INTERNATIONAL MONETARY FUND

SUDAN

July 25, 2016

STAFF REPORT FOR THE 2016 ARTICLE IV CONSULTATION—DEBT SUSTAINABILITY ANALYSIS

Approved By
Daniela Gressani and Catherine Pattillo (IMF) and John Panzer (IDA)

Prepared by the staffs of the International Monetary Fund (IMF) and the International Development Association

This debt sustainability analysis (DSA) confirms that Sudan continues to be in debt distress.[1] *Both public and external debt ratios remain high, and most of the external debt is in arrears. Consistent with the results of past DSAs, Sudan's external debt is assessed to be unsustainable. All external debt indicators breach their indicative thresholds under the baseline scenario, and many of them stay above the thresholds throughout the time horizon of the analysis. It is therefore critical for Sudan to follow sound economic policies, including a prudent borrowing strategy that minimizes non-concessional borrowing and relies instead on grants and concessional financing, and to continue garnering support for debt relief.*

[1] This DSA was prepared jointly by IMF and World Bank staff under the joint Fund-Bank Low-Income Country (LIC) Debt Sustainability Framework (DSF). Sudan's Country Policy and Institutional Assessment (CPIA) Rating averaged 2.37 for 2013-14 and falls under the weak performer category. Sudan's fiscal year runs from January 1 to December 31.

BACKGROUND AND RECENT DEVELOPMENTS

1. **The economy of Sudan has yet to adjust fully to the secession of South Sudan in 2011, which took away the bulk of its oil exports and fiscal revenues.** In addition, a heavy debt burden, U.S. sanctions, and volatile domestic and regional political environments continue to weigh on economic performance. Although a series of stabilization and reform measures helped the economic adjustment, large imbalances persist.

2. **Economic performance in 2015 was mixed**. Good harvests boosted economic growth to close to 5 percent, and inflation dropped from 26 percent in December 2014 to 13 percent in December 2015. However, limited progress with raising domestic revenue to replace shortfalls in oil-related revenues weakened public finances. The external current account deficit widened and international reserves remained low. As the official exchange rate was kept virtually unchanged, the parallel exchange rate premium soared above 80 percent in December 2015 and to 125 percent at end-June 2016. The outlook is mixed with risks to the downside.

3. **Prospects for debt relief.** Debt relief prospects are predicated on obtaining assurances of support from creditors, normalizing relations with international financial institutions, and establishing a track record of cooperation with the IMF on policies and payments. In 2014, the Sudanese authorities agreed with South Sudan to extend the deadline for the "zero-option" until October 2016.[2] They also agreed to continue to reach out to creditors to garner support for debt relief.

STRUCTURE OF DEBT

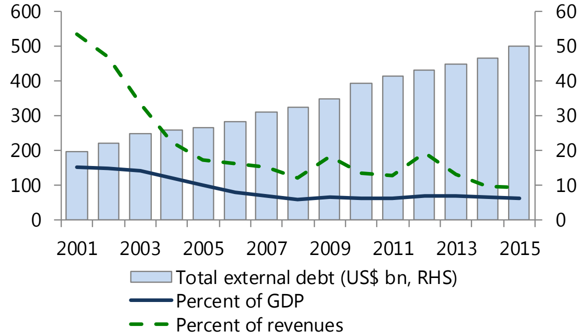
4. **Sudan's external debt remained high as of end-2015.**[3] In nominal terms, it amounted to about $50 billion (61 percent of GDP) including an estimated $1.6 billion deposited in the Central Bank of Sudan by official creditors in 2015.[4] About 84 percent of the external debt was in arrears in 2015. The structure of external debt has not changed over the last decade. The bulk is public and publicly guaranteed (PPG) debt ($48.2 billion, of which 86 percent in arrears), mainly owed to bilateral creditors and roughly equally divided between Paris Club and non-Paris Club creditors (Figures 1 and 2). Only a small fraction is private debt owed to suppliers ($1.7 billion).

[2] The so-called "zero-option" is a 2012 agreement between Sudan and South Sudan whereby Sudan retains all the external liabilities after the secession of South Sudan, provided that the international community gives firm commitments of delivery of debt relief within two years. Absent such commitment, Sudan's external debt would be apportioned with South Sudan based on a formula to be determined. This deadline lapsed in September 2014, but the parties agreed to extend it for two years.

[3] Debt data were provided by the Sudanese authorities, complemented by information obtained during the 2011 external debt reconciliation exercise, as well as Fund and World Bank staffs' estimates.

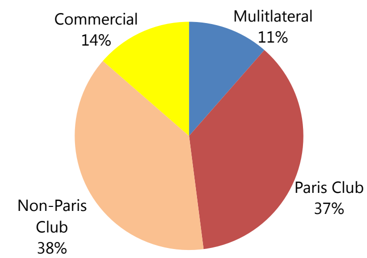
[4] The drop in debt-to-GDP ratios in 2014–15 was partly due to high inflation and nominal GDP growth while the official exchange rate remained stable. With GDP converted at the parallel rate, the debt-to-GDP ratio would reach 99.5 percent in 2015.

Figure 1. Stock of External Debt, 2001–15



Sources: Sudanese authorities, World Bank, and IMF staff estimates.

Figure 2. Structure of 2015 PPG External Debt



Sources: Sudanese authorities, World Bank, and IMF staff estimates

Stock of External Debt

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Total external debt (US$ million)	19,810	22,137	24,918	25,861	26,612	28,216	31,052	32,561	34,866	39,486	41,450	43,191	45,022	46,781	49,970
Percent of GDP	150	150	141	121	100	79	68	60	66	60	62	69	69	66	61
Percent of exports	1,320	1,070	952	679	523	413	309	248	411	305	350	688	696	724	932
Percent of revenues	535	470	336	225	174	162	153	119	184	135	128	194	131	95	92

Sources: Sudanese authorities; and IMF staff estimates.

Structure of Public and Publicly Guaranteed Debt

	2010		2015	
	(In US$ million)	(In percent)	(In US$ million)	(In percent)
Total PPG	**37,927**	**100.0**	**48,285**	**100.0**
Mulitlateral	**5,200**	**13.7**	**5,528**	**11.4**
Bilateral	**27,754**	**73.2**	**36,193**	**75.0**
Paris Club	13,964	36.8	17,633	36.5
Non-Paris Club	13,790	36.4	18,560	38.4
Commercial	**4,974**	**13.1**	**6,564**	**13.6**

Sources: Sudanese authorities; and IMF staff estimates.

