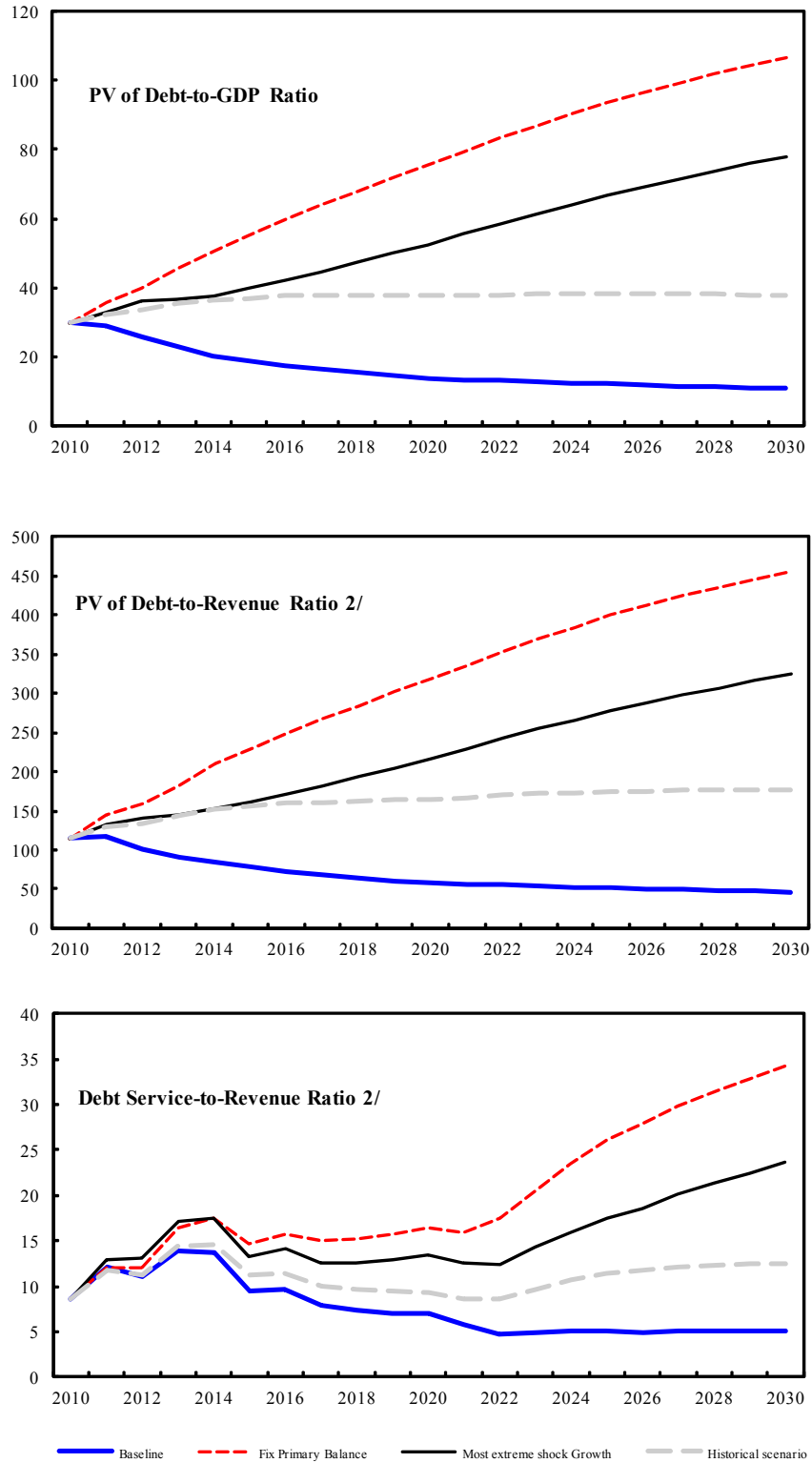
Figure 1. Chad: Indicators of Public and Publicly Guaranteed External Debt under Alternative Scenarios, 2010-2030 1/



Sources: Country authorities; and staff estimates and projections.

1/ The most extreme stress test is a shock to export growth proportional to a one-standard-deviation lower oil price in 2011 and 2012.

