INTERNATIONAL DEVELOPMENT ASSOCIATION
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CHAD

# Joint Bank-Fund Debt Sustainability Analysis Under the Debt Sustainability Framework for Low-Income Countries

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*Based on the external Low-Income Country (LIC) Debt Sustainability Analysis (DSA), Chad's risk of debt distress is moderate although subject to important risks in the external environment and the conduct of economic policy. The inclusion of domestic debt does not alter the assessment of Chad's risk of debt distress.*[1]

## I. Background

### Recent Developments in external debt

1. Chad's external debt situation has improved considerably over the past few years, thanks to the strong growth in overall GDP stemming from the oil sector, reduced external financing, and continued debt servicing. By end-2005—the basis for the last DSA[2]—the stock of debt had already declined to below 30 percent of GDP, from over 60 percent at the HIPC Initiative decision point. Since then, it has declined further to 23 percent of GDP at end-2007. All of Chad's external debt is public debt, and the bulk is owed to the multilateral creditors IDA and the African Development Bank (AfDB) (see Text Table 1). Nominal debt

[1] The DSA has been produced jointly by World Bank and Fund staffs in consultation with the staff of the African Development Bank. The fiscal year for Chad is January through December.

[2] The last DSA was submitted to the Boards of the WB and IMF on December 11, 2006. It can be found in the Chad section of the IMF public website, www.imf.org., among the papers published in January 2007 for the 2006 Article IV Consultation.

levels are sensitive to exchange rate changes, mainly through the Euro-dollar rate given that the CFA franc has a fixed parity with the Euro (about one quarter of debt is denominated in Euro or CFA). Debt levels have been reduced further because Chad made principal payments as scheduled while contracting only moderate amounts of new debt. Moreover, disbursements suffered when creditors started encountering problems in project execution. In 2008, the debt stock declined significantly after Chad prepaid to the IBRD the balance on the loan that financed the government's equity share in the oil pipeline plus to IDA the two associated credits for capacity building (around CFAF 31 billion in total).

2. Chad's debt management is guided by the framework adopted in March 2007 by the Economic and Monetary Community of Central Africa (CEMAC) to which it belongs.[3] In that context, Chad's debt management capacity has been significantly strengthened. A new software introduced in 2008 permits the integration of domestic and external debt. It will also be used to publish a new statistical bulletin, and the debt department is planning its own website. Starting 2009, to get a better grip on treasury arrears (*arrierés comptables*) any unpaid bills at the end of the complementary period of the budget year will be formally recognized as debt and transferred to the debt department.

**External debt relief—HIPC Initiative and MDRI**

3. Chad is eligible for the enhanced Heavily-Indebted Poor Countries (HIPC) Initiative. The decision point was reached on May 24, 2001, and HIPC Initiative debt relief was estimated at US$170 million in 2001 NPV terms (of which US$68 million by IDA and US$18 million by the IMF). Part was to be delivered as interim assistance with the remainder at the completion point. Creditors delivering interim assistance to Chad include IDA, IMF, AfDB, the Paris Club, and other bilateral creditors. However, in the seven years that elapsed, most creditors have reached the limit of their interim relief (the IMF in 2005, the AfDB in 2006 and IDA in 2007).[4]

4. Macroeconomic performance and political obstacles have prevented Chad from reaching the HIPC Initiative completion point. Specifically, Chad's inability to meet agreed fiscal targets and satisfactorily implement a program under the IMF's Poverty Reduction and Growth Facility (PRGF)—a key completion point trigger—has been the principal obstacle. The 2005 PRGF expired in 2008 without any reviews being concluded. Subsequent efforts in

[3] To find a copy, Google "CEMAC Reglement No. 12/07-UEAC-186-CM-15."

[4] The IDA, IMF and AfDB provided close to CFAF 40 billion in HIPC interim relief.

Text Table 1. Chad: Recent Developments in Debt, 2001-08
(Billions of CFA francs)

| | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|
| | | | | Stock of debt | | | | |
| **Overall total** | 794.7 | 786.6 | 736.9 | 797.2 | 898.9 | 896.2 | 794.0 | 745.2 |
| (Percent of GDP) | 63.4 | 56.8 | 46.3 | 34.2 | 29.0 | 27.2 | 23.6 | 19.9 |
| **Multilateral institutions** | 678.1 | 687.7 | 652.5 | 715.3 | 810.2 | 805.5 | 718.6 | |
| IMF | 65.3 | 67.3 | 57.0 | 47.7 | 47.5 | 37.4 | 25.4 | |
| World Bank/IDA | 380.6 | 398.3 | 394.0 | 444.5 | 507.8 | 486.1 | 453.4 | |
| African Development Fund/Bank | 182.8 | 169.8 | 159.9 | 168.5 | 179.8 | 205.8 | 173.7 | |
| EIB | 3.9 | 7.9 | 7.3 | 13.0 | 13.0 | 12.4 | 9.9 | |
| Others | 45.5 | 44.4 | 34.2 | 41.6 | 62.0 | 63.8 | 56.2 | |
| **Bilateral creditors** | 116.2 | 98.6 | 84.1 | 81.9 | 88.8 | 90.7 | 75.4 | |
| Paris Club official debt | 30.2 | 25.8 | 24.0 | 25.2 | 24.3 | 23.2 | 23.6 | |
| Pre-cut-off | 25.0 | 21.0 | 20.3 | 21.7 | 21.4 | 20.9 | 21.9 | |
| *Of which:* France | 21.0 | 17.4 | 16.8 | 17.3 | 17.6 | 17.4 | 18.5 | |
| Italy | 3.3 | 2.8 | 2.8 | 2.7 | 3.1 | 2.8 | 2.7 | |
| Post cut-off date | 5.2 | 4.9 | 3.7 | 3.5 | 2.9 | 2.3 | 1.7 | |
| *Of which:* Spain | 4.2 | 4.1 | 3.0 | 2.8 | 2.1 | 1.6 | 1.1 | |
| Non-Paris Club official debt | 86.1 | 72.7 | 60.1 | 56.7 | 64.4 | 67.5 | 51.8 | |
| *Of which:* China, People's Republic | 28.6 | 25.4 | 22.0 | 13.6 | 15.4 | 13.9 | - | |
| Taiwan, Province of China | 29.2 | 25.0 | 20.8 | 19.2 | 20.8 | 16.2 | 15.0 | |
| Saudi Arabia | 10.4 | 9.3 | 6.2 | 15.2 | 16.9 | 14.4 | 11.4 | |
| Kuwait | 15.3 | 12.9 | 11.0 | 8.6 | 11.2 | 11.7 | 10.8 | |
| **Other creditors** | 0.4 | 0.4 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 | |
| | | | | Debt disbursements | | | | |
| **Overall total** | 45.0 | 83.6 | 52.8 | 96.7 | 64.9 | 67.9 | 23.5 | |
| **Multilateral institutions** | 44.6 | 83.6 | 52.8 | 94.2 | 63.5 | 59.6 | 17.9 | |
| IMF | 12.8 | 12.2 | 0.0 | 0.0 | 3.3 | 0.0 | 0.0 | |
| World Bank/IDA | 17.8 | 57.1 | 42.1 | 60.9 | 33.1 | 14.0 | 6.5 | |
| African Development Fund/Bank | 5.6 | 3.6 | 9.3 | 17.1 | 12.5 | 38.6 | 6.4 | |
| EIB | 0.0 | 4.0 | 0.0 | 6.7 | 0.0 | 0.0 | 0.0 | |
| Others | 8.4 | 6.6 | 1.3 | 9.5 | 14.5 | 7.0 | 4.9 | |
| **Bilateral and Commercial** | 0.4 | 0.0 | 0.0 | 2.5 | 1.4 | 8.3 | 5.6 | |
| Paris Club offical debt | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Non-Paris Club official debt | 0.4 | 0.0 | 0.0 | 2.5 | 1.4 | 8.3 | 5.6 | |
| Other creditors | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| | | | | Debt service | | | | |
| **Principal total** | 10.1 | 17.5 | 20.8 | 17.4 | 22.0 | 27.4 | 19.5 | 55.9 |
| **Multilateral** | 8.2 | 15.4 | 14.9 | 15.3 | 18.5 | 23.1 | 16.8 | 52.0 |
| IDA | 3.5 | 4.2 | 4.0 | 3.3 | 3.1 | 7.4 | 4.2 | 6.7 |
| IBRD | 0.0 | 0.0 | 0.0 | 0.0 | 1.3 | 0.0 | 0.0 | 34.2 |
| IMF | 2.4 | 4.9 | 4.4 | 7.8 | 7.4 | 9.5 | 6.7 | 3.2 |
| AfDB | 0.8 | 2.1 | 2.0 | 2.0 | 3.1 | 2.7 | 2.6 | 3.2 |
| Others | 1.5 | 4.2 | 4.5 | 2.1 | 3.6 | 3.6 | 3.3 | 4.7 |
| **Bilateral and Commercial** | 1.9 | 2.0 | 6.0 | 2.0 | 3.5 | 4.2 | 2.6 | 3.9 |
| Paris Club offical debt | 0.2 | 0.5 | 2.8 | 0.3 | 0.8 | 0.8 | 0.7 | 0.7 |
| Non-Paris Club official debt | 0.3 | 0.5 | 1.4 | 1.3 | 2.2 | 3.4 | 1.9 | 3.2 |
| Other creditors | 1.4 | 1.0 | 1.7 | 0.4 | 0.5 | - | - | - |
| **Interest total** | 4.5 | 7.8 | 10.1 | 6.8 | 8.2 | 9.5 | 7.6 | 9.8 |
| **Multilateral** | 3.6 | 5.9 | 5.8 | 5.7 | 6.6 | 7.6 | 5.6 | 7.2 |
| IDA | 2.3 | 2.9 | 2.9 | 3.0 | 2.8 | 4.4 | 2.5 | 3.4 |
| IMF | 0.3 | 0.3 | 0.2 | 0.4 | 0.3 | 0.3 | 0.1 | 0.1 |
| AfDB | 0.5 | 1.8 | 1.5 | 1.5 | 1.8 | 1.8 | 1.1 | 1.5 |
| Others | 0.5 | 0.9 | 1.3 | 0.8 | 1.8 | 1.2 | 1.8 | 2.3 |
| **Bilateral and Commercial** | 0.9 | 2.0 | 4.2 | 1.0 | 1.6 | 1.8 | 2.0 | 2.6 |
| Paris Club offical debt | 0.1 | 0.1 | 2.8 | 0.5 | 0.4 | 1.6 | 0.4 | 1.5 |
| Non-Paris Club official debt | 0.7 | 1.7 | 1.4 | 0.5 | 1.1 | 0.3 | 1.6 | 1.1 |
| Other creditors | 0.2 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

