INTERNATIONAL MONETARY FUND AND
INTERNATIONAL DEVELOPMENT ASSOCIATION

SIERRA LEONE

Joint IMF/World Bank Debt Sustainability Analysis 2010

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

Approved by Doris C. Ross and Dominique Desruelle (IMF)
and Sudarshan Gooptu and Jan Walliser (World Bank)

November 18, 2010

Based on the low-income country (LIC) debt sustainability analysis (DSA), staff's assessment is that Sierra Leone's risk of debt distress remains moderate. Under baseline projections, all external debt indicators are below their indicative thresholds throughout the projection period (2010-30). Under the most extreme shock scenarios, however, the PV of debt to exports breaches its threshold significantly, the PV of debt to revenue breaches its threshold marginally, and the PV of debt to GDP ratio touches its threshold temporarily. Public sector debt dynamics remain on a stable path under the baseline scenario, but stress tests suggest that threats to debt sustainability remain. The analysis highlights the continued need for improved domestic revenue mobilization, the containment of low priority current expenditures, as well as growth and export-enhancing policies. Sierra Leone should continue to contract new external financing only in the form of grants and highly concessional loans and promote the development of a domestic debt market. The authorities agree with staff's assessment, highlighting the need for continued borrowing on highly concessional terms to meet the countries' large infrastructure investment needs, while stressing the importance of not unduly increasing the risk of debt distress.

I. BACKGROUND

1. **This debt sustainability analysis (DSA) updates the DSA presented in December 2009 (IMF Country Report, No. 10/15)**. It was jointly conducted by the Fund and World Bank staffs in collaboration with the authorities.

2. **Sierra Leone reached the completion point under the enhanced HIPC Initiative and qualified for debt relief under the MDRI on December 15, 2006**. In January 2007, Paris Club creditors agreed to cancel outstanding claims.[1] Debt relief from the international

[1] Sierra Leone has received debt relief under HIPC and MDRI Initiatives from the IMF, IDA, AfDB, EIB, IFAD, BADEA, IDB, and OPEC Fund. Bilateral agreements have been signed with all Paris Club creditors. Agreements on the delivery of the HIPC relief are still pending with China, Kuwait, and Saudi Arabia.

community helped decrease Sierra Leone's public sector nominal external debt from about 142 percent of GDP at end-2005 to about 32 percent of GDP at end-2007.

3. **At end-2009, Sierra Leone's nominal public and publicly guaranteed external debt, including arrears, was estimated at US$692.6 million.**[2] About 57 percent of this debt is multilateral, 8 percent bilateral, and 35 percent commercial. The largest multilateral creditors are the World Bank Group (US$124 million), the African Development Bank (US$60 million) the Islamic Development Bank (US$47 million), and the IMF (US$72 million). Debt to commercial creditors consists of arrears accumulated before and during the civil war, which ended in 2002. The Sierra Leone government is making goodwill payments to some commercial creditors to avoid litigation. With World Bank assistance, the authorities are preparing for a debt-buy-back operation of eligible commercial debt by end-2011.

4. **Domestic debt amounted to 20 percent of GDP at end-2009**. Around 80 percent of outstanding domestic debt is in the form of treasury instruments. Commercial banks and other financial institutions accounted for about one half and the Bank of Sierra Leone one quarter of the holdings.

Comparison with the 2009 DSA

(averages in percent of current GDP unless indicated)

	2009	2010-14		2015-19		2020-24		2025-29	
	Actual	DSA09	DSA10	DSA09	DSA10	DSA09	DSA10	DSA09	DSA10
Stock of external debt (eop. US$ million)	692.6	778.4	835.0	1042.5	1114.2	1405.1	1495.2	1854.1	2020.5
Stock of external debt (eop.)	40.8	29.0	31.1	27.5	29.4	26.5	28.2	25.0	27.2
Debt service on external debt	1.4	2.1	2.3	3.6	4.1	4.3	4.7	6.5	6.4
Exports of goods and nonfactor services	17.5	19.1	21.9	20.9	24.1	24.1	26.3	26.9	29.0
Current account deficit	8.4	7.4	9.4	5.5	8.6	4.7	7.5	4.5	6.9
Domestic government revenue	11.7	12.0	13.8	12.4	16.4	12.2	19.4	11.5	21.3
Domestic debt	19.7	12.1	18.0	9.0	16.0	7.4	16.1	5.9	16.1
Real GDP growth (percent)	3.2	5.6	5.5	5.1	5.5	5.0	5.5	5.0	5.5