5. **External public borrowing has been limited in recent years.** Sudan has been largely cut off from access to external financing due to its arrears with the creditors. It has been only able to contract new

debt—below 1 percent of GDP per year in 2012–15—with a limited number of multilateral and non-Paris Club bilateral creditors. The newly contracted debt has been mainly used to finance projects in the agriculture, services and energy sectors. In 2015, $262 million of new debt (0.3 percent of GDP) was contracted, including $166 million from a multilateral creditor and $96 million from bilateral creditors. There has not been any new private external debt in decades. In addition, official creditors deposited an estimated $1.6 billion in the Central Bank of Sudan in 2015 and $0.5 billion in the first quarter of 2016 (these amounts were added to outstanding debt). So far in 2016, only one bilateral loan was contracted to finance projects in water harvesting.

New External Debt Contracted (2012-16)

	2012	2013	2014	2015	2016Q1
Total new debt (in US$ million)	**431**	**618**	**152**	**262**	**120**
In percent of GDP	**0.7**	**0.9**	**0.2**	**0.3**	**0.1**
Of which:					
Concessional	134	16	5	6	-
Nonconcessional	296	602	147	256	120
By creditor (in percent)					
Multilateral	79	48	65	63	-
Non-Paris Club bilateral	21	52	35	37	100
Average grant element (in percent)	**30**	**28**	**27**	**22**	**27**
By sector (in percent)	**100**	**100**	**100**	**100**	**100**
Agriculture	32	38	-	2	-
Energy	7	47	33	-	-
Services	61	-	36	34	100
Industrial Development	-	6	31	-	-
Other	-	10	-	63	-

Sources: Sudanese authorities; and IMF staff calculations.

6. **Sudan's total public debt reached 72.9 percent of GDP by end-2015**. The bulk of the public debt is external debt. Domestic debt reached 13 percent of GDP by end-2015. Domestic debt has been on the rise due to increased domestic financing of the budget, albeit to a still relatively low level.

DEBT SUSTAINABILITY ANALYSIS

A. Underlying Assumptions

7. **The macroeconomic assumptions underlying this DSA have been updated based on developments in 2014–15.** The differences compared to the 2014 DSA are driven by higher growth and lower inflation outturns in 2014–15 relative to previous projections, and by the revised policy and international environment outlook detailed in Box 1. As in previous DSAs, this update does not include

arrears clearance, possible external debt relief, or debt apportionment between Sudan and South Sudan in its baseline or alternative scenarios.

Box 1. Sudan: Macroeconomic Assumptions 2016–36

Natural resources. The outlook is informed by discussions with the Sudanese authorities. Oil production is projected at 101 thousand barrels/day in 2016, somewhat below 2015 production level. Ageing oil fields and a low international oil price outlook combine for only moderate expansion of further exploration and production to 108 thousand barrels/day in 2021. Meanwhile, non-oil GDP is projected to grow by about 3.6 percent per year by 2021 and remain stable afterwards. Price projections are guided by the IMF's latest World Economic Outlook (WEO). The price of Sudan's crude oil is projected to average US$47/barrel in the medium term.

Real sector. The real GDP growth rate is expected to stabilize at 3.5 percent through 2021 and remain unchanged over 2022–36. Medium-term real GDP growth mainly reflects strengthening of non-oil sectors (mainly agriculture and mining), macroeconomic stabilization, and reforms of the business environment.[1] Inflation, as measured by the GDP deflator, is projected to be moderate in the near to long term averaging 12.6 percent in 2016–36.

Fiscal sector. The fiscal deficit is projected to stabilize over the medium term, reflecting a combination of gradual improvements in tax revenue collection, stable oil revenues, and containment of current spending, including a gradual phasing out of fuel subsidies and recent unification of the wheat exchange rate with the official exchange rate which lowered wheat subsidies. Over the long run, the fiscal accounts are expected to continue to improve owing to (i) gradual increases in tax revenues, against the backdrop of stable oil revenues and (ii) moderate increases in capital spending. Under those assumptions, the domestic debt-to-GDP ratio is projected to be sustainable.

External sector. The current account deficit is expected to improve slightly over the medium term, to below 4 percent of GDP by end-2021, reflecting a stabilizing fiscal deficit as well as slight growth in oil and strengthening non-oil exports. In the long run, it is projected to decline to about 2 percent of GDP as oil exports stabilize while non-oil exports continue to gain ground. The deficit will be financed by foreign direct investment and continued accumulation of external debt arrears. Sizable financing gap are assumed to be covered by external debt throughout the projection period.

External debt. Reflecting continued limited access to international finance and a deteriorating debt service capacity, disbursements of new loans are expected to be limited, at about 0.3 percent of GDP during 2016-36. In line with the recent portfolio of new contracted debt, the share of new concessional loans is assumed at around one-third. It is assumed that Sudan will continue not to service obligations arising from the stock of arrears, but will service in full in 2022 obligations associated with the deposits at the central bank referred to in paragraph 5. In addition, the projected financing gaps are added to the external debt stock.

1/ For more information on sources of growth in Sudan, see IMF Country Report No. 14/364, Annex II.

B. External Debt Sustainability

8. **Sudan's external debt stock remains unsustainable under the baseline scenario** (Figure 1 and Table 1). All PPG external debt level ratios continue to breach their indicative thresholds throughout the

20-year projection period. The present value (PV) of PPG external debt is at about 93 percent of GDP at end-2015—three times of the 30 percent threshold for weak policy performers—and is projected to stay above the threshold through the projection period.[5] Similarly, in 2015, the PV of debt-to-exports is above 1400 percent and the PV of debt-to-revenue ratio is about 872 percent, well above their respective thresholds. Although these ratios are projected to improve based on the macroeconomic assumptions and limited external borrowing over the medium to long run, such improvements are insufficient to bring debt to sustainable levels.