Source: Chadian authorities.

2008 to develop a policy track record to a new PRGF through a Staff-Monitored Program were derailed by further fiscal slippages. The timing of the completion point will depend on the authorities' efforts to progress to a new PRGF arrangement, and satisfactory performance under the PRGF-supported program. Besides this, the completion point requires one year satisfactory implementation of the Poverty Reduction Strategy Paper (PRSP), and meeting a number of floating completion point triggers in governance and five priority sectors.[5] The Government of Chad adopted a new PRSP in April 2008.

5. Upon reaching the HIPC Initiative completion point, Chad would also become eligible for debt relief under the Multilateral Debt Relief Initiative (MDRI). MDRI relief covers the full stock of debt owed to three multilateral creditors, IDA, IMF, and the African Development Fund (AfDF) that remains at the time of the completion point on disbursements before end-2004 in the case of IMF and AfDF and before end-2003 in the case of IDA. For Chad, MDRI debt relief would be equivalent to approximately US$1 billion in nominal terms over 45 years or US$567 million in end-2006 NPV terms.

**Public domestic debt**

6. Chad has no public domestic debt instruments. CEMAC plans for creating a domestic securities market have been slow in coming to fruition. Nonetheless Chad has a stock of domestic debt resulting from past arrears. Building on the work of several government debt commissions, an independent auditor identified in 2006 claims worth CFA 142 billion (4.6 percent of GDP) as of end-2005, to be paid either immediately or upon further verification. The debt is reported in three categories: treasury arrears (*arrierés comptables*), from the current or previous budget years; rescheduled debt (*debt conventionnées*); and legal obligations (*engagements juridiques*) (see Text Table 2).

7. Since 2005, public domestic debt has fallen as a result of repayments even though new debts were added. All domestic debt is in national currency. Only a small portion of the rescheduled debt earns interest. 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. A partial domestic debt repayment plan envisaging payment of CFAF 40 billion over 2008-10 was adopted in April 2008. In July 2008, a government commission started to update the stock of debt as of end-2007 and complete the necessary verification to enable the government to adopt a final arrears clearance and domestic debt settlement plan in early 2009. No public debt guarantees are registered in the debt department.

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[5] See Box 11 on page 30 in the Decision Point document dated May 4, 2001, which can be found http://siteresources.worldbank.org/INTDEBTDEPT/DecisionPointDocuments/20707479/Chad-E-DP.pdf.

Text Table 2. Chad: Stock of Public Domestic Debt, 2005-08

| | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|
| | (Billions of CFA francs) | | | |
| Budget arrears | 34.1 | 24.8 | 22.3 | 1.3 |
| Rescheduled debts | 69.4 | 71.8 | 52.4 | 33.7 |
| Legal commitments | 38.6 | 31.3 | 24.5 | 24.5 |
| Total | 142.2 | 127.9 | 99.2 | 59.4 |
| | (Percent of GDP) | | | |
| Total | 4.6 | 3.9 | 3.0 | 1.6 |

Source: Chadian authorities.

## II. Underlying DSA Assumptions

8. Over the 20 year period covered by the DSA, Chad's macroeconomic performance will be much affected by the gradual depletion of its current oil resources and the policy reactions to its economic implications. The basic macroeconomic assumptions underlying the baseline scenario are summarized in Text Table 3.

Text Table 3. Chad: Macroeconomic Assumptions for the Baseline DSA 2008-2028

| | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2008-2013 Average | 2014-2028 Average |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Real Sector** | (Percent growth, unless otherwise indicated) | | | | | | | | | | |
| GDP in constant prices | 7.9 | 0.2 | 0.2 | -0.4 | 3.6 | 3.5 | 3.6 | 2.7 | 2.5 | 2.6 | 3.8 |
| Non-oil sectors | 11.0 | 4.7 | 3.1 | 3.2 | 5.0 | 4.7 | 4.7 | 4.7 | 4.7 | 4.5 | 4.8 |
| Oil sector | 1.5 | -10.5 | -7.7 | -11.6 | -1.5 | -1.2 | -1.0 | -6.1 | -8.1 | -4.9 | -8.1 |
| Oil production (millions of barrels) | 62.9 | 56.7 | 52.4 | 46.5 | 45.6 | 45.6 | 45.6 | 43.3 | 39.8 | 44.4 | 19.3 |
| Reference oil price (US$/barrel) | 53.4 | 64.3 | 71.1 | 97.0 | 50.0 | 60.0 | 64.8 | 67.0 | 68.8 | 67.9 | 86.8 |
| Inflation (percent, GDP deflator) | 23.1 | 6.2 | 1.8 | 11.9 | -19.0 | 7.5 | 3.8 | 1.9 | 1.2 | 1.2 | 2.3 |
| **Balance of Payments** | (Percent of GDP, unless otherwise indicated) | | | | | | | | | | |
| Current account balance | -17.4 | 2.4 | -9.0 | -10.5 | -9.5 | -19.6 | -8.6 | -8.8 | -7.7 | -10.8 | -10.0 |
| Imports of goods and services | -48.6 | -51.5 | -52.2 | -48.8 | -51.0 | -47.2 | -46.7 | -45.1 | -44.1 | -47.2 | -35.6 |
| Exports of goods and services | 55.5 | 56.4 | 54.8 | 56.2 | 33.9 | 36.5 | 36.9 | 36.0 | 29.6 | 38.2 | 21.5 |
| *Of which:* oil exports | 46.2 | 47.1 | 45.6 | 47.4 | 23.0 | 26.1 | 26.6 | 25.5 | 18.9 | 27.9 | 8.8 |
| Net factor incomes | -9.8 | -18.3 | -17.1 | -20.0 | -7.9 | -2.7 | -3.3 | -3.4 | -2.3 | -6.6 | -0.6 |
| Current transfers | 5.3 | 4.4 | 4.0 | 3.2 | 5.3 | 4.8 | 4.3 | 4.7 | 4.8 | 4.5 | 4.9 |
| Import volumes (percent change) | -13.7 | -21.7 | 0.2 | -3.6 | -1.5 | 1.8 | 3.1 | 3.1 | 2.9 | 1.0 | -1.6 |
| Export volumes (percent change) | 231.6 | -0.7 | -12.3 | -8.2 | -14.3 | 4.2 | 0.4 | 0.7 | -5.0 | -3.7 | 2.4 |
| **Government balances** | (Percent of GDP, unless otherwise indicated) | | | | | | | | | | |
| Public sector revenues (incl. grants) | 12.7 | 18.8 | 24.2 | 29.4 | 11.3 | 15.6 | 16.9 | 18.1 | 17.4 | 18.1 | 18.3 |
| *Of which:* oil revenue | 4.6 | 12.2 | 16.8 | 22.6 | 3.2 | 6.7 | 7.8 | 8.0 | 6.6 | 9.1 | 2.7 |
| Public sector expenditures | 13.1 | 16.5 | 21.1 | 22.9 | 19.5 | 15.0 | 15.2 | 15.5 | 16.3 | 17.4 | 18.9 |
| *Of which:* interest expenditures | 0.3 | 0.4 | 0.4 | 0.4 | 0.4 | 0.3 | 0.2 | 0.2 | 0.2 | 0.3 | 0.2 |
| Primary deficit | -4.1 | 0.0 | 1.3 | 4.7 | -9.9 | -1.6 | -0.5 | -0.1 | -1.7 | -1.5 | -3.9 |
| Non-oil primary deficit (percent of non-oil GDP) | -5.2 | -15.0 | -22.0 | -28.1 | -14.4 | -7.9 | -7.9 | -7.5 | -7.4 | -12.2 | -4.0 |

Sources: Chadian authorities; and staff projections.