Figure 2.Chad: Indicators of Public Debt Under Alternative Scenarios, 2010-2030 1/



Sources: Country authorities; and staff estimates and projections.

1/ The most extreme stress test is the test that yields the highest ratio in 2020.

2/ Revenues are defined inclusive of grants.

Table 1a.: External Debt Sustainability Framework, Baseline Scenario, 2007-2030 1/
(In percent of GDP, unless otherwise indicated)

	Actual			Historical Average	Standard Deviation	Projections						2010-2015		2016-2030	
	2007	2008	2009			2010	2011	2012	2013	2014	2015	Average	2020	2030	Average
External debt (nominal) 1/	23.6	20.9	23.7			27.4	27.8	26.0	24.4	23.0	21.6		16.0	12.1	
Change in external debt	-3.6	-2.7	2.8			3.7	0.4	-1.8	-1.6	-1.4	-1.4		-0.9	-0.3	
Identified net debt-creating flows	-2.2	-4.5	21.1			9.2	3.4	0.7	1.0	0.6	1.1		2.0	2.9	
Non-interest current account deficit	10.4	13.5	33.4	26.9	27.8	32.9	26.0	7.2	7.1	6.3	6.8	14.4	7.5	6.7	7.2
Deficit in balance of goods and services	-2.5	-2.6	28.0			24.9	18.2	0.5	1.1	0.8	1.9		5.9	10.1	
Exports	54.8	52.8	42.1			43.9	42.2	38.9	36.9	35.4	33.9		24.7	12.3	
Imports	52.3	50.2	70.1			68.7	60.5	39.4	38.0	36.2	35.8		30.6	22.5	
Net current transfers (negative = inflow)	-4.0	-3.6	-4.7	-4.4	0.6	-3.0	-2.8	-2.7	-2.7	-2.7	-2.7		-3.0	-3.4	-3.1
o/w official	-2.5	-2.3	-2.7			-1.5	-1.6	-1.7	-1.7	-1.8	-1.8		-2.1	-2.7	
Other current account flows (negative = net inflow)	16.9	19.7	10.1			11.1	10.6	9.4	8.7	8.1	7.6		4.5	0.0	
Net FDI (negative = inflow)	-10.1	-14.4	-17.3	-16.9	13.4	-23.3	-21.9	-5.5	-5.5	-5.6	-5.6	-11.2	-5.4	-3.7	-4.8
Endogenous debt dynamics 2/	-2.5	-3.7	5.1			-0.5	-0.6	-0.9	-0.5	-0.1	-0.1		-0.1	0.0	
Contribution from nominal interest rate	0.2	0.2	0.4			0.4	0.4	0.5	0.5	0.5	0.5		0.3	0.3	
Contribution from real GDP growth	0.0	0.1	0.4			-0.9	-1.0	-1.4	-1.0	-0.6	-0.6		-0.4	-0.4	
Contribution from price and exchange rate changes	-2.7	-4.0	4.3			...	...	...	...	...	...		...	...
Residual 3/	-1.3	1.8	-18.3			-5.5	-3.0	-2.6	-2.6	-2.0	-2.5		-2.9	-3.2	
o/w exceptional financing	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
PV of PPG external debt	...	...	18.8			22.9	24.1	22.7	21.3	20.1	18.8		13.7	10.8	
In percent of exports	...	...	44.7			52.3	57.1	58.3	57.8	56.7	55.5		55.6	87.4	