9. **In addition, Sudan's debt outlook is vulnerable to a range of shocks** (Figure 1 and Table 2). The PV of debt-to-GDP, debt-to-revenue and debt service-to-revenue ratios are most vulnerable to a one-time depreciation shock, whereas the PV of debt-to-exports and debt service-to-exports ratios are most vulnerable to an export shock. A standard one-time 30 percent depreciation shock in 2017 would increase the PV-of-debt to 96 percent of GDP in that year and then bring it below its 2017 baseline value only in 2020.[6]

C. Public Debt Sustainability

10. **Public DSA results mirror those of the external DSA** (Figure 2 and Table 3). The debt ratios, albeit declining remain at relatively high levels in the long term. The PV of public debt-to-GDP ratio is projected to stay above the indicative benchmark throughout the projection period. Similar to the external DSA, the public DSA bound tests show that public debt path is most vulnerable to a one-time 30 percent real depreciation (Table A4).

CONCLUSIONS

11. **Sudan remains in debt distress.** The results of this DSA are broadly unchanged from those in previous DSAs, as no debt relief was granted to Sudan in the meantime. External debt remains unsustainable. In addition, the debt burden increases over time as the amounts needed to close projected financing gaps are added to the outstanding debt stocks. In nominal terms, in 2026 the debt stock is 2.5 times the amount in 2015. In the long term, all public and public-guaranteed external debt burden ratios remain well above their respective indicative thresholds. Public debt is also unsustainable, driven mostly by external debt dynamics.

12. **Debt relief—along with sound policies—is necessary to bring debt back on a sustainable path and regain access to external financing.** Sudan needs to: (i) step up outreach efforts to its creditors to garner broad support for debt relief; (ii) continue to cooperate with the IMF on economic policies and payments with a view to establishing a track record of sound macro policies; and (iii) minimize new borrowing on non-concessional terms, since it further increases the future debt burden, and instead secure

[5] Ratios in terms of GDP are calculated using the official exchange rate, which is overvalued in real and nominal terms. The parallel exchange rate premium was about 125 percent as of end-June 2016. If the parallel rate was used to calculate GDP, debt-to-GDP ratios would be correspondingly higher than the ones reported.

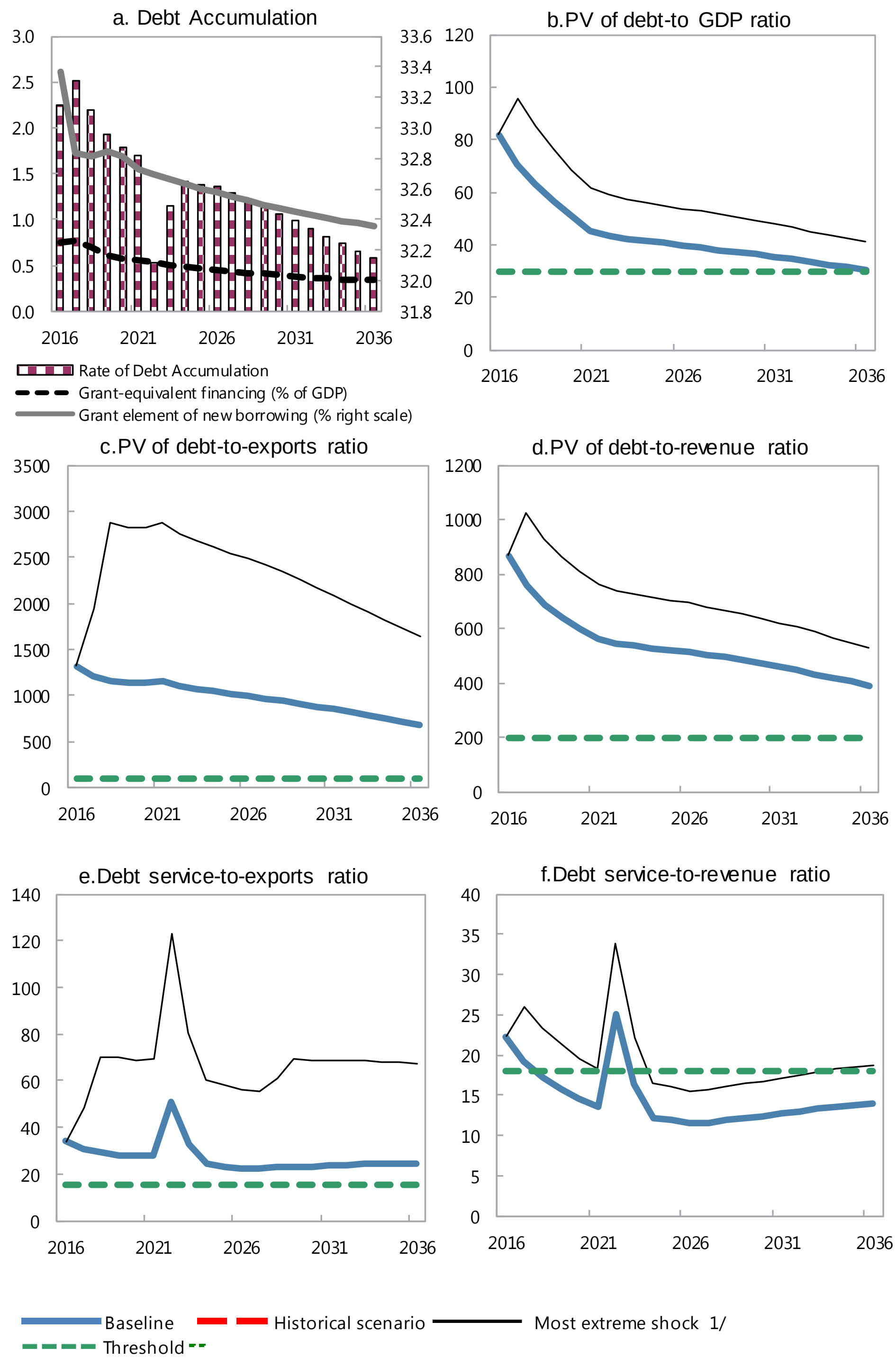
[6] The peaks in debt service in 2022 in Figure 1 are due to estimated bullet repayments of central bank deposits.

foreign support on highly concessional terms to finance necessary development and infrastructure expenditures.