II. Underlying DSA Assumptions

5. **While Sierra Leone was negatively affected by the global economic downturn, the medium-term outlook remains relatively favorable.** Economic activity continued to decline in the first half of 2009 due to falling global demand and declining foreign inflows. Despite a pickup in exports of diamonds and agricultural products in the second half of 2009 and an increase in domestic food production, real GDP growth for the year as a whole slowed to 3.2 percent in 2009 compared with 5.5 percent in 2008. The external current account deficit is estimated to have declined to 8.4 percent of GDP in 2009 from 11.5 percent of GDP

[2] Public sector refers to central government and the nonfinancial public sector. This includes USD$240 million of unreconciled commercial debt for which a debt-buy-back operation is pending.

Box 1. Baseline Macroeconomic Assumptions Underlying the DSA

- Economic activity is projected to recover gradually with real GDP reaching 6 percent by 2012 and declining thereafter towards a steady state of 5.5 percent by 2018. Medium- to long-term growth is predicated on the government's ongoing policies to consolidate macroeconomic stabilization, expand basic public infrastructure, and improve the business environment for private sector development.
- Monetary and exchange rate policies will aim to bring 12-month (end of period CPI) inflation down to 8 percent at end-2012, from a projected inflation of 16 percent at end-2010, and to a steady state of 5.4 percent by 2016. The projection reflects the WEO assumptions on the prices of the main commodities, as well as the authorities' commitment to refrain from central bank financing and to strengthen central bank capacity in conducting monetary policy.
- Exports are expected to benefit from a projected increase in commodity prices, expansion in mining capacity, and increased investment in agriculture. Exports of goods and services are projected to gradually increase from about 18 percent of GDP in 2009 to 31 percent by 2030. Imports of goods and services are projected to gradually increase from about 31 percent of GDP in 2009 to 40 percent in 2030.
- The new GST together with ongoing strengthening and modernization of customs and tax administration is expected to gradually broaden the tax base, raising domestic revenue from 11.8 percent of GDP in 2009 to 14.5 percent by 2012 and gradually to 22.5 percent by 2030. Current expenditures are projected to gradually increase from 15 percent to 19.5 percent of GDP by 2030, while public capital expenditures are expected to gradually increase from 7 percent of GDP in 2009 to 12 percent by 2030 in order to address the substantial infrastructure needs of the country. The overall fiscal deficit, including grants, is projected to slightly increase from 3.2 percent of GDP in 2009 to 3.5 percent by 2030.
- Total donor assistance, including grants and concessional loans, is expected to decline from the current level of 10 percent of GDP to 8 percent of GDP in the medium term. Budget support is projected to decline gradually from 5.2 percent of GDP in 2009 to 0.6 percent by 2030.
- It is assumed that about US$240 million of unreconciled commercial debt would be eligible for the World Bank assisted debt buy-back operation in 2011.
- Domestic debt is expected to decline gradually from 19 percent of GDP in 2009 to 16 percent in 2030, as the government refrains from central bank borrowing and limits issuance of new securities. In the outer years, domestic debt in percent of GDP is projected to be significantly higher than envisaged under the 2009 DSA because of higher annual fiscal deficits reflecting investment in infrastructure and social services. Domestic debt includes treasury bills, treasury bearer bonds, non-interest bearing bonds, recapitalization bond, ways and means advances, and domestic arrears.

in 2008, reflecting an increase in official transfers and weak imports. After a long period of stability, the leone depreciated against the US dollar by about 25 percent in 2009, mostly reflecting weaker inflows from exports. The medium-term outlook is, however, favorable for Sierra Leone. Economic growth will benefit from the recent completion of the Bumbuna power station, investment in basic infrastructure, initiatives to improve the business climate and raise agricultural productivity, and continued macroeconomic stability. This should support a recovery of real GDP growth to 4.5 percent in 2011 and to 6 percent in 2012. An expected recovery in export demand for minerals and cash crops should contribute to exchange rate stability. Monetary and exchange rate policies will aim to bring 12-month CPI inflation down to 8 percent at end-2012 from a projected inflation of 16 percent at end-2010. The baseline macroeconomic assumptions underlying this DSA are summarized in Box 1.[3]