In percent of government revenues	...	...	112.7			97.6	108.4	100.4	95.6	92.9	87.7		66.2	54.0	
Debt service-to-exports ratio (in percent)	1.5	3.5	2.8			3.1	3.0	3.4	5.7	6.0	6.1		6.7	9.7	
PPG debt service-to-exports ratio (in percent)	1.5	3.5	2.8			3.1	3.0	3.4	5.7	6.0	6.1		6.7	9.7	
PPG debt service-to-revenue ratio (in percent)	3.5	7.1	7.1			5.7	5.7	5.8	9.4	9.8	9.6		7.9	6.0	
Total gross financing need (Billions of U.S. dollars)	0.1	0.1	1.2			0.9	0.4	0.3	0.3	0.3	0.3		0.5	0.9	
Non-interest current account deficit that stabilizes debt ratio	14.0	16.2	30.6			29.2	25.5	9.0	8.6	7.7	8.1		8.4	7.0	
Key macroeconomic assumptions															
Real GDP growth (in percent)	0.2	-0.4	-1.6	7.4	10.9	4.3	3.9	5.5	4.2	2.6	2.7	3.9	2.7	3.0	2.8
GDP deflator in US dollar terms (change in percent)	11.1	20.1	-17.0	9.4	13.3	11.6	2.2	1.9	-0.4	0.6	0.7	2.8	1.6	2.9	2.2
Effective interest rate (percent) 4/	0.9	1.1	1.4	1.1	0.2	2.0	1.5	1.9	2.0	2.1	2.1	1.9	2.0	2.7	2.2
Growth of exports of G&S (US dollar terms, in percent)	8.0	15.3	-34.9	43.2	87.8	21.2	2.3	-1.1	-1.7	-0.9	-0.8	3.2	-2.3	-0.8	-1.9
Growth of imports of G&S (US dollar terms, in percent)	12.8	14.9	14.1	32.9	52.0	14.1	-6.5	-29.9	-0.1	-1.5	2.3	-3.6	0.6	4.1	1.8
Grant element of new public sector borrowing (in percent)	...	...	...	...	...	7.4	-2.0	30.6	29.0	27.3	25.6	19.7	18.8	9.5	16.0
Government revenues (excluding grants, in percent of GDP)	22.8	26.4	16.7			23.5	22.3	22.6	22.3	21.6	21.5		20.7	20.0	20.5
Aid flows (in Billions of US dollars) 5/	0.1	0.1	0.2			0.2	0.2	0.3	0.3	0.3	0.3		0.4	0.8	
o/w Grants	0.1	0.1	0.2			0.2	0.2	0.2	0.2	0.3	0.3		0.4	0.7	
o/w Concessional loans	0.0	0.0	0.0			0.03	0.03	0.03	0.03	0.03	0.03		0.03	0.03	
Grant-equivalent financing (in percent of GDP) 6/	...	...	...			2.8	2.3	2.8	2.8	2.9	2.9		3.2	3.6	3.3
Grant-equivalent financing (in percent of external financing) 6/	...	...	...			30.9	43.3	81.1	80.7	80.2	79.8		77.9	75.4	77.1
Memorandum items:															
Nominal GDP (Billions of US dollars)	7.0	8.4	6.9			8.0	8.5	9.1	9.4	9.8	10.1		12.3	20.9	
Nominal dollar GDP growth	11.3	19.6	-18.3			16.4	6.2	7.5	3.7	3.3	3.4	6.8	4.4	6.0	5.0
PV of PPG external debt (in Billions of US dollars)			1.4			1.8	2.0	2.1	2.0	2.0	1.9		1.7	2.3	
(PVI-PVI-1)/GDPI-1 (in percent)						6.8	2.8	0.2	-0.6	-0.6	-0.6	1.3	-0.2	0.4	0.1