13. **The authorities generally agree with the results and assessments of the DSA**. They agree that external debt is at unsustainable levels, debt service burdens are beyond Sudan's debt servicing capacity, and as a result Sudan continues to accumulate external debt arrears. They agree that non-concessional borrowing is costly and therefore should be minimized. They reiterate that debt relief is urgently needed for economic development, and remain hopeful that the international community will provide debt relief in the near future. In this regard, the authorities are committed to continue reaching out to creditors.

14. **The authorities are developing a national debt strategy.** In February 2016, they held a donor-sponsored workshop to formulate a national debt policy. The workshop included a high-level seminar exploring the experience of Ethiopia in receiving HIPC and MDRI debt relief and was followed by a trip to Addis Ababa. The resulting national debt strategy is awaiting approval by the government. Given uncertain prospects for debt relief, the strategy focuses on domestic debt markets to finance development projects. The authorities consider that technical assistance on external debt management, external debt statistics, macroeconomic policies, and financial programming would be helpful to advance their debt strategy.

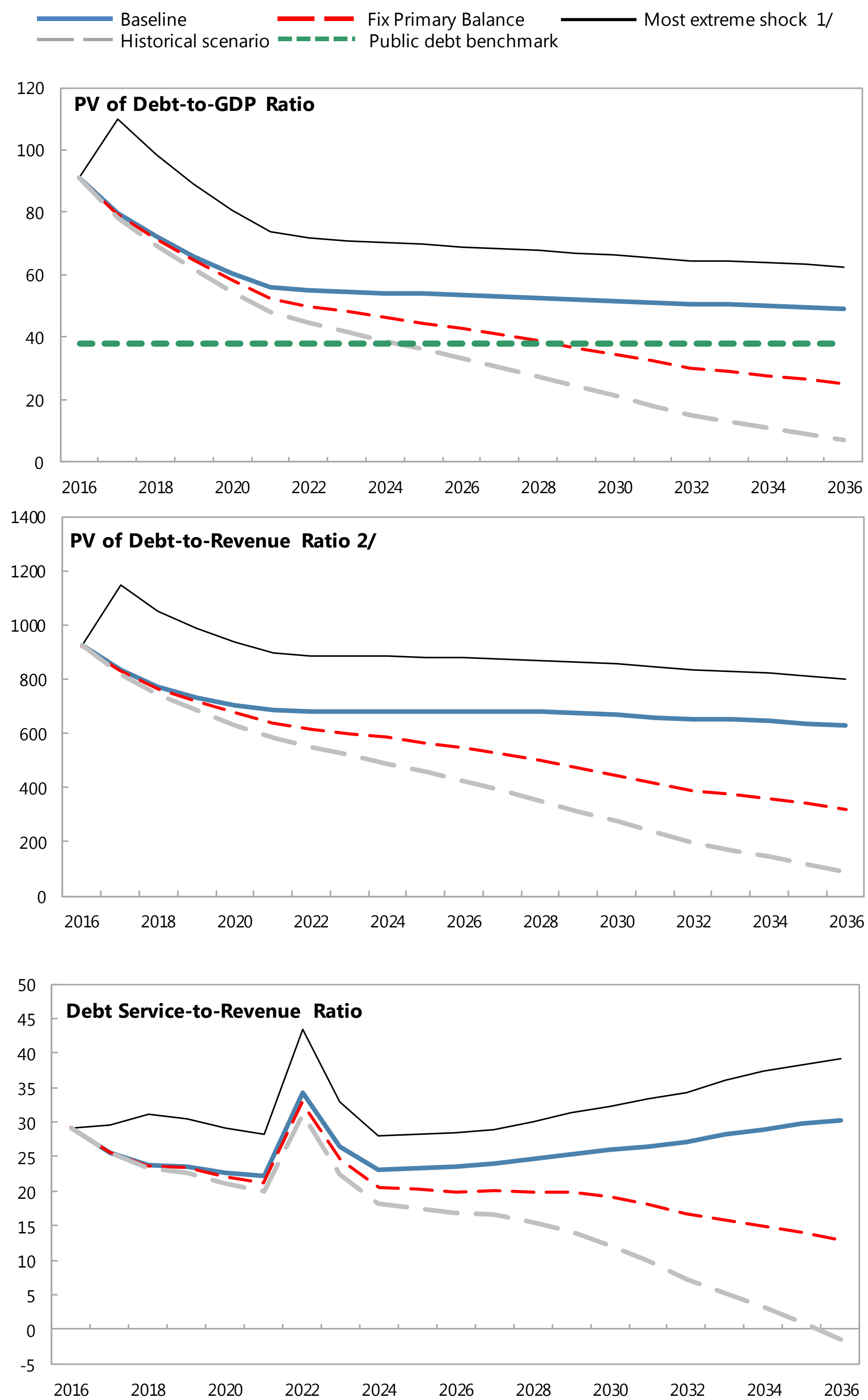
Figure 1. Sudan: Indicators of Public and Publicly Guaranteed External Debt Under Alternatives Scenarios, 2016–36 1/



Sources: Country authorities; and staff estimates and projections.

1/ The most extreme stress test is the test that yields the highest ratio on or before 2026. 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 figure f. to a One-time depreciation shock

Figure 2. Sudan: Indicators of Public Debt Under Alternative Scenarios, 2016–36[1/]



Sources: Country authorities; and staff estimates and projections.
1/ The most extreme stress test is the test that yields the highest ratio on or before 2026.
2/ Revenues are defined inclusive of grants.

Table 1. Sudan: External Debt Sustainability Framework, Baseline Scenario, 2013–36[1/]

(In percent of GDP, unless otherwise indicated)