9. Oil is a critical determinant of Chad's economic outlook. While exploration is ongoing, Chad's "proved"[6] oil reserves have not changed since the commencement of production in the Doba field. To be conservative, no new discoveries have been factored in. Long-term oil production projections are therefore based on the gradual depletion of the Doba field, with annual production declining from 46 million barrels in 2008 to 11 million in 2028. Due to its quality, Chad's oil sells at a discount of $10-15 per barrel relative to international reference prices such as Brent. For the medium term, the base line assumes the reference oil price behaves in line with the latest IMF projections used for the World Economic Outlook; for the long term, the baseline assumes oil prices will trend in real terms towards the price level attained in 2006 of about $60 per barrel.[7] For the outer years oil revenue—the government "take"—is assumed to be 50 percent of gross oil revenues.

10. As oil production trends down, non-oil real growth is assumed to pick up to 4-5 percent, resulting in overall GDP growth of 3-4 percent. This economic diversification will have benefited from the productivity-enhancing investments in human and physical infrastructure financed with the oil revenues. But it is also predicated on a general improvement in the private sector business climate. The balance of payments reflects these trends with growing non-oil exports gradually substituting for declining oil exports.

11. The assumed fiscal policy reaction to the decline in oil revenues is a combination of adjustment—reducing expenditures—and financing—raising revenues through the broad-based taxation of the growing non-oil sectors, targeting a non-oil primary deficit of below 4 percent which a permanent income analysis suggests would be sustainable. It is highly preferable that this adjustment comes about through a forward-looking medium-term budget policy that respects the government's anti-poverty objectives. If not, then a more costly adjustment will be forced by the inevitable decline in oil revenue absent other financing possibilities.

12. Assumed in the baseline is that Chad, currently one of the ten poorest countries in the world, will remain over the projection period, an IDA-eligible country. It should therefore continue to receive external financial support through project and program grants and loans on a concessional basis. Presently total grants and loans are at an unusually low level: in terms of GDP, the 2007 level was only half that of 2004. As oil revenue declines and Chad improves its governance and relations with development partners, this level is projected to

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[6] Proved reserves are those quantities of petroleum which, by analysis of geological and engineering data, can be estimated with reasonable certainty to be commercially recoverable from a given date forward, from known reservoirs and under current economic conditions, operating methods, and government regulations.

[7] This is the International Energy Agency's projection for oil prices 20 years ahead in its 2007 World Energy Outlook.

pick up somewhat. Of new borrowing, 70 percent is assumed to have a grant element of around 60 percent (IDA terms) and 30 percent a grant element of 35 percent. The combined effect of the grants and concessional borrowing is to raise the grant-equivalent financing to 3.6 percent of GDP in the outer years. Following the settlement of current domestic debt by 2010, a small build-up of new debt is projected, in line with CEMAC plans for stimulating domestic government securities. In the absence of a PRGF arrangement, there is no target date for the HIPC completion point, and the baseline therefore does not take into account possible debt relief.

## III. External DSA

### A. Baseline

13. A standard component of a LIC DSA is to assess the external debt burden indicators in relation to policy-dependent thresholds because of the key empirical finding that LICs with better quality policies and institutions can sustain a higher level of external debt. Policy performance is classified as strong, medium and weak depending on the country's rating on the World Bank's Country Policy and Institutional Assessment (CPIA). Chad's rating is very low, 2.77 on average for 2005-07, which puts it in the Weak Policy category. Moreover, Chad's CPIA declined from 2.9 in 2005 to 2.6 in 2007.[8] The corresponding thresholds together with Chad's performance under the baseline are shown in Text Table 4; the debt ratios are in present value (PV) terms. Under the baseline scenario the indicators of Chad's public- and publicly-guaranteed debt are always comfortably below the threshold values. Moreover, the ratios are either stable or declining, suggesting the outlook is favorable.

Text Table 4. Chad: Thresholds for "Weak Policy Performance" and External Debt Burden Indicators

| | Threshold Levels | Chad under Baseline Scenario | | | |
|---|---|---|---|---|---|
| | Weak Performance | 2007 | 2008-28 1/ | Peak Level | Peak Year |
| NPV of external debt in percent of: | | | | | |
| GDP | 30 | 17 | 12 | 17 | 2009 |
| Exports | 100 | 32 | 47 | 57 | 2020 |
| Revenue | 200 | 76 | 77 | 151 | 2009 |
| External debt service in percent of: | | | | | |
| Exports | 15 | 2 | 3 | 4 | 2017 |
| Revenue | 25 | 4 | 6 | 12 | 2009 |

1/ Simple average.

[8] For CPIA methodology and results, see http://go.worldbank.org/AL5SDP3T90.

### B. Alternative Scenarios and Stress Tests

14. The LIC DSA template subjects the baseline external debt projections to a number of standard stress tests, namely two alternative scenarios and six bound tests (see Table 2a). The charts in Figure 1 show how the ratios behave under the baseline and the most extreme of the stress tests relative to the thresholds. The alternative "historical" scenario assumes key variables stay at their historical averages. In Chad's case this implies that the fairly large current account deficits of the past—on account of oil sector imports—continue, financed mostly by large foreign direct investment inflows, but still generating a debt build up. As a result in Figure 1, panel c the historical ratio crosses the performance-based threshold. Given that larger current account deficits could derive from several factors, including lower oil prices, this scenario indicates the sensitivity of the baseline to balance of payments shocks.

15. Five of the six standard bound tests involve "shocking" key variables in the first two years of the projection period by setting them one standard deviation below their historical average. The sixth test assumes a 30 percent depreciation in the first year only. The charts show the test yielding the most extreme result, that is, the highest ratio, in 2018. In two instances (Figure 1, panels c and e) this turns out to be "export growth," and in three instances (Figure 1, panels b, d, and f) the "depreciation" test. For two of the five ratios the extreme bound tests cross the thresholds (see Figure 1, panels c and d). For the PV of debt-to-exports ratio under the "export growth" test this reflects the high historical volatility of Chad's exports due to the coming on stream of oil production in 2003. The test assumes minus 40 percent export growth in 2009 and 2010. This shock is severe but not impossible given the extreme oil price volatility to which Chad is subject (e.g., the price Chad fetched for its oil at end-2008 was 60 percent below the peak price of July 2008).

## IV. PUBLIC DSA

### A. Baseline

16. All of Chad's external debt is public debt, and domestic public debt is limited. The baseline assumes repayment of the current stock of domestic debt by 2010, followed by a small build-up of domestic debt (CFAF 5 billion per year) over the projection period as a market for domestic securities is developed. Growth in non-oil revenue compensates for the loss in oil revenue. On those assumptions, the analysis of the sustainability of public debt under the baseline confirms broadly the conclusion of the previous analysis that Chad's debt outlook is favorable (see Figure 2). Peaking in 2009 due to the sudden sharp drop in revenue, the three ratios show a slight steady decline over the projection period.

### B. Alternative Scenarios and Stress Tests

17. In the LIC DSA, the baseline public debt projections are subjected to three scenarios and five bound tests (see Table 2b). Figure 2 compares the ratios under these scenarios with the baseline. As in the case of external debt, the "historical" scenario sets key variables at their historical average. Under this scenario Chad will incur primary deficits over the projection period, which generate additional debt, rather than the surpluses of the baseline.[9] The result is a significant deterioration in all three ratios relative to the baseline over the long term. The "historical" scenario indicates how sensitive the baseline is to the assumption that growing non-oil revenue will compensate for declining oil revenue. Under the scenario "fix primary balance" the unusually large primary surplus of 2008 continues and as a result all debt is repaid rapidly.