Sources: Country authorities; and staff estimates and projections.

1/ All of Chad's external debt is public.

2/ Derived as $[r - g - \rho(1+g)] / (1+g+\rho+g\rho)$ times previous period debt ratio, with r = nominal interest rate; g = real GDP growth rate, and ρ = growth rate of GDP deflator in U.S. dollar terms.

3/ For 2009, includes a reduction in foreign reserves equivalent to 11 percent of GDP. Also includes any exceptional financing (i.e., changes in arrears and debt relief) and valuation adjustments.

4/ Current-year interest payments divided by previous period debt stock.

5/ Defined as grants, concessional loans, and debt relief.

6/ Grant-equivalent financing includes grants provided directly to the government and through new borrowing (difference between the face value and the PV of new debt).

Table 1b. Chad: Public Sector Debt Sustainability Framework, Baseline Scenario, 2007-2030
(In percent of GDP, unless otherwise indicated)

	Actual			Average	Standard Deviation	Estimate					Projections				
	2007	2008	2009			2010	2011	2012	2013	2014	2015	2010-15 Average		2020	2030	2016-30 Average
Public sector debt 1/	26.0	23.6	31.4			34.2	32.4	28.9	25.8	23.2	21.6		16.0	12.1	
o/w foreign-currency denominated	23.6	20.9	23.7			27.4	27.8	26.0	24.4	23.0	21.6		16.0	12.1	
Change in public sector debt	-3.6	-2.4	7.8			2.8	-1.8	-3.6	-3.0	-2.6	-1.6		-0.9	-0.3	
Identified debt-creating flows	-6.2	-5.6	12.4			1.6	-3.4	-4.5	-4.0	-3.0	-1.3		-0.3	0.1	
Primary deficit	-3.4	-4.8	9.8	2.4	4.8	4.9	-1.9	-2.9	-3.5	-2.7	-1.0	-1.2	0.1	0.5	0.1
Revenue and grants	24.2	27.9	20.3			25.8	24.6	25.1	24.9	24.2	24.2		23.7	23.5	
of which: grants	1.5	1.5	3.6			2.3	2.4	2.5	2.6	2.6	2.7		3.0	3.5	
Primary (noninterest) expenditure	20.8	23.1	30.1			30.7	22.7	22.2	21.3	21.5	23.2		23.8	23.9	
Automatic debt dynamics	-2.8	-0.9	2.6			-2.7	-1.5	-1.7	-0.5	-0.3	-0.3		-0.4	-0.4	
Contribution from interest rate/growth differential	-0.5	-0.3	1.0			-1.6	-1.3	-1.7	-1.1	-0.6	-0.6		-0.5	-0.3	
of which: contribution from average real interest rate	-0.5	-0.5	0.6			-0.3	0.0	0.0	0.1	0.0	0.0		0.0	0.1	
of which: contribution from real GDP growth	-0.1	0.1	0.4			-1.3	-1.3	-1.7	-1.2	-0.7	-0.6		-0.4	-0.4	
Contribution from real exchange rate depreciation	-2.2	-0.5	1.6			-1.1	-0.2	0.0	0.6	0.3	0.3		...	...
Other identified debt-creating flows	0.0	0.0	0.0			-0.5	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Privatization receipts (negative)	0.0	0.0	0.0			-0.5	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Recognition of implicit or contingent liabilities	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Debt relief (HIPC and other)	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Other (specify, e.g. bank recapitalization)	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Residual, including asset changes	2.6	3.3	-4.5			1.1	1.7	1.0	1.0	0.4	-0.3		-0.6	-0.4	
Other Sustainability Indicators															
PV of public sector debt	2.4	2.7	26.6			29.7	28.8	25.6	22.8	20.3	18.8		13.7	10.8	
o/w foreign-currency denominated	0.0	0.0	18.8			22.9	24.1	22.7	21.3	20.1	18.8		13.7	10.8	
o/w external	...	...	18.8			22.9	24.1	22.7	21.3	20.1	18.8		13.7	10.8	
PV of contingent liabilities (not included in public sector debt)	...	...	...			...	...	...	...	...	...		...	...
Gross financing need 2/	-0.8	-2.2	13.0			7.8	1.1	-0.1	0.0	0.6	1.3		1.8	1.7	
PV of public sector debt-to-revenue and grants ratio (in percent)	9.7	9.6	131.0			115.2	116.8	102.0	91.6	83.8	78.0		57.9	46.0	
PV of public sector debt-to-revenue ratio (in percent)	10.3	10.2	159.0			126.6	129.2	113.2	102.1	94.0	87.7		66.2	54.0	
o/w external 3/	...	...	112.7			97.6	108.4	100.4	95.6	92.9	87.7		66.2	54.0	
Debt service-to-revenue and grants ratio (in percent) 4/	7.7	6.9	9.5			8.7	12.1	11.1	14.0	13.6	9.5		6.9	5.1	
Debt service-to-revenue ratio (in percent) 4/	8.1	7.2	11.5			9.6	13.4	12.3	15.6	15.3	10.7		7.9	6.0	
Primary deficit that stabilizes the debt-to-GDP ratio	0.2	-2.4	2.0			2.1	-0.1	0.7	-0.5	-0.1	0.6		1.0	0.8	
Key macroeconomic and fiscal assumptions															
Real GDP growth (in percent)	0.2	-0.4	-1.6	7.4	10.9	4.3	3.9	5.5	4.2	2.6	2.7	3.9	2.7	3.0	2.8
Average nominal interest rate on forex debt (in percent)	0.9	1.1	1.4	1.1	0.2	2.0	1.5	1.9	2.0	2.1	2.1	1.9	2.0	2.7	2.2
Average real interest rate on domestic debt (in percent)	2.0	-9.0	19.9	2.6	12.4	-7.4	-0.2	0.5	2.6	0.8	-0.3	...	...	...	...
Real exchange rate depreciation (in percent, + indicates depreciation)	-8.4	-2.3	7.7	-6.3	8.8	-4.6	...	...	...	...	...	...	...	...	...
Inflation rate (GDP deflator, in percent)	1.8	11.8	-12.3	6.1	9.5	11.6	3.2	2.5	0.2	1.2	1.3	3.4	1.6	2.9	2.2
Growth of real primary spending (deflated by GDP deflator, in percent)	0.3	0.1	0.3	0.1	0.2	0.1	-0.2	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Grant element of new external borrowing (in percent)	...	...	...	...	...	7.4	-2.0	30.6	29.0	27.3	25.6	19.7	18.8	9.5	...