	Actual			Historical 6/ Average	Standard 6/ Deviation	Projections									
	2013	2014	2015			2016	2017	2018	2019	2020	2021	2016-2021 Average	2026	2036	2022-2036 Average
External debt (nominal) 1/	**81.8**	**68.4**	**61.9**			**55.4**	**49.1**	**44.8**	**41.1**	**37.5**	**34.5**		**33.3**	**28.7**	
of which: public and publicly guaranteed (PPG)	79.3	66.1	59.9			53.5	47.5	43.4	39.8	36.4	33.5		32.5	28.0	
Change in external debt	-2.9	-13.4	-6.5			-6.6	-6.3	-4.3	-3.8	-3.6	-3.0		-0.1	-0.7	
Identified net debt-creating flows	2.6	-1.1	-3.0			2.1	1.4	1.4	1.2	1.1	1.2		0.4	-1.3	
Non-interest current account deficit	**6.1**	**4.7**	**5.8**	**3.3**	**3.4**	**4.1**	**3.5**	**3.3**	**2.9**	**2.7**	**2.7**		**2.0**	**0.6**	1.6
Deficit in balance of goods and services	6.5	5.3	5.9			4.3	3.6	3.4	3.1	2.9	2.9		2.1	0.6	
Exports	9.9	9.1	6.6			6.2	5.9	5.4	4.9	4.4	3.9		4.0	4.4	
Imports	16.4	14.3	12.5			10.5	9.4	8.8	8.0	7.3	6.8		6.1	5.1	
Net current transfers (negative = inflow)	-2.3	-1.6	-0.8	-2.0	1.2	-0.8	-0.7	-0.6	-0.6	-0.5	-0.5		-0.4	-0.3	-0.4
of which: official	-0.9	-0.9	-0.4			-0.4	-0.4	-0.3	-0.3	-0.3	-0.3		-0.2	-0.1	
Other current account flows (negative = net inflow)	1.8	1.0	0.7			0.6	0.6	0.5	0.5	0.4	0.4		0.3	0.3	
Net FDI (negative = inflow)	**-2.9**	**-2.2**	**-2.3**	**-4.6**	**2.3**	**-2.3**	**-2.0**	**-1.8**	**-1.6**	**-1.4**	**-1.3**		**-1.3**	**-1.5**	-1.4
Endogenous debt dynamics 2/	**-0.5**	**-3.6**	**-6.5**			**0.2**	**-0.1**	**-0.1**	**-0.2**	**-0.2**	**-0.2**		**-0.3**	**-0.4**	
Contribution from nominal interest rate	3.2	2.8	2.2			1.8	1.5	1.3	1.2	1.1	0.9		0.8	0.6	
Contribution from real GDP growth	-4.3	-1.2	-2.9			-1.6	-1.6	-1.5	-1.4	-1.2	-1.1		-1.1	-1.0	
Contribution from price and exchange rate changes	0.6	-5.2	-5.8			...	...	...	...	...	...		...	...	
Residual (3-4) 3/	**-5.5**	**-12.3**	**-3.4**			**-8.6**	**-7.7**	**-5.6**	**-4.9**	**-4.7**	**-4.2**		**-0.5**	**0.6**	
of which: exceptional financing	-2.9	-2.7	-2.1			-1.9	-1.6	-1.4	-1.2	-1.1	-0.9		-0.7	-0.4	
PV of external debt 4/	...	...	95.2			83.6	72.2	64.4	57.7	51.5	46.3		40.6	31.1	
In percent of exports	...	...	1445.9			1351.3	1230.5	1188.1	1165.6	1161.6	1183.4		1016.3	699.4	
PV of PPG external debt	**...**	**...**	**93.2**			**81.7**	**70.7**	**63.0**	**56.5**	**50.5**	**45.4**		**39.7**	**30.4**	
In percent of exports	**...**	**...**	**1414.5**			**1321.8**	**1204.0**	**1162.8**	**1141.0**	**1137.2**	**1158.8**		**995.3**	**683.6**	
In percent of government revenues	**...**	**...**	**871.9**			**868.2**	**757.9**	**686.7**	**640.2**	**597.1**	**562.8**		**511.6**	**389.9**	
Debt service-to-exports ratio (in percent)	**32.1**	**32.5**	**38.2**			**34.5**	**31.1**	**29.7**	**28.7**	**28.0**	**28.3**		**22.9**	**24.9**	
PPG debt service-to-exports ratio (in percent)	**31.7**	**32.1**	**37.7**			**34.0**	**30.6**	**29.2**	**28.1**	**27.5**	**27.7**		**22.4**	**24.3**	
PPG debt service-to-revenue ratio (in percent)	**30.3**	**25.6**	**23.2**			**22.3**	**19.2**	**17.3**	**15.8**	**14.4**	**13.5**		**11.5**	**13.9**	
Total gross financing need (Billions of U.S. dollars)	4.1	3.8	4.9			3.8	3.8	4.0	4.1	4.4	5.0		4.2	1.0	
Non-interest current account deficit that stabilizes debt ratio	8.9	18.0	12.3			10.7	9.8	7.5	6.7	6.3	5.7		2.1	1.3	
Key macroeconomic assumptions															
Real GDP growth (in percent)	5.3	1.6	4.9	3.5	3.2	3.0	3.5	3.5	3.5	3.5	3.5	3.4	3.4	3.5	3.5
GDP deflator in US dollar terms (change in percent)	-0.7	6.8	9.3	8.6	10.9	12.2	15.2	11.7	11.1	11.6	11.1	12.1	2.0	1.8	1.9
Effective interest rate (percent) 5/	3.9	3.8	3.6	4.6	0.7	3.4	3.3	3.2	3.1	3.0	2.9	3.1	2.5	2.1	2.5
Growth of exports of G&S (US dollar terms, in percent)	3.0	-0.2	-16.9	6.0	34.3	8.6	13.2	6.8	5.0	3.5	1.5	6.4	6.1	7.0	6.3
Growth of imports of G&S (US dollar terms, in percent)	1.8	-5.3	-0.4	3.4	9.5	-2.8	7.5	7.5	5.0	5.6	6.3	4.8	3.4	3.5	3.5
Grant element of new public sector borrowing (in percent)	...	...	...	...	...	33.4	32.8	32.8	32.9	32.8	32.7	32.9	32.6	32.4	32.5
Government revenues (excluding grants, in percent of GDP)	10.4	11.4	10.7			9.4	9.3	9.2	8.8	8.5	8.1		7.8	7.8	7.8
Aid flows (in Billions of US dollars) 7/	0.4	0.4	0.3			0.5	0.4	0.4	0.4	0.4	0.5		0.4	0.3	
of which: Grants	0.4	0.4	0.3			0.4	0.3	0.3	0.3	0.3	0.3		0.2	0.2	
of which: Concessional loans	0.0	0.0	0.0			0.1	0.1	0.1	0.2	0.2	0.2		0.2	0.1	
Grant-equivalent financing (in percent of GDP) 8/	...	...	...			0.8	0.8	0.7	0.6	0.6	0.6		0.5	0.3	0.4
Grant-equivalent financing (in percent of external financing) 8/	...	...	...			54.3	42.5	41.8	41.8	40.9	39.7		37.4	35.0	36.6
Memorandum items:															
Nominal GDP (Billions of US dollars)	65.5	71.1	81.4			94.1	112.2	129.8	149.3	172.4	198.2		259.2	439.2	
Nominal dollar GDP growth	4.6	8.5	14.6			15.6	19.2	15.7	15.0	15.5	14.9	16.0	5.5	5.3	5.5
PV of PPG external debt (in Billions of US dollars)			75.1			77.0	79.3	81.8	84.3	87.0	89.9		103.1	133.3	
(PVt-PVt-1)/GDPt-1 (in percent)						2.3	2.5	2.2	1.9	1.8	1.7	2.1	1.4	0.6	1.0
Gross workers' remittances (Billions of US dollars)	1.4	0.9	0.7			0.7	0.7	0.8	0.8	0.9	0.9		1.0	1.2	
PV of PPG external debt (in percent of GDP + remittances)	...	...	92.4			81.2	70.2	62.7	56.2	50.2	45.2		39.6	30.3	
PV of PPG external debt (in percent of exports + remittances)	...	...	1261.2			1182.8	1085.6	1050.1	1025.7	1020.9	1036.6		906.6	642.8	
Debt service of PPG external debt (in percent of exports + remittances)	...	...	33.6			30.4	27.6	26.4	25.3	24.7	24.8		20.4	22.9	