18. The most extreme bound test is the "lower long-run GDP growth," which assumes lower real GDP growth over the full projection period. For 2009-28 it implies an average growth rate of 1.4 percent compared to 3.6 percent under the baseline. Under this test, the three ratios move rapidly away from the baseline, with PV of debt-to-GDP reaching 100 percent in the outer years. The 1.4 percent rate is actually quite close to the overall real GDP growth rate that would result if non-oil GDP growth did not accelerate as assumed under the baseline to 4.8 percent per year but stayed at 3.6 percent, the rate achieved over 1988-97, the decade preceding the development of the oil sector. That lower non-oil GDP growth rate, in combination with the decline in oil GDP, would result in overall real GDP growth for 2009-28 of 1.3 percent per year on average. Hence, the worrisome trends of this bound test expose the sensitivity of the baseline to the non-oil growth assumption.

## V. Debt Distress Classification and Conclusions

19. In the staff's view Chad should be considered at moderate risk of debt distress based on external debt burden indicators. The inclusion of domestic debt does not alter the assessment of Chad's risk of debt distress. This assessment, "moderate risk," is justified by the fact that while the baseline scenario does not indicate a breach of thresholds, the "historical" scenario does and so do two of the bound tests. It is further justified by the fact that the conduct of economic policy and debt management imply sizeable risks to the baseline.

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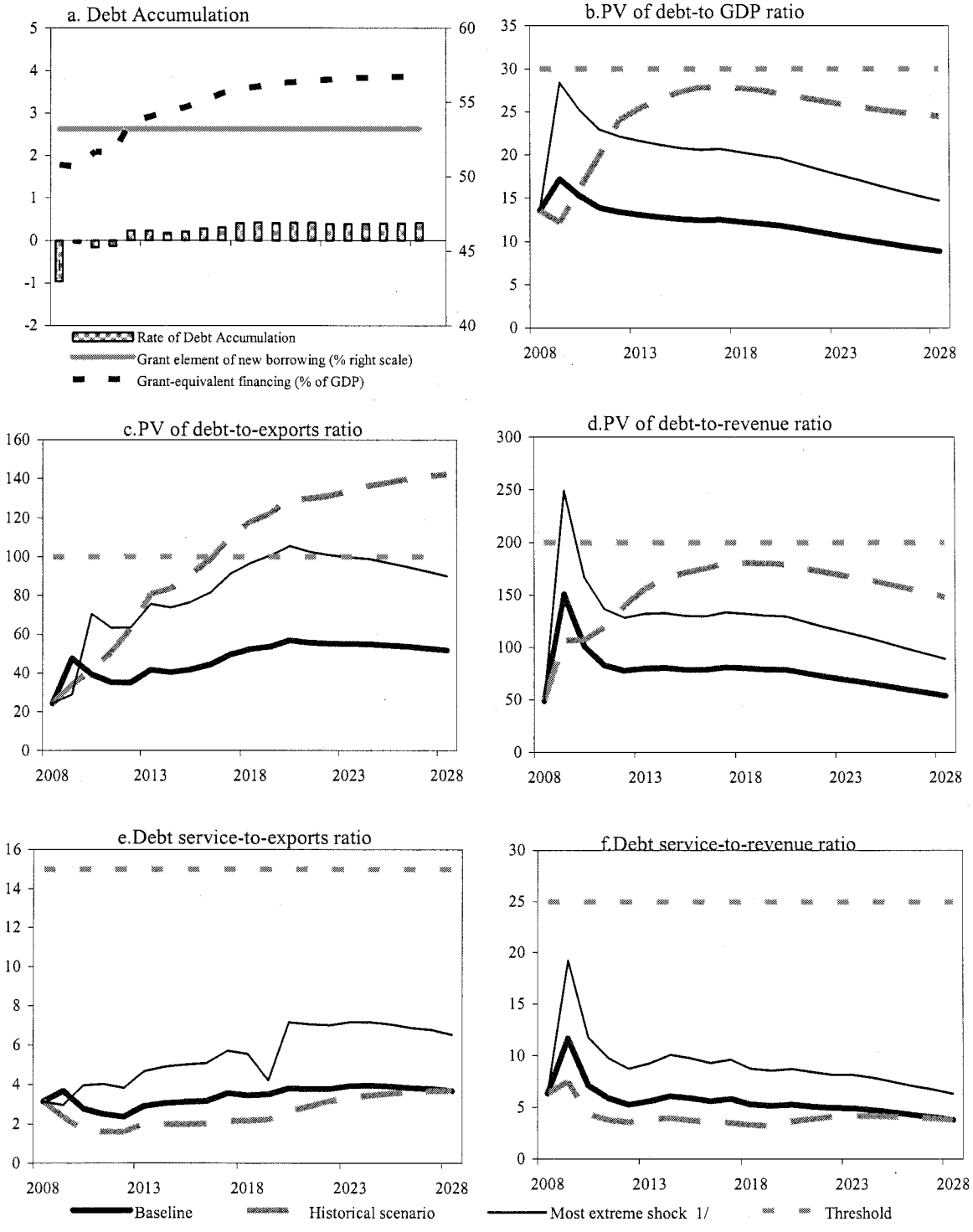
[9] The baseline projects primary *surpluses* of 1.5 percent of GDP over 2008-13, thanks to oil revenue, whereas the "historical" scenario assumes *deficits* of 1.1 percent of GDP over 2008-13. In Table 2b a negative number in the line for "primary deficit" amounts to a surplus.

20. This assessment of Chad's debt situation is an improvement over the one in 2006. At that time, staff judged Chad's debt outlook to be fragile and the risk of debt distress high. Prudent debt management and a more favorable balance of payments outlook account for this improvement.

21. An important risk borne out by the DSA is that a shock emanating from the external sector could well push the ratios over the threshold. But probably the most important long-term risk highlighted by the DSA is that non-oil GDP growth may stagnate at the low rate prior to the advent of the oil era. The challenge is to use oil revenues effectively to enhance the economy's productive capacity, through efficient investments in human and physical infrastructure, accompanied by structural reforms that improve governance and the business climate. If the government fails to meet this challenge, it would thwart the baseline strategy to offset decreasing oil export proceeds by increasing non-oil exports, and decreasing government oil revenue by increasing non-oil revenue.

22. As at the time of the 2006 DSA, there is a considerable risk that fiscal discipline will not prevail in the near term, possibly leading to the accumulation of new domestic arrears. Another risk is the temptation for the government to assume large debts in connection with oil ventures, possibly collateralized against future oil income and on non-concessional terms. On the other hand, Chad's debt outlook could improve if the ongoing exploration results in new significant oil or mineral discoveries. Finally, attainment of the HIPC Initiative completion point would ensure debt sustainability even under more adverse circumstances.

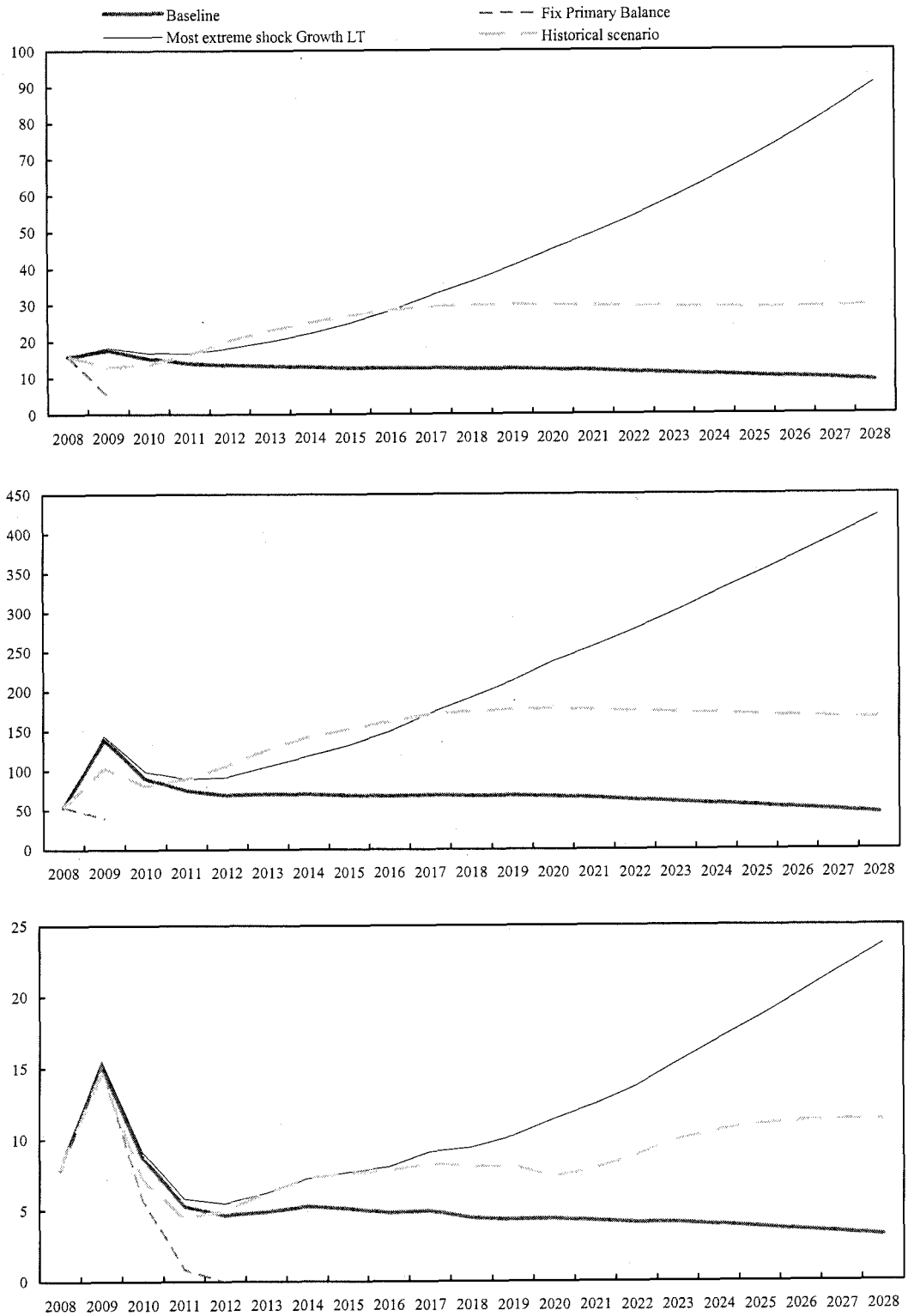
Figure 1. Chad: Indicators of Public and Publicly Guaranteed External Debt under Alternatives Scenarios, 2008-2028 1/