Sources: Country authorities; and staff estimates and projections.

1/ Gross debt of the central government including debts guaranteed for, or assumed from, state-owned enterprises.

2/ Gross financing need is defined as the primary deficit plus debt service plus the stock of short-term debt at the end of the last period.

3/ Revenues excluding grants.

4/ Debt service is defined as the sum of interest and amortization of medium and long-term debt.

5/ Historical averages and standard deviations are generally derived over the past 10 years, subject to data availability.

Table 2a. Chad: Sensitivity Analysis for Key Indicators of Public and Publicly Guaranteed External Debt, 2010-2030
(In percent)

	Projections											
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2030
PV of debt-to GDP ratio												
Baseline	23	24	23	21	20	19	17	16	15	15	14	11
A. Alternative Scenarios												
A1. Key variables at their historical averages in 2010-2030 1/	23	27	31	33	36	38	40	41	42	44	44	46
A2. New public sector loans on less favorable terms in 2010-2030 2/	23	24	23	22	21	20	19	18	17	17	16	15
B. Bound Tests												
B1. Real GDP growth at historical average minus one standard deviation in 2011-2012	23	26	27	25	24	22	20	19	18	17	16	13
B2. Export value growth at baseline minus a one-standard-deviation lower oil price in 2011-2012 3/	23	35	50	49	48	47	45	44	43	41	38	16
B3. US dollar GDP deflator at historical average minus one standard deviation in 2011-2012	23	26	25	24	23	21	20	18	17	16	15	12
B4. Net non-debt creating flows at historical average minus one standard deviation in 2011-2012 4/	23	39	38	37	35	34	33	32	31	29	27	13
B5. Combination of B1-B4 using one-half standard deviation shocks	23	35	30	28	27	26	24	23	22	21	19	12
B6. One-time 30 percent nominal depreciation relative to the baseline in 2011 5/	23	34	32	30	28	27	25	23	22	20	19	15
PV of debt-to-exports ratio												
Baseline	52	57	58	58	57	56	54	54	55	55	56	87
A. Alternative Scenarios												
A1. Key variables at their historical averages in 2010-2030 1/	52	64	79	90	102	113	125	137	151	165	180	372
A2. New public sector loans on less favorable terms in 2010-2030 2/	52	57	59	60	59	59	59	60	62	63	66	123
B. Bound Tests												
B1. Real GDP growth at historical average minus one standard deviation in 2011-2012	52	57	58	58	57	55	54	54	54	55	55	87
B2. Export value growth at baseline minus a one-standard-deviation lower oil price in 2011-2012 3/	52	120	260	267	271	276	283	294	306	313	310	254
B3. US dollar GDP deflator at historical average minus one standard deviation in 2011-2012	52	57	58	58	57	55	54	54	54	55	55	87
B4. Net non-debt creating flows at historical average minus one standard deviation in 2011-2012 4/	52	93	98	99	100	101	102	105	109	109	108	105
B5. Combination of B1-B4 using one-half standard deviation shocks	52	84	76	76	76	75	75	76	78	77	77	95
B6. One-time 30 percent nominal depreciation relative to the baseline in 2011 5/	52	57	58	58	57	55	54	54	54	55	55	87
PV of debt-to-revenue ratio												
Baseline	98	108	100	96	93	88	81	77	73	70	66	54
A. Alternative Scenarios												
A1. Key variables at their historical averages in 2010-2030 1/	98	122	135	148	167	178	187	195	202	209	214	230
A2. New public sector loans on less favorable terms in 2010-2030 2/	98	108	102	99	97	93	88	85	82	80	78	76
B. Bound Tests												
B1. Real GDP growth at historical average minus one standard deviation in 2011-2012	98	116	118	112	109	103	96	90	86	82	78	63
B2. Export value growth at baseline minus a one-standard-deviation lower oil price in 2011-2012 3/	98	158	223	220	221	217	211	207	204	197	184	78
B3. US dollar GDP deflator at historical average minus one standard deviation in 2011-2012	98	115	113	107	104	99	91	86	82	78	74	61
B4. Net non-debt creating flows at historical average minus one standard deviation in 2011-2012 4/	98	176	168	164	164	159	153	149	146	137	129	65
B5. Combination of B1-B4 using one-half standard deviation shocks	98	157	132	128	126	121	114	110	106	99	93	59
B6. One-time 30 percent nominal depreciation relative to the baseline in 2011 5/	98	153	142	135	131	124	115	109	103	98	93	76