Sources: Country authorities; and staff estimates and projections.

1/ Includes both public and private sector external debt.

2/ Derived as [r - g - ρ(1+g)]/(1+g+ρ+gρ) 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/ 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 2. Sudan: Sensitivity Analysis for Key Indicators of Public and Publicly Guaranteed External Debt, 2016–36

	Projections							
	2016	2017	2018	2019	2020	2021	**2026**	2036
PV of debt-to GDP ratio								
Baseline	82	71	63	56	50	45	**40**	30
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2016-2036 1/	82	73	65	58	51	45	**22**	6
A2. New public sector loans on less favorable terms in 2016-2036 2	82	71	64	57	51	47	**42**	35
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2017-2018	82	73	67	60	54	48	**42**	32
B2. Export value growth at historical average minus one standard deviation in 2017-2018 3/	82	72	66	60	53	48	**42**	31
B3. US dollar GDP deflator at historical average minus one standard deviation in 2017-2018	82	83	85	76	68	61	**54**	41
B4. Net non-debt creating flows at historical average minus one standard deviation in 2017-2018 4/	82	70	62	56	50	45	**39**	30
B5. Combination of B1-B4 using one-half standard deviation shocks	82	80	79	70	63	57	**50**	38
B6. One-time 30 percent nominal depreciation relative to the baseline in 2017 5/	82	96	85	76	68	61	**54**	41
PV of debt-to-exports ratio								
Baseline	1322	1204	1163	1141	1137	1159	**995**	684
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2016-2036 1/	1322	1243	1199	1165	1149	1147	**545**	129
A2. New public sector loans on less favorable terms in 2016-2036 2	1322	1210	1174	1158	1161	1190	**1057**	778
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2017-2018	1322	1204	1163	1141	1137	1159	**997**	683
B2. Export value growth at historical average minus one standard deviation in 2017-2018 3/	1322	1940	2883	2831	2823	2878	**2485**	1638
B3. US dollar GDP deflator at historical average minus one standard deviation in 2017-2018	1322	1204	1163	1141	1137	1159	**997**	683
B4. Net non-debt creating flows at historical average minus one standard deviation in 2017-2018 4/	1322	1199	1149	1127	1123	1144	**984**	680
B5. Combination of B1-B4 using one-half standard deviation shocks	1322	1529	1781	1748	1742	1775	**1527**	1047
B6. One-time 30 percent nominal depreciation relative to the baseline in 2017 5/	1322	1204	1163	1141	1137	1159	**997**	683
PV of debt-to-revenue ratio								
Baseline	868	758	687	640	597	563	**512**	390
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2016-2036 1/	868	783	708	654	603	557	**280**	74
A2. New public sector loans on less favorable terms in 2016-2036 2	868	762	694	650	609	578	**543**	444
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2017-2018	868	782	730	681	635	598	**545**	414
B2. Export value growth at historical average minus one standard deviation in 2017-2018 3/	868	774	724	675	630	594	**543**	397
B3. US dollar GDP deflator at historical average minus one standard deviation in 2017-2018	868	894	927	864	806	760	**692**	526
B4. Net non-debt creating flows at historical average minus one standard deviation in 2017-2018 4/	868	755	678	632	590	556	**506**	388
B5. Combination of B1-B4 using one-half standard deviation shocks	868	856	857	799	745	702	**639**	486
B6. One-time 30 percent nominal depreciation relative to the baseline in 2017 5/	868	1025	929	866	807	761	**693**	527

Table 2. Sudan: Sensitivity Analysis for Key Indicators of Public and Publicly Guaranteed External Debt, 2016–36 (concluded)

	Projections							
	2016	2017	2018	2019	2020	2021	**2026**	2036
Debt service-to-exports ratio								
Baseline	34	31	29	28	28	28	**22**	24
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2016-2036 1/	34	32	31	29	29	28	**12**	-3
A2. New public sector loans on less favorable terms in 2016-2036 2	34	31	29	29	28	29	**26**	33
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2017-2018	34	31	29	28	28	28	**22**	24
B2. Export value growth at historical average minus one standard deviation in 2017-2018 3/	34	48	70	70	69	69	**56**	67
B3. US dollar GDP deflator at historical average minus one standard deviation in 2017-2018	34	31	29	28	28	28	**22**	24
B4. Net non-debt creating flows at historical average minus one standard deviation in 2017-2018 4/	34	31	29	28	27	27	**22**	23
B5. Combination of B1-B4 using one-half standard deviation shocks	34	39	45	43	42	42	**34**	37
B6. One-time 30 percent nominal depreciation relative to the baseline in 2017 5/	34	31	29	28	28	28	**22**	24
Debt service-to-revenue ratio								
Baseline	22	19	17	16	14	13	**11**	14
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2016-2036 1/	22	20	18	17	15	14	**6**	-2
A2. New public sector loans on less favorable terms in 2016-2036 2	22	19	17	16	15	14	**14**	19
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2017-2018	22	20	18	17	15	14	**12**	15
B2. Export value growth at historical average minus one standard deviation in 2017-2018 3/	22	19	18	17	15	14	**12**	16
B3. US dollar GDP deflator at historical average minus one standard deviation in 2017-2018	22	23	23	21	20	18	**16**	19
B4. Net non-debt creating flows at historical average minus one standard deviation in 2017-2018 4/	22	19	17	16	14	13	**11**	13
B5. Combination of B1-B4 using one-half standard deviation shocks	22	22	21	20	18	17	**14**	17
B6. One-time 30 percent nominal depreciation relative to the baseline in 2017 5/	22	26	23	21	20	18	**16**	19
Memorandum item:								
Grant element assumed on residual financing (i.e., financing required above baseline) 6/	32	32	32	32	32	32	**32**	32