Source: Staff projections and simulations.

1/ The most extreme stress test is the test that yields the highest ratio in 2018. In figure b. it corresponds to a One-time depreciation shock; in c. to a Exports shock; in d. to a One-time depreciation shock; in e. to a Exports shock and in picture f. to a One-time depreciation shock

Figure 2. Chad: Indicators of Public Debt Under Alternative Scenarios, 2008-2028 1/




Sources: Country authorities; and staff estimates and projections.

1/ The most extreme stress test is the test that yields the highest ratio in 2018.

2/ Revenues are defined inclusive of grants.

Table 1a. Chad: External Debt Sustainability Framework, Baseline Scenario, 2005-2028 1/
(In percent of GDP, unless otherwise indicated)

| | Actual | | | Historical Average | Standard Deviation 6/ | Projections | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2005 | 2006 | 2007 | | | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2008-2013 Average | 2018 | 2028 | 2014-2028 Average |
| **External debt (nominal) 1/** | **30.5** | **25.9** | **22.2** | | | **20.7** | **23.6** | **20.6** | **18.6** | **17.9** | **17.6** | | **17.1** | **13.7** | |
| Of which: public and publicly guaranteed (PPG) | 30.5 | 25.9 | 22.2 | | | 20.7 | 23.6 | 20.6 | 18.6 | 17.9 | 17.6 | | 17.1 | 13.7 | |
| Change in external debt | -1.2 | -4.6 | -3.6 | | | -1.6 | 3.0 | -3.0 | -2.1 | -0.6 | -0.3 | | -0.2 | -0.3 | |
| Identified net debt-creating flows | -8.6 | -3.5 | -2.2 | | | -4.6 | 6.6 | -3.0 | -3.8 | -4.4 | 0.1 | | 2.4 | 3.1 | |
| **Non-interest current account deficit** | **-2.6** | **8.7** | **10.3** | **25.8** | **29.5** | **9.4** | **16.8** | **7.2** | **6.7** | **5.9** | **10.1** | | **10.0** | **7.9** | 9.2 |
| Deficit in balance of goods and services | -6.9 | -4.9 | -2.6 | | | -7.2 | 14.5 | 8.3 | 6.5 | 5.9 | 11.5 | | 13.8 | 12.5 | |
| Exports | 55.5 | 56.4 | 54.8 | | | 56.0 | 36.2 | 38.7 | 39.5 | 38.2 | 31.5 | | 23.5 | 17.2 | |
| Imports | 48.6 | 51.5 | 52.2 | | | 48.8 | 50.6 | 47.0 | 46.0 | 44.2 | 43.1 | | 37.4 | 29.8 | |
| Net current transfers (negative = inflow) | -5.3 | -4.4 | -4.0 | -4.2 | 0.7 | -3.2 | -5.1 | -4.5 | -4.1 | -4.3 | -4.4 | | -4.9 | -4.4 | -4.7 |
| *Of which: official* | -3.5 | -2.9 | -2.5 | | | -1.9 | -2.8 | -2.7 | -2.5 | -2.9 | -2.9 | | -3.4 | -3.6 | |
| Other current account flows (negative = net inflow) | 9.6 | 18.0 | 16.9 | | | 19.7 | 7.4 | 3.4 | 4.3 | 4.3 | 2.9 | | 1.1 | -0.3 | |
| **Net FDI (negative = inflow)** | **1.7** | **-10.4** | **-10.1** | **-14.0** | **14.9** | **-14.3** | **-9.6** | **-9.7** | **-10.0** | **-10.0** | **-9.8** | | **-7.2** | **-4.3** | -6.4 |
| **Endogenous debt dynamics 2/** | **-7.6** | **-1.7** | **-2.4** | | | **0.3** | **-0.6** | **-0.5** | **-0.5** | **-0.3** | **-0.2** | | **-0.4** | **-0.5** | |
| Contribution from nominal interest rate | 0.2 | 0.3 | 0.2 | | | 0.2 | 0.3 | 0.3 | 0.2 | 0.2 | 0.2 | | 0.2 | 0.1 | |
| Contribution from real GDP growth | -1.9 | 0.0 | 0.0 | | | 0.1 | -0.9 | -0.7 | -0.7 | -0.5 | -0.4 | | -0.6 | -0.6 | |
| Contribution from price and exchange rate changes | -6.0 | -2.0 | -2.6 | | | ... | ... | ... | ... | ... | ... | | ... | ... | |
| **Residual (3-4) 3/** | **7.4** | **-1.1** | **-1.4** | | | **3.0** | **-3.6** | **0.0** | **1.7** | **3.8** | **-0.4** | | **-2.6** | **-3.4** | |
| Of which: 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 external debt 4/ | ... | ... | 17.2 | | | 13.6 | 17.2 | 15.2 | 13.9 | 13.4 | 13.1 | | 12.3 | 8.9 | |
| In percent of exports | ... | ... | 31.5 | | | 24.2 | 47.5 | 39.3 | 35.1 | 35.0 | 41.5 | | 52.3 | 51.7 | |
| **PV of PPG external debt** | **...** | **...** | **17.2** | | | **13.6** | **17.2** | **15.2** | **13.9** | **13.4** | **13.1** | | **12.3** | **8.9** | |
| **In percent of exports** | **...** | **...** | **31.5** | | | **24.2** | **47.5** | **39.3** | **35.1** | **35.0** | **41.5** | | **52.3** | **51.7** | |
| **In percent of government revenues** | **...** | **...** | **75.7** | | | **48.8** | **150.7** | **100.9** | **82.9** | **77.9** | **80.1** | | **80.2** | **53.8** | |
| **Debt service-to-exports ratio (in percent)** | **1.8** | **2.0** | **1.5** | | | **3.1** | **3.7** | **2.8** | **2.5** | **2.4** | **2.9** | | **3.5** | **3.7** | |
| **PPG debt service-to-exports ratio (in percent)** | **1.8** | **2.0** | **1.5** | | | **3.1** | **3.7** | **2.8** | **2.5** | **2.4** | **2.9** | | **3.5** | **3.7** | |
| **PPG debt service-to-revenue ratio (in percent)** | **10.4** | **6.6** | **3.5** | | | **6.3** | **11.7** | **7.1** | **5.9** | **5.3** | **5.6** | | **5.3** | **3.8** | |
| Total gross financing need (Billions of U.S. dollars) | 0.0 | 0.0 | 0.1 | | | -0.3 | 0.6 | -0.1 | -0.2 | -0.3 | 0.1 | | 0.4 | 0.9 | |
| Non-interest current account deficit that stabilizes debt ratio | -1.4 | 13.3 | 13.9 | | | 10.9 | 13.8 | 10.1 | 8.8 | 6.5 | 10.4 | | 10.2 | 8.2 | |
| **Key macroeconomic assumptions** | | | | | | | | | | | | | | | |
| Real GDP growth (in percent) | 7.9 | 0.2 | 0.2 | 8.2 | 10.5 | -0.4 | 3.5 | 3.5 | 3.6 | 2.7 | 2.5 | 2.6 | 3.5 | 4.7 | 3.8 |
| GDP deflator in US dollar terms (change in percent) | 23.3 | 7.0 | 11.1 | 8.4 | 11.6 | 20.5 | -24.1 | 8.1 | 5.0 | 2.6 | 1.4 | 2.3 | 1.5 | 3.3 | 2.1 |
| Effective interest rate (percent) 5/ | 1.0 | 1.1 | 0.9 | 1.0 | 0.3 | 1.3 | 1.3 | 1.3 | 1.2 | 1.2 | 1.2 | 1.2 | 1.0 | 1.0 | 1.0 |
| Growth of exports of G&S (US dollar terms, in percent) | 43.8 | 8.9 | 8.0 | 45.5 | 85.7 | 22.7 | -49.2 | 19.8 | 11.0 | 2.0 | -14.2 | -1.3 | -2.4 | 6.4 | 1.8 |
| Growth of imports of G&S (US dollar terms, in percent) | 7.3 | 13.5 | 12.8 | 30.3 | 53.3 | 12.3 | -18.5 | 3.9 | 6.4 | 1.1 | 1.4 | 1.1 | 1.8 | 6.3 | 3.4 |
| Grant element of new public sector borrowing (in percent) | ... | ... | ... | ... | ... | 53.2 | 53.2 | 53.2 | 53.2 | 53.2 | 53.2 | 53.2 | 53.2 | 53.2 | 53.2 |
| Government revenues (excluding grants, in percent of GDP) | 9.4 | 16.9 | 22.8 | | | 27.8 | 11.4 | 15.1 | 16.7 | 17.2 | 16.4 | | 15.4 | 16.6 | 15.7 |
| Aid flows (in Billions of US dollars) 7/ | 0.2 | 0.1 | 0.1 | | | 0.2 | 0.1 | 0.2 | 0.2 | 0.3 | 0.3 | | 0.4 | 0.9 | |
| Of which: Grants | 0.2 | 0.1 | 0.1 | | | 0.1 | 0.1 | 0.1 | 0.2 | 0.2 | 0.2 | | 0.3 | 0.7 | |
| Of which: Concessional loans | 0.0 | 0.0 | 0.0 | | | 0.0 | 0.1 | 0.0 | 0.0 | 0.1 | 0.1 | | 0.1 | 0.3 | |
| Grant-equivalent financing (in percent of GDP) 8/ | ... | ... | ... | | | 1.8 | 1.7 | 2.1 | 2.1 | 2.8 | 2.9 | | 3.6 | 3.9 | 3.6 |
| Grant-equivalent financing (in percent of external financing) 8/ | ... | ... | ... | | | 88.2 | 81.1 | 92.7 | 92.7 | 85.5 | 85.5 | | 85.5 | 86.9 | 86.0 |
| *Memorandum items:* | | | | | | | | | | | | | | | |
| Nominal GDP (Billions of US dollars) | 5.9 | 6.3 | 7.0 | | | 8.4 | 6.6 | 7.4 | 8.1 | 8.5 | 8.8 | | 10.5 | 20.9 | |
| Nominal dollar GDP growth | 33.1 | 7.2 | 11.3 | | | 20.0 | -21.4 | 11.9 | 8.8 | 5.4 | 4.0 | 4.8 | 5.0 | 8.2 | 5.9 |
| PV of PPG external debt (in Billions of US dollars) | | | 1.2 | | | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.2 | | 1.3 | 1.9 | |
| (PVt-PVt-1)/GDPt-1 (in percent) | | | | | | -1.0 | 0.0 | -0.2 | -0.1 | 0.2 | 0.2 | -0.1 | 0.4 | 0.4 | 0.4 |