III. External Debt Sustainability

A. Baseline

6. **Under the baseline scenario, the debt indicators are projected to remain below the corresponding thresholds throughout the projection period**. The PV of debt-to-GDP ratio would remain in the range of 19-22 percent throughout.[4] The PV of external debt to exports is projected to decline from 108 percent in 2009 to 95 percent in 2015, 79 percent by 2020, and 63 percent in 2030. The PV of debt-to-revenue ratio declines from a peak of 159 in 2009 to 87 by 2030, below its 200 percent threshold. The ratios of debt-service-to exports and debt-service-to-revenue remains well below their thresholds throughout the projection period (Table 1).[5]

B. Alternative Scenarios and Stress Tests

7. **The alternative scenarios highlight the need for maintaining prudent external debt management and refraining from non-concessional borrowing**. Under an alternative scenario that assumes less favorable borrowing terms, the PV of debt-to-exports ratio breached the indicative thresholds (A2, Table 2a). It would therefore be important to pursue a prudent external debt management policy, relying mostly on grants and highly concessional loans. The government has expressed interest in technical assistance from the Bank and the Fund on developing a Medium Term Debt Management Strategy (MTDS).

8. **Under the standard stress tests, public debt ratios are sensitive to an export shock and a one-time real depreciation of 30 percent in 2011**. These highlight the vulnerability of the economy to adverse external developments. Notably the analysis shows

---

[3] The impact of two new iron ore projects is not reflected in the baseline because of limited information.

[4] Sierra Leone remains rated as a weak performer with regard to its policies and institutions with an average 2007–09 Country Policy and Institutional Assessment (CPIA) rating of 3.14. As a poor performer, the debt and debt service thresholds under the joint IMF-WB DSA framework for LICs applied to Sierra Leone are: (i) 100 percent for Present Value (PV) of debt-to-exports; (ii) 30 percent for PV of debt-to-GDP; and (iii) 200 percent for PV of debt-to-revenue. The relevant debt service thresholds are (i) 15 percent of exports; and (ii) 25 percent of revenues.

[5] While the nominal value of public debt includes USD$240 million of unreconciled commercial debt for which a debt-buy-back operation is pending in 2011, the present value calculation includes 10 percent of this nominal debt stock, reflecting the expected payments in the debt-buy-back. It should be noted, however, that all the external debt thresholds would be breached temporarily in 2010 in the case of treating the full amount at face value in the present value calculation prior to the debt buy-back in 2011.

that the debt-to-exports ratio is particularly sensitive to export shocks. Under the most extreme bound test of a one standard deviation export shock (B2), the PV of debt-to-exports-ratio would reach 159 percent of exports in 2012, gradually declining to 89 percent in 2030.[6] A combination shock (B5), which reduces growth in exports, real GDP, net FDI inflows, and the GDP deflator in U.S. dollar terms by half a standard deviation, would also breach the threshold, but to a lesser degree. The most extreme stress test for the debt-to-GDP and debt-to-revenue indicators represents a one-time 30 percent real exchange rate depreciation relative to the baseline in 2011. This results in a temporary breach of the indicative threshold of the debt to revenue indicator, while the threshold is touched but not breached in the case of the debt-to-GDP ratio. Finally, none of the stress tests for the liquidity indicators breach their corresponding thresholds. Overall, however, the tests underscore the importance of strengthening the environment for economic growth and export oriented policies, including continuing infrastructure investment and financial deepening.

IV. Fiscal Debt Sustainability

A. Baseline

9. **Under the baseline, Sierra Leone's total public debt burden (including domestic debt) is expected to stabilize over the projection period**.[7] The baseline macroeconomic scenario assumes a marginal and gradual reduction in domestic financing relative to GDP. With moderate domestic financing, domestic debt is expected to decline from 19 percent of GDP in 2009 to 16 percent by 2030. This trend helps offset the increase in external debt, so that the public debt-to-GDP ratio would decline from 60 percent of GDP in 2009 to 44 percent by 2030. While a lower relative accumulation of domestic debt is a positive development, there is a need to develop a more competitive domestic debt market that could result in lower nominal and real interest rates and longer maturities (Table 3).