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 3. Sudan: Public Sector Debt Sustainability Framework, Baseline Scenario, 2013–36

	Actual					Estimate						Projections			
	2013	2014	2015	Average 5/	Standard Deviation 5/	2016	2017	2018	2019	2020	2021	2016-21 Average	2026	2036	2022-36 Average
Public sector debt 1/	89.9	76.8	72.9			62.8	56.7	52.8	49.5	46.6	44.4		46.3	46.8	
of which: foreign-currency denominated	79.3	66.1	59.9			53.5	47.5	43.4	39.8	36.4	33.5		32.5	28.0	
Change in public sector debt	-4.4	-13.0	-3.9			-10.1	-6.1	-3.9	-3.2	-2.9	-2.2		0.4	-0.2	
Identified debt-creating flows	-6.7	-16.7	-10.1			-8.4	-8.0	-5.7	-4.2	-3.6	-2.7		-0.1	-1.0	
Primary deficit	-0.6	-1.6	-0.8	-1.8	1.9	-0.2	0.2	0.3	1.1	1.5	2.0	0.8	2.2	1.7	2.1
Revenue and grants	11.0	12.0	11.0			9.8	9.6	9.4	9.0	8.6	8.2		7.8	7.8	
of which: grants	0.7	0.6	0.3			0.4	0.3	0.2	0.2	0.2	0.1		0.1	0.0	
Primary (noninterest) expenditure	10.4	10.4	10.3			9.6	9.8	9.7	10.1	10.2	10.2		10.1	9.5	
Automatic debt dynamics	-6.1	-15.1	-9.3			-8.2	-8.2	-5.9	-5.3	-5.2	-4.7		-2.3	-2.6	
Contribution from interest rate/growth differential	-23.9	-18.2	-10.5			-8.2	-8.2	-5.9	-5.3	-5.2	-4.7		-5.4	-5.2	
of which: contribution from average real interest rate	-19.1	-16.8	-6.9			-6.0	-6.1	-4.0	-3.5	-3.5	-3.1		-3.9	-3.7	
of which: contribution from real GDP growth	-4.7	-1.4	-3.6			-2.2	-2.1	-1.9	-1.8	-1.7	-1.6		-1.5	-1.6	
Contribution from real exchange rate depreciation	17.7	3.1	1.1			0.0	0.0	0.0	0.0	0.0	0.0		...	...	
Other identified debt-creating flows	0.0	0.0	0.0			0.0	0.0	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	0.0	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	2.3	3.7	6.1			-1.7	1.9	1.8	1.0	0.7	0.5		0.5	0.8	
Other Sustainability Indicators															
PV of public sector debt	...	...	106.2			91.0	79.8	72.3	66.1	60.6	56.2		53.6	49.2	
of which: foreign-currency denominated	...	...	93.2			81.7	70.7	63.0	56.5	50.5	45.4		39.7	30.4	
of which: external	...	...	93.2			81.7	70.7	63.0	56.5	50.5	45.4		39.7	30.4	
PV of contingent liabilities (not included in public sector debt)	...	...	...			...	...	...	...	...	...		...	...	
Gross financing need 2/	5.3	4.8	4.1			3.8	3.5	3.3	4.0	4.3	4.7		5.2	5.6	
PV of public sector debt-to-revenue and grants ratio (in percent)	...	...	963.1			923.7	833.1	769.4	733.9	703.7	684.6		682.4	628.9	
PV of public sector debt-to-revenue ratio (in percent)	...	...	993.9			966.3	856.1	788.1	750.0	717.6	696.9		690.0	632.0	
of which: external 3/	...	...	871.9			868.2	757.9	686.7	640.2	597.1	562.8		511.6	389.9	
Debt service-to-revenue and grants ratio (in percent) 4/	46.0	47.0	36.2			29.2	25.6	23.8	23.6	22.6	22.1		23.4	30.3	
Debt service-to-revenue ratio (in percent) 4/	48.9	49.6	37.4			30.5	26.3	24.4	24.1	23.0	22.5		23.7	30.4	
Primary deficit that stabilizes the debt-to-GDP ratio	3.8	11.4	3.2			9.9	6.4	4.2	4.3	4.5	4.2		1.8	1.8	
Key macroeconomic and fiscal assumptions															
Real GDP growth (in percent)	5.3	1.6	4.9	3.5	3.2	3.0	3.5	3.5	3.5	3.5	3.5	3.4	3.4	3.5	3.5
Average nominal interest rate on forex debt (in percent)	4.0	3.8	3.7	4.7	0.7	3.5	3.3	3.2	3.1	3.0	2.9	3.2	2.5	2.1	2.5
Average real interest rate on domestic debt (in percent)	-21.3	-15.8	-7.4	-4.3	10.5	-7.6	-8.6	-6.0	-4.8	-5.5	-5.5	-6.3	-7.2	-6.5	-7.0
Real exchange rate depreciation (in percent, + indicates depreciation)	28.9	4.8	2.0	12.0	22.2	0.0	...	...	...	...	...	...	...	...	...
Inflation rate (GDP deflator, in percent)	32.2	28.8	14.9	18.7	9.0	13.3	15.2	11.7	11.1	11.6	11.1	12.3	13.2	12.2	12.9
Growth of real primary spending (deflated by GDP deflator, in percent)	14.2	1.7	3.5	1.9	4.5	-3.5	5.7	1.7	7.9	4.3	3.8	3.3	3.7	3.5	3.0
Grant element of new external borrowing (in percent)	...	...	...	...	...	33.4	32.8	32.8	32.9	32.8	32.7	32.9	32.6	32.4	...