Source: Staff simulations.

1/ Includes both public and private sector external debt.
2/ Derived as [r - g - r(1+g)]/(1+g+r+gr) times previous period debt ratio, with r = nominal interest rate; g = real GDP growth rate, and r = growth rate of GDP deflator in U.S. dollar terms.
3/ Includes exceptional financing (i.e., changes in arrears and debt relief); changes in gross foreign assets; and valuation adjustments. For projections also includes contribution from price and exchange rate changes.
4/ Assumes that PV of private sector debt is equivalent to its face value.
5/ Current-year interest payments divided by previous period debt stock.
6/ Historical averages and standard deviations are generally derived over the past 10 years, subject to data availability.
7/ Defined as grants, concessional loans, and debt relief.
8/ 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, 2005-2028
(In percent of GDP, unless otherwise indicated)

| | Actual | | | | | Estimate | Projections | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2005 | 2006 | 2007 | Average | Standard Deviation 5/ | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2008-13 Average | 2018 | 2028 | 2014-28 Average |
| **Public sector debt 1/** | 33.8 | 28.8 | 24.5 | | | 21.6 | 24.1 | 20.8 | 18.7 | 18.1 | 17.7 | | 17.2 | 13.7 | |
| Of which: foreign-currency denominated | 30.5 | 25.9 | 22.2 | | | 20.7 | 23.6 | 20.6 | 18.6 | 17.9 | 17.6 | | 17.1 | 13.7 | |
| Change in public sector debt | 1.9 | -5.0 | -4.3 | | | -2.9 | 2.5 | -3.3 | -2.1 | -0.6 | -0.4 | | -0.2 | -0.3 | |
| Identified debt-creating flows | -4.3 | -6.4 | -5.3 | | | -6.5 | 11.2 | -3.0 | -4.2 | -4.3 | -2.8 | | 0.3 | -0.6 | |
| Primary deficit | -0.1 | -2.8 | -3.5 | 2.7 | 3.8 | -6.8 | 7.3 | -0.7 | -2.7 | -3.6 | -2.3 | -1.5 | 0.9 | 0.4 | 0.8 |
| Revenue and grants | 12.7 | 18.8 | 24.2 | | | 29.3 | 12.7 | 17.0 | 18.6 | 19.4 | 18.7 | | 18.2 | 19.8 | |
| *Of which: grants* | 3.4 | 1.9 | 1.5 | | | 1.5 | 1.3 | 1.9 | 1.9 | 2.3 | 2.3 | | 2.9 | 3.2 | |
| Primary (noninterest) expenditure | 12.6 | 16.0 | 20.8 | | | 22.5 | 20.0 | 16.3 | 15.9 | 15.9 | 16.4 | | 19.2 | 20.1 | |
| Automatic debt dynamics | -4.3 | -4.5 | -2.6 | | | -0.4 | 3.6 | -2.3 | -1.4 | -0.7 | -0.5 | | -0.7 | -0.9 | |
| Contribution from interest rate/growth differential | -2.9 | -0.7 | -0.4 | | | -0.3 | -0.7 | -1.0 | -0.9 | -0.7 | -0.6 | | -0.8 | -0.8 | |
| *Of which: contribution from average real interest rate* | -0.5 | -0.7 | -0.4 | | | -0.4 | 0.1 | -0.2 | -0.2 | -0.2 | -0.2 | | -0.2 | -0.1 | |
| *Of which: contribution from real GDP growth* | -2.3 | -0.1 | -0.1 | | | 0.1 | -0.7 | -0.8 | -0.7 | -0.5 | -0.4 | | -0.6 | -0.6 | |
| Contribution from real exchange rate depreciation | -1.5 | -3.8 | -2.2 | | | -0.1 | 4.2 | -1.3 | -0.5 | -0.1 | 0.1 | | ... | ... | |
| Other identified debt-creating flows | 0.1 | 0.9 | 0.7 | | | 0.7 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Privatization receipts (negative) | 0.0 | 0.0 | 0.0 | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Recognition of implicit or contingent liabilities | 0.1 | 0.9 | 0.7 | | | 0.7 | 0.4 | 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 | 6.2 | 1.4 | 1.0 | | | 3.6 | -8.8 | -0.3 | 2.1 | 3.7 | 2.4 | | -0.4 | 0.2 | |
| **Other Sustainability Indicators** | | | | | | | | | | | | | | | |
| **PV of public sector debt** | 3.3 | 2.9 | 18.4 | | | 15.9 | 17.6 | 15.3 | 14.0 | 13.5 | 13.2 | | 12.4 | 8.9 | |
| Of which: foreign-currency denominated | 0.0 | 0.0 | 16.2 | | | 15.0 | 17.2 | 15.2 | 13.8 | 13.4 | 13.1 | | 12.3 | 8.9 | |
| Of which: external | ... | ... | 16.2 | | | 15.0 | 17.2 | 15.2 | 13.8 | 13.4 | 13.1 | | 12.3 | 8.9 | |
| PV of contingent liabilities (not included in public sector debt) | ... | ... | ... | | | ... | ... | ... | ... | ... | ... | | ... | ... | |
| Gross financing need 2/ | 1.1 | -0.5 | -1.8 | | | -3.9 | 9.3 | 0.8 | -1.8 | -2.7 | -1.4 | | 1.7 | 1.0 | |
| PV of public sector debt-to-revenue and grants ratio (in percent) | 26.2 | 15.6 | 76.0 | | | 54.3 | 138.9 | 90.2 | 75.0 | 69.3 | 70.5 | | 67.9 | 45.3 | |
| PV of public sector debt-to-revenue ratio (in percent) | 35.6 | 17.3 | 80.9 | | | 57.2 | 154.5 | 101.6 | 83.5 | 78.4 | 80.6 | | 80.6 | 54.0 | |
| Of which: external 3/ | ... | ... | 71.1 | | | 53.8 | 150.4 | 100.7 | 82.7 | 77.7 | 79.9 | | 80.0 | 53.7 | |
| Debt service-to-revenue and grants ratio (in percent) 4/ | 9.0 | 6.7 | 3.8 | | | 7.9 | 15.2 | 8.7 | 5.3 | 4.7 | 4.9 | | 4.5 | 3.2 | |
| Debt service-to-revenue ratio (in percent) 4/ | 12.2 | 7.5 | 4.0 | | | 8.3 | 16.9 | 9.8 | 5.9 | 5.3 | 5.6 | | 5.3 | 3.8 | |
| Primary deficit that stabilizes the debt-to-GDP ratio | -2.0 | 2.2 | 0.9 | | | -3.9 | 4.8 | 2.6 | -0.7 | -2.9 | -2.0 | | 1.1 | 0.7 | |
| **Key macroeconomic and fiscal assumptions** | | | | | | | | | | | | | | | |
| Real GDP growth (in percent) | 7.9 | 0.2 | 0.2 | 8.4 | 11.1 | -0.4 | 3.5 | 3.5 | 3.6 | 2.7 | 2.5 | 2.6 | 3.5 | 4.7 | 3.8 |
| Average nominal interest rate on forex debt (in percent) | 1.0 | 1.1 | 0.9 | 1.0 | 0.3 | 1.3 | 1.3 | 1.3 | 1.2 | 1.2 | 1.2 | 1.2 | 1.0 | 1.0 | 1.0 |
| Average real interest rate on domestic debt (in percent) | 65.0 | -1.4 | 2.1 | 7.7 | 23.5 | -8.6 | 22.2 | ... | ... | ... | ... | 6.8 | ... | ... | ... |
| Real exchange rate depreciation (in percent, + indicates depreciation) | -5.1 | -12.8 | -8.5 | -8.6 | 8.0 | -0.5 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Inflation rate (GDP deflator, in percent) | 23.1 | 6.2 | 1.8 | 6.0 | 8.8 | 12.0 | -16.4 | 7.6 | 4.5 | 2.2 | 1.0 | 1.8 | 1.5 | 3.3 | 2.1 |
| Growth of real primary spending (deflated by GDP deflator, in percent) | 0.0 | 0.3 | 0.3 | 0.1 | 0.2 | 0.1 | -0.1 | -0.2 | 0.0 | 0.0 | 0.1 | 0.0 | 0.1 | 0.0 | 0.1 |
| Grant element of new external borrowing (in percent) | ... | ... | ... | ... | ... | 53.2 | 53.2 | 53.2 | 53.2 | 53.2 | 53.2 | 53.2 | 53.2 | 53.2 | ... |