B. Alternative Scenarios and Stress Tests

10. **In order to avoid unfavorable developments in public debt dynamics, the primary fiscal deficit needs to be contained going forward.** Under an alternative scenario assuming an unchanged primary balance from 2010, the PV of debt-to-GDP ratio would moderately increase after 2020, compared to the baseline during the projection period. This underscores the importance of improving domestic revenue mobilization and containing non-priority current expenditures (Table 4). Under bound tests, a one standard deviation growth shock in 2011-12, and a one-time 30 percent depreciation, would moderately increase the corresponding PV of debt ratios.

[6] Due to large fluctuations in the economic data following the end of the civil war in 2002, stress tests and alternative scenarios have been calibrated to use a 5-year historical period.

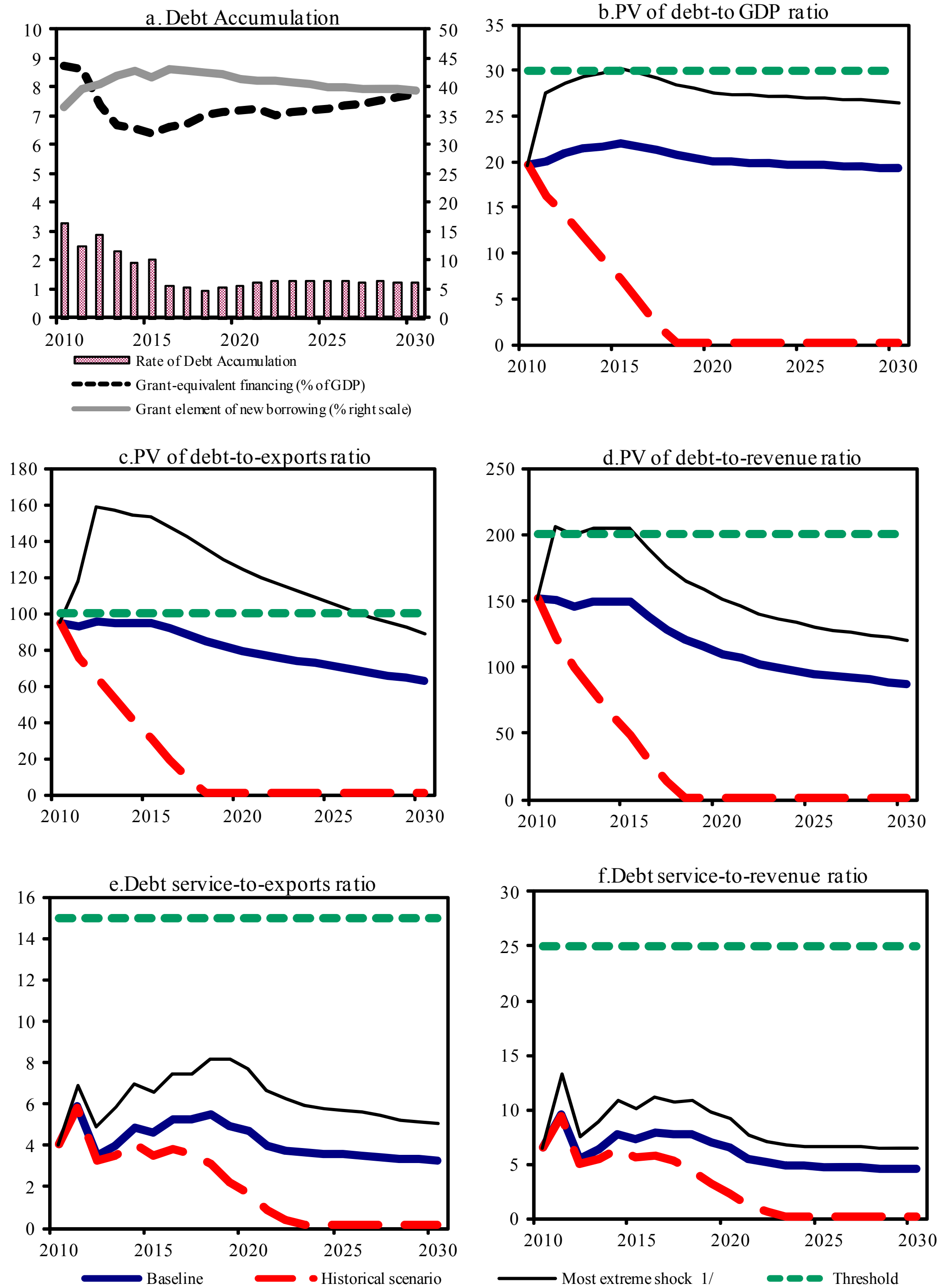
[7] Public debt reflects current and committed government obligations.