Table 2a. Chad: Sensitivity Analysis for Key Indicators of Public and Publicly Guaranteed External Debt, 2010-2030 (continued)
(In percent)

	Projections											
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2030
Debt service-to-exports ratio												
Baseline	3	3	3	6	6	6	7	6	6	6	7	10
A. Alternative Scenarios												
A1. Key variables at their historical averages in 2010-2030 1/	3	3	3	5	5	5	6	5	6	6	7	19
A2. New public sector loans on less favorable terms in 2010-2030 2/	3	3	3	3	5	5	5	5	5	5	4	8
B. Bound Tests												
B1. Real GDP growth at historical average minus one standard deviation in 2011-2012	3	3	3	6	6	6	7	6	6	6	7	10
B2. Export value growth at baseline minus a one-standard-deviation lower oil price in 2011-2012 3/	3	4	8	16	17	17	20	18	18	25	35	47
B3. US dollar GDP deflator at historical average minus one standard deviation in 2011-2012	3	3	3	6	6	6	7	6	6	6	7	10
B4. Net non-debt creating flows at historical average minus one standard deviation in 2011-2012 4/	3	3	4	7	7	7	9	8	8	12	13	17
B5. Combination of B1-B4 using one-half standard deviation shocks	3	3	4	6	7	7	8	7	7	10	9	13
B6. One-time 30 percent nominal depreciation relative to the baseline in 2011 5/	3	3	3	6	6	6	7	6	6	6	7	10
Debt service-to-revenue ratio												
Baseline	6	6	6	9	10	10	11	9	8	8	8	6
A. Alternative Scenarios												
A1. Key variables at their historical averages in 2010-2030 1/	6	5	5	8	8	8	9	8	7	8	9	12
A2. New public sector loans on less favorable terms in 2010-2030 2/	6	6	5	5	8	7	7	7	7	6	5	5
B. Bound Tests												
B1. Real GDP growth at historical average minus one standard deviation in 2011-2012	6	6	7	11	12	11	13	10	10	10	9	7
B2. Export value growth at baseline minus a one-standard-deviation lower oil price in 2011-2012 3/	6	6	7	13	14	13	15	13	12	16	21	14
B3. US dollar GDP deflator at historical average minus one standard deviation in 2011-2012	6	6	7	11	11	11	12	10	9	9	9	7
B4. Net non-debt creating flows at historical average minus one standard deviation in 2011-2012 4/	6	6	8	11	12	12	13	11	10	15	15	11
B5. Combination of B1-B4 using one-half standard deviation shocks	6	6	7	11	11	11	12	10	10	13	11	8
B6. One-time 30 percent nominal depreciation relative to the baseline in 2011 5/	6	8	8	13	14	14	15	13	12	11	11	8
<i>Memorandum item:</i>												
Grant element assumed on residual financing (i.e., financing required above baseline) 6/	13	13	13	13	13	13	13	13	13	13	13	13

Sources: Country authorities; and staff estimates and projections.