Sources: Country authorities; and staff estimates and projections.

1/ The public sector is defined as central government and debt is on a gross basis.

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, 2008-2028
(In percent)

| | Projections | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | **2018** | 2028 |
| | | | | | | **PV of debt-to GDP ratio** | | | | | | |
| **Baseline** | 14 | 17 | 15 | 14 | 13 | 13 | 13 | 13 | 12 | 13 | **12** | 9 |
| **A. Alternative Scenarios** | | | | | | | | | | | | |
| A1. Key variables at their historical averages in 2008-2028 1/ | 14 | 12 | 16 | 20 | 24 | 25 | 27 | 27 | 28 | 28 | **28** | 24 |
| A2. New public sector loans on less favorable terms in 2008-2028 2 | 14 | 17 | 15 | 14 | 14 | 13 | 13 | 13 | 13 | 13 | **13** | 10 |
| **B. Bound Tests** | | | | | | | | | | | | |
| B1. Real GDP growth at historical average minus one standard deviation in 2009-2010 | 14 | 18 | 17 | 15 | 15 | 15 | 14 | 14 | 14 | 14 | **14** | 10 |
| B2. Export value growth at historical average minus one standard deviation in 2009-2010 3/ | 14 | 13 | 18 | 16 | 16 | 16 | 15 | 15 | 15 | 15 | **15** | 10 |
| B3. US dollar GDP deflator at historical average minus one standard deviation in 2009-2010 | 14 | 13 | 12 | 11 | 11 | 11 | 10 | 10 | 10 | 10 | **10** | 7 |
| B4. Net non-debt creating flows at historical average minus one standard deviation in 2009-2010 4/ | 14 | 21 | 23 | 21 | 21 | 21 | 20 | 20 | 20 | 20 | **20** | 12 |
| B5. Combination of B1-B4 using one-half standard deviation shocks | 14 | -4 | -19 | -19 | -19 | -19 | -19 | -20 | -20 | -21 | **-20** | -6 |
| B6. One-time 30 percent nominal depreciation relative to the baseline in 2009 5/ | 14 | 28 | 25 | 23 | 22 | 22 | 21 | 21 | 21 | 21 | **20** | 15 |
| | | | | | | **PV of debt-to-exports ratio** | | | | | | |
| **Baseline** | 24 | 48 | 39 | 35 | 35 | 42 | 40 | 42 | 44 | 49 | **52** | 52 |
| **A. Alternative Scenarios** | | | | | | | | | | | | |
| A1. Key variables at their historical averages in 2008-2028 1/ | 24 | 34 | 42 | 51 | 63 | 81 | 83 | 91 | 99 | 110 | **118** | 142 |
| A2. New public sector loans on less favorable terms in 2008-2028 2 | 24 | 48 | 40 | 35 | 35 | 42 | 41 | 43 | 46 | 51 | **54** | 56 |
| **B. Bound Tests** | | | | | | | | | | | | |
| B1. Real GDP growth at historical average minus one standard deviation in 2009-2010 | 24 | 47 | 39 | 35 | 35 | 41 | 40 | 42 | 44 | 49 | **52** | 52 |
| B2. Export value growth at historical average minus one standard deviation in 2009-2010 3/ | 24 | 29 | 71 | 63 | 63 | 76 | 74 | 77 | 81 | 91 | **97** | 90 |
| B3. US dollar GDP deflator at historical average minus one standard deviation in 2009-2010 | 24 | 47 | 39 | 35 | 35 | 41 | 40 | 42 | 44 | 49 | **52** | 52 |
| B4. Net non-debt creating flows at historical average minus one standard deviation in 2009-2010 4/ | 24 | 59 | 60 | 54 | 55 | 65 | 64 | 67 | 72 | 80 | **85** | 70 |
| B5. Combination of B1-B4 using one-half standard deviation shocks | 24 | -7 | -34 | -33 | -34 | -42 | -42 | -46 | -50 | -57 | **-61** | -23 |
| B6. One-time 30 percent nominal depreciation relative to the baseline in 2009 5/ | 24 | 47 | 39 | 35 | 35 | 41 | 40 | 42 | 44 | 49 | **52** | 52 |
| | | | | | | **PV of debt-to-revenue ratio** | | | | | | |
| **Baseline** | 49 | 151 | 101 | 83 | 78 | 80 | 80 | 79 | 79 | 81 | **80** | 54 |
| **A. Alternative Scenarios** | | | | | | | | | | | | |
| A1. Key variables at their historical averages in 2008-2028 1/ | 49 | 107 | 107 | 119 | 140 | 155 | 166 | 171 | 175 | 180 | **181** | 148 |
| A2. New public sector loans on less favorable terms in 2008-2028 2 | 49 | 151 | 101 | 83 | 79 | 81 | 82 | 81 | 81 | 83 | **83** | 58 |
| **B. Bound Tests** | | | | | | | | | | | | |
| B1. Real GDP growth at historical average minus one standard deviation in 2009-2010 | 49 | 159 | 112 | 92 | 87 | 89 | 89 | 88 | 87 | 90 | **89** | 60 |
| B2. Export value growth at historical average minus one standard deviation in 2009-2010 3/ | 49 | 114 | 118 | 98 | 92 | 95 | 96 | 94 | 94 | 97 | **97** | 61 |
| B3. US dollar GDP deflator at historical average minus one standard deviation in 2009-2010 | 49 | 113 | 81 | 67 | 63 | 64 | 65 | 63 | 63 | 65 | **64** | 43 |
| B4. Net non-debt creating flows at historical average minus one standard deviation in 2009-2010 4/ | 49 | 188 | 154 | 128 | 122 | 126 | 128 | 127 | 127 | 132 | **131** | 73 |
| B5. Combination of B1-B4 using one-half standard deviation shocks | 49 | -34 | -126 | -112 | -109 | -116 | -121 | -123 | -126 | -133 | **-133** | -34 |
| B6. One-time 30 percent nominal depreciation relative to the baseline in 2009 5/ | 49 | 249 | 167 | 137 | 129 | 132 | 133 | 130 | 130 | 134 | **132** | 89 |