V. Debt Distress Classification and Conclusions

11. **Based on the LIC-DSA framework, Sierra Leone remains at moderate risk of external debt distress.** Under the baseline scenario, debt indicators are below the indicative, country-specific policy dependent thresholds. Stress tests reveal that Sierra Leone's external debt trajectory is still vulnerable to shocks affecting its external sector. The evolution of external debt critically hinges on policies aimed at boosting growth and diversifying the export base, while continuing to access grants and highly concessional loans.

12. **Although domestic debt is projected to decline significantly over time relative to GDP, it does not affect the overall assessment.** A slowdown in domestic debt accumulation does, however, lessen liquidity and rollover risks associated with its short maturities. Stress tests underline the importance of improving domestic revenue mobilization and containing non-priority expenditures. Policies should aim at developing the domestic debt market.

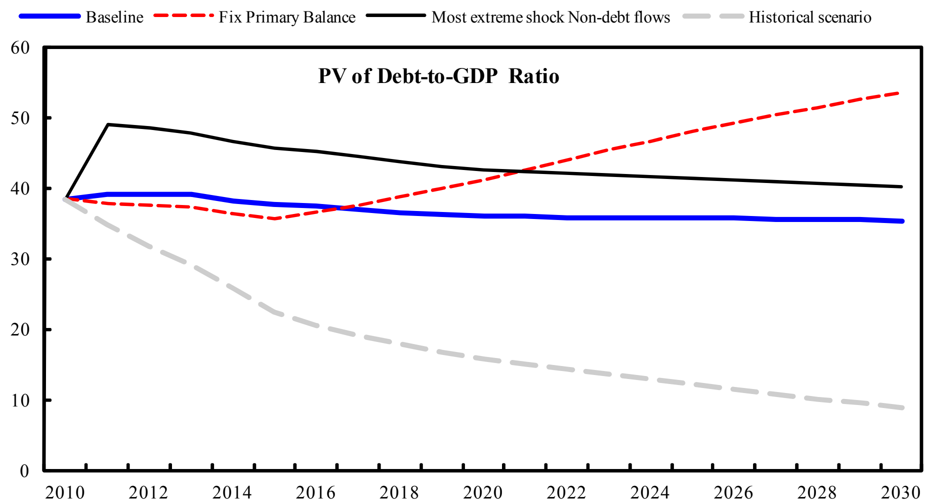
Figure 1. Sierra Leone: Indicators of Public and Publicly Guaranteed External Debt under Alternatives Scenarios, 2010-2030 1/