1/ Variables include real GDP growth, growth of GDP deflator (in U.S. dollar terms), non-interest current account in percent of GDP, and non-debt creating flows.

2/ Assumes that the interest rate on new borrowing is by 2 percentage points higher than in the baseline., while grace and maturity periods are the same as in the baseline.

3/ Exports values are assumed to remain permanently at the lower level, but the current account as a share of GDP is assumed to return to its baseline level after the shock (implicitly assuming an offsetting adjustment in import levels).

4/ Includes official and private transfers and FDI.

5/ Depreciation is defined as percentage decline in dollar/local currency rate, such that it never exceeds 100 percent.

6/ Applies to all stress scenarios except for A2 (less favorable financing) in which the terms on all new financing are as specified in footnote 2.

Table 2b. Chad: Sensitivity Analysis for Key Indicators of Public Debt 2010-2030

	Projections							
	2010	2011	2012	2013	2014	2015	2020	2030
PV of Debt-to-GDP Ratio								
Baseline	30	29	26	23	20	19	14	11
A. Alternative Scenarios								
A1. Real GDP growth and primary balance are at historical averages	30	32	33	35	37	37	38	38
A2. Primary balance is unchanged from 2010	30	36	40	45	51	55	75	107
A3. Permanently lower GDP growth 1/	30	30	28	28	28	30	50	148
B. Bound Tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2011-2012	30	33	36	37	38	40	53	78
B2. Primary balance is at historical average minus one standard deviations in 2011-2012	30	38	44	42	39	38	33	27
B3. Combination of B1-B2 using one half standard deviation shocks	30	36	42	40	39	38	39	43
B4. One-time 30 percent real depreciation in 2011	30	39	35	32	30	28	23	20
B5. 10 percent of GDP increase in other debt-creating flows in 2011	30	39	35	32	30	29	24	19
PV of Debt-to-Revenue Ratio 2/								
Baseline	115	117	102	92	84	78	58	46
A. Alternative Scenarios								
A1. Real GDP growth and primary balance are at historical averages	115	130	134	144	153	156	165	176
A2. Primary balance is unchanged from 2010	115	144	159	183	209	229	318	455
A3. Permanently lower GDP growth 1/	115	122	113	111	114	121	204	578
B. Bound Tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2011-2012	115	132	141	145	153	162	217	324
B2. Primary balance is at historical average minus one standard deviations in 2011-2012	115	154	177	168	163	157	138	117
B3. Combination of B1-B2 using one half standard deviation shocks	115	146	165	159	158	158	162	182
B4. One-time 30 percent real depreciation in 2011	115	157	140	129	123	117	98	87
B5. 10 percent of GDP increase in other debt-creating flows in 2011	115	157	141	131	124	119	99	82
Debt Service-to-Revenue Ratio 2/								
Baseline	9	12	11	14	14	9	7	5
A. Alternative Scenarios								
A1. Real GDP growth and primary balance are at historical averages	9	12	11	15	15	11	9	13
A2. Primary balance is unchanged from 2010	9	12	12	16	18	15	16	34
A3. Permanently lower GDP growth 1/	9	12	12	15	15	12	13	33
B. Bound Tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2011-2012	9	13	13	17	17	13	13	24
B2. Primary balance is at historical average minus one standard deviations in 2011-2012	9	12	12	17	17	13	10	13
B3. Combination of B1-B2 using one half standard deviation shocks	9	12	13	17	17	13	11	16
B4. One-time 30 percent real depreciation in 2011	9	13	13	18	18	14	11	11
B5. 10 percent of GDP increase in other debt-creating flows in 2011	9	12	13	16	15	11	9	9

Sources: Country authorities; and staff estimates and projections.

1/ Assumes that real GDP growth is at baseline minus one standard deviation divided by the square root of the length of the projection period.

2/ Revenues are defined inclusive of grants.