Table 2a. Chad: Sensitivity Analysis for Key Indicators of Public and Publicly Guaranteed External Debt, 2008-2028 (continued)
(In percent)

| | Projections | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2028 |
| | **Debt service-to-exports ratio** | | | | | | | | | | | |
| **Baseline** | 3 | 4 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 4 | **3** | 4 |
| **A. Alternative Scenarios** | | | | | | | | | | | | |
| A1. Key variables at their historical averages in 2008-2028 1/ | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | **2** | 4 |
| A2. New public sector loans on less favorable terms in 2008-2028 2 | 3 | 4 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 4 | **4** | 4 |
| **B. Bound Tests** | | | | | | | | | | | | |
| B1. Real GDP growth at historical average minus one standard deviation in 2009-2010 | 3 | 4 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 4 | **3** | 4 |
| B2. Export value growth at historical average minus one standard deviation in 2009-2010 3/ | 3 | 3 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 6 | **6** | 7 |
| B3. US dollar GDP deflator at historical average minus one standard deviation in 2009-2010 | 3 | 4 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 4 | **3** | 4 |
| B4. Net non-debt creating flows at historical average minus one standard deviation in 2009-2010 4/ | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | **4** | 5 |
| B5. Combination of B1-B4 using one-half standard deviation shocks | 3 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | **0** | -3 |
| B6. One-time 30 percent nominal depreciation relative to the baseline in 2009 5/ | 3 | 4 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 4 | **3** | 4 |
| | **Debt service-to-revenue ratio** | | | | | | | | | | | |
| **Baseline** | 6 | 12 | 7 | 6 | 5 | 6 | 6 | 6 | 6 | 6 | **5** | 4 |
| **A. Alternative Scenarios** | | | | | | | | | | | | |
| A1. Key variables at their historical averages in 2008-2028 1/ | 6 | 8 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | **3** | 4 |
| A2. New public sector loans on less favorable terms in 2008-2028 2 | 6 | 12 | 7 | 6 | 5 | 6 | 6 | 6 | 6 | 7 | **6** | 4 |
| **B. Bound Tests** | | | | | | | | | | | | |
| B1. Real GDP growth at historical average minus one standard deviation in 2009-2010 | 6 | 12 | 8 | 7 | 6 | 6 | 7 | 7 | 6 | 6 | **6** | 4 |
| B2. Export value growth at historical average minus one standard deviation in 2009-2010 3/ | 6 | 12 | 7 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | **6** | 4 |
| B3. US dollar GDP deflator at historical average minus one standard deviation in 2009-2010 | 6 | 9 | 6 | 5 | 4 | 4 | 5 | 5 | 5 | 5 | **4** | 3 |
| B4. Net non-debt creating flows at historical average minus one standard deviation in 2009-2010 4/ | 6 | 12 | 8 | 7 | 6 | 6 | 7 | 7 | 6 | 7 | **6** | 6 |
| B5. Combination of B1-B4 using one-half standard deviation shocks | 6 | 8 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | **1** | -4 |
| B6. One-time 30 percent nominal depreciation relative to the baseline in 2009 5/ | 6 | 19 | 12 | 10 | 9 | 9 | 10 | 10 | 9 | 10 | **9** | 6 |
| *Memorandum item:* | | | | | | | | | | | | |
| Grant element assumed on residual financing (i.e., financing required above baseline) 6/ | 52 | 52 | 52 | 52 | 52 | 52 | 52 | 52 | 52 | 52 | **52** | 52 |

Source: Staff projections and simulations.

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 2008-2028

| | Projections | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2018 | 2028 |
| | PV of Debt-to-GDP Ratio | | | | | | | |
| **Baseline** | 16 | 18 | 15 | 14 | 13 | 13 | 12 | 9 |
| **A. Alternative scenarios** | | | | | | | | |
| A1. Real GDP growth and primary balance are at historical averages | 16 | 13 | 14 | 16 | 20 | 23 | 30 | 30 |
| A2. Primary balance is unchanged from 2008 | 16 | 5 | -2 | -6 | -9 | -14 | -45 | -98 |
| A3. Permanently lower GDP growth 1/ | 16 | 18 | 17 | 17 | 18 | 20 | 36 | 91 |
| **B. Bound tests** | | | | | | | | |
| B1. Real GDP growth is at historical average minus one standard deviations in 2009-2010 | 16 | 19 | 19 | 20 | 21 | 23 | 31 | 38 |
| B2. Primary balance is at historical average minus one standard deviations in 2009-2010 | 16 | 17 | 21 | 20 | 19 | 19 | 18 | 13 |
| B3. Combination of B1-B2 using one half standard deviation shocks | 16 | 15 | 18 | 17 | 16 | 16 | 16 | 13 |
| B4. One-time 30 percent real depreciation in 2009 | 16 | 25 | 22 | 21 | 20 | 19 | 18 | 12 |
| B5. 10 percent of GDP increase in other debt-creating flows in 2009 | 16 | 27 | 24 | 22 | 21 | 21 | 21 | 15 |
| | **PV of Debt-to-Revenue Ratio 2/** | | | | | | | |
| **Baseline** | 54 | 139 | 90 | 75 | 69 | 71 | 68 | 45 |
| **A. Alternative scenarios** | | | | | | | | |
| A1. Real GDP growth and primary balance are at historical averages | 54 | 103 | 81 | 89 | 106 | 126 | 174 | 165 |
| A2. Primary balance is unchanged from 2008 | 54 | 40 | -11 | -33 | -48 | -74 | -248 | -495 |
| A3. Permanently lower GDP growth 1/ | 54 | 144 | 99 | 90 | 92 | 105 | 191 | 422 |
| **B. Bound tests** | | | | | | | | |
| B1. Real GDP growth is at historical average minus one standard deviations in 2009-2010 | 54 | 151 | 113 | 105 | 107 | 119 | 166 | 188 |
| B2. Primary balance is at historical average minus one standard deviations in 2009-2010 | 54 | 134 | 125 | 105 | 98 | 101 | 100 | 67 |
| B3. Combination of B1-B2 using one half standard deviation shocks | 54 | 120 | 106 | 90 | 84 | 87 | 90 | 67 |
| B4. One-time 30 percent real depreciation in 2009 | 54 | 199 | 131 | 111 | 102 | 103 | 98 | 62 |
| B5. 10 percent of GDP increase in other debt-creating flows in 2009 | 54 | 210 | 140 | 118 | 110 | 113 | 114 | 77 |
| | **Debt Service-to-Revenue Ratio 2/** | | | | | | | |
| **Baseline** | 8 | 15 | 9 | 5 | 5 | 5 | 4 | 3 |
| **A. Alternative scenarios** | | | | | | | | |
| A1. Real GDP growth and primary balance are at historical averages | 8 | 15 | 7 | 4 | 5 | 6 | 8 | 11 |
| A2. Primary balance is unchanged from 2008 | 8 | 15 | 6 | 1 | 0 | -1 | -8 | -32 |
| A3. Permanently lower GDP growth 1/ | 8 | 16 | 9 | 6 | 5 | 6 | 9 | 24 |
| **B. Bound tests** | | | | | | | | |
| B1. Real GDP growth is at historical average minus one standard deviations in 2009-2010 | 8 | 16 | 10 | 6 | 6 | 7 | 8 | 13 |
| B2. Primary balance is at historical average minus one standard deviations in 2009-2010 | 8 | 15 | 9 | 7 | 6 | 6 | 6 | 6 |
| B3. Combination of B1-B2 using one half standard deviation shocks | 8 | 15 | 8 | 6 | 6 | 6 | 5 | 5 |
| B4. One-time 30 percent real depreciation in 2009 | 8 | 17 | 12 | 8 | 7 | 7 | 7 | 6 |
| B5. 10 percent of GDP increase in other debt-creating flows in 2009 | 8 | 15 | 11 | 8 | 6 | 7 | 6 | 7 |

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.