Sources: Country authorities; and staff estimates and projections.

1/ [Indicate coverage of public sector, e.g., general government or nonfinancial public sector. Also whether net or gross debt is used.]

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 4. Sudan: Sensitivity Analysis for Key Indicators of Public Debt 2016-36

	Actual					Estimate	Projections								
	2013	2014	2015	Average 5/	Standard Deviation 5/	2016	2017	2018	2019	2020	2021	2016-21 Average	2026	2036	2022-36 Average
Public sector debt 1/	89.9	76.8	72.9			62.8	56.7	52.8	49.5	46.6	44.4		46.3	46.8	
of which: foreign-currency denominated	79.3	66.1	59.9			53.5	47.5	43.4	39.8	36.4	33.5		32.5	28.0	
Change in public sector debt	-4.4	-13.0	-3.9			-10.1	-6.1	-3.9	-3.2	-2.9	-2.2		0.4	-0.2	
Identified debt-creating flows	-6.7	-16.7	-10.1			-8.4	-8.0	-5.7	-4.2	-3.6	-2.7		-0.1	-1.0	
Primary deficit	-0.6	-1.6	-0.8	-1.8	1.9	-0.2	0.2	0.3	1.1	1.5	2.0	0.8	2.2	1.7	2.1
Revenue and grants	11.0	12.0	11.0			9.8	9.6	9.4	9.0	8.6	8.2		7.8	7.8	
of which: grants	0.7	0.6	0.3			0.4	0.3	0.2	0.2	0.2	0.1		0.1	0.0	
Primary (noninterest) expenditure	10.4	10.4	10.3			9.6	9.8	9.7	10.1	10.2	10.2		10.1	9.5	
Automatic debt dynamics	-6.1	-15.1	-9.3			-8.2	-8.2	-5.9	-5.3	-5.2	-4.7		-2.3	-2.6	
Contribution from interest rate/growth differential	-23.9	-18.2	-10.5			-8.2	-8.2	-5.9	-5.3	-5.2	-4.7		-5.4	-5.2	
of which: contribution from average real interest rate	-19.1	-16.8	-6.9			-6.0	-6.1	-4.0	-3.5	-3.5	-3.1		-3.9	-3.7	
of which: contribution from real GDP growth	-4.7	-1.4	-3.6			-2.2	-2.1	-1.9	-1.8	-1.7	-1.6		-1.5	-1.6	
Contribution from real exchange rate depreciation	17.7	3.1	1.1			0.0	0.0	0.0	0.0	0.0	0.0		...	...	
Other identified debt-creating flows	0.0	0.0	0.0			0.0	0.0	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	0.0	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	2.3	3.7	6.1			-1.7	1.9	1.8	1.0	0.7	0.5		0.5	0.8	
Other Sustainability Indicators															
PV of public sector debt	...	...	106.2			91.0	79.8	72.3	66.1	60.6	56.2		53.6	49.2	
of which: foreign-currency denominated	...	...	93.2			81.7	70.7	63.0	56.5	50.5	45.4		39.7	30.4	
of which: external	...	...	93.2			81.7	70.7	63.0	56.5	50.5	45.4		39.7	30.4	
PV of contingent liabilities (not included in public sector debt)	...	...	...			...	...	...	...	...	...		...	...	
Gross financing need 2/	5.3	4.8	4.1			3.8	3.5	3.3	4.0	4.3	4.7		5.2	5.6	
PV of public sector debt-to-revenue and grants ratio (in percent)	...	...	963.1			923.7	833.1	769.4	733.9	703.7	684.6		682.4	628.9	
PV of public sector debt-to-revenue ratio (in percent)	...	...	993.9			966.3	856.1	788.1	750.0	717.6	696.9		690.0	632.0	
of which: external 3/	...	...	871.9			868.2	757.9	686.7	640.2	597.1	562.8		511.6	389.9	
Debt service-to-revenue and grants ratio (in percent) 4/	46.0	47.0	36.2			29.2	25.6	23.8	23.6	22.6	22.1		23.4	30.3	
Debt service-to-revenue ratio (in percent) 4/	48.9	49.6	37.4			30.5	26.3	24.4	24.1	23.0	22.5		23.7	30.4	
Primary deficit that stabilizes the debt-to-GDP ratio	3.8	11.4	3.2			9.9	6.4	4.2	4.3	4.5	4.2		1.8	1.8	
Key macroeconomic and fiscal assumptions															
Real GDP growth (in percent)	5.3	1.6	4.9	3.5	3.2	3.0	3.5	3.5	3.5	3.5	3.5	3.4	3.4	3.5	3.5
Average nominal interest rate on forex debt (in percent)	4.0	3.8	3.7	4.7	0.7	3.5	3.3	3.2	3.1	3.0	2.9	3.2	2.5	2.1	2.5
Average real interest rate on domestic debt (in percent)	-21.3	-15.8	-7.4	-4.3	10.5	-7.6	-8.6	-6.0	-4.8	-5.5	-5.5	-6.3	-7.2	-6.5	-7.0
Real exchange rate depreciation (in percent, + indicates depreciation)	28.9	4.8	2.0	12.0	22.2	0.0	...	...	...	...	...	...	...	...	...
Inflation rate (GDP deflator, in percent)	32.2	28.8	14.9	18.7	9.0	13.3	15.2	11.7	11.1	11.6	11.1	12.3	13.2	12.2	12.9
Growth of real primary spending (deflated by GDP deflator, in percent)	14.2	1.7	3.5	1.9	4.5	-3.5	5.7	1.7	7.9	4.3	3.8	3.3	3.7	3.5	3.0
Grant element of new external borrowing (in percent)	...	...	...	...	...	33.4	32.8	32.8	32.9	32.8	32.7	32.9	32.6	32.4	...

Sources: Country authorities; and staff estimates and projections.

1/ [Indicate coverage of public sector, e.g., general government or nonfinancial public sector. Also whether net or gross debt is used.]

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.