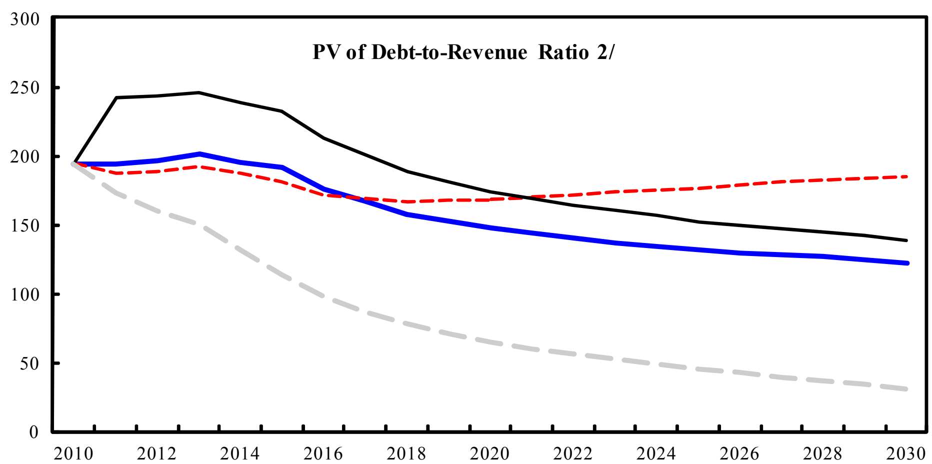


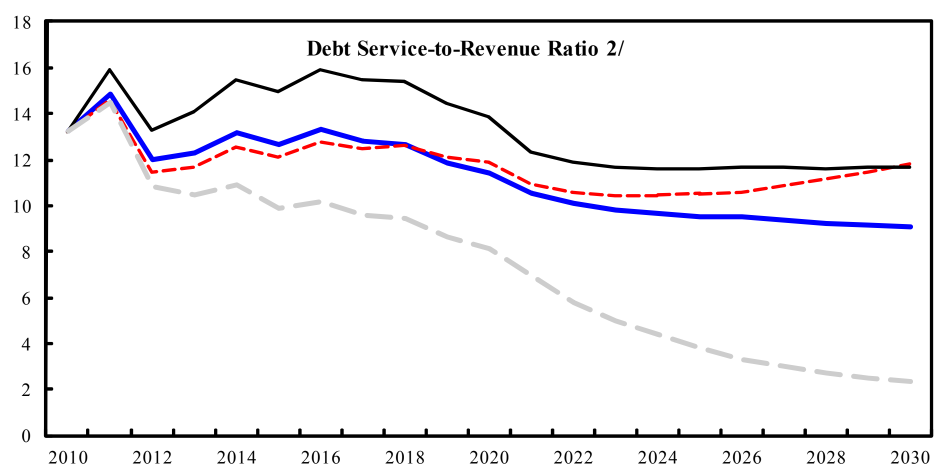
Sources: Country authorities; and staff estimates and projections.

1/ The most extreme stress test is the test that yields the highest ratio in 2020. 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.Sierra Leone: Indicators of Public Debt Under Alternative Scenarios, 2010-2030 1/







Sources: Country authorities; and staff estimates and projections.

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

2/ Revenues are defined inclusive of grants.

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

	Actual			Historical Average	Standard Deviation	Projections									
	2007	2008	2009			2010	2011	2012	2013	2014	2015	2010-15 Average	2020	2030	2016-30 Average
External debt (nominal) 1/	**31.7**	**31.8**	**40.8**			**40.4**	**29.6**	**30.9**	**31.8**	**32.3**	**33.0**		**30.3**	**28.0**	
o/w public and publicly guaranteed (PPG)	31.7	31.8	40.8			40.4	29.6	30.9	31.8	32.3	33.0		30.3	28.0	
Change in external debt	-78.6	0.0	9.0			-0.4	-10.8	1.3	0.9	0.5	0.7		-0.5	-0.3	
Identified net debt-creating flows	-16.2	4.0	6.1			5.5	5.4	5.3	5.0	4.8	4.9		3.8	2.5	
Non-interest current account deficit	**5.1**	**11.3**	**8.2**	**4.9**	**3.6**	**9.3**	**9.3**	**9.3**	**9.0**	**8.9**	**8.8**		**7.7**	**6.3**	7.3
Deficit in balance of goods and services	9.0	13.3	13.5			13.9	12.5	12.2	11.9	11.6	11.4		9.9	9.0	
Exports	19.7	17.2	17.5			20.7	21.5	22.0	22.5	22.9	23.3		25.3	30.8	
Imports	28.7	30.5	30.9			34.6	34.0	34.2	34.4	34.5	34.7		35.3	39.7	
Net current transfers (negative = inflow)	-5.7	-5.7	-7.0	-10.4	4.7	-5.9	-4.6	-4.3	-4.1	-4.0	-3.8		-3.5	-3.0	-3.3
o/w official	-3.5	-4.0	-4.5			-3.4	-2.1	-1.8	-1.6	-1.5	-1.3		-1.0	-0.5	
Other current account flows (negative = net inflow)	1.8	3.6	1.7			1.4	1.4	1.3	1.3	1.3	1.3		1.2	0.3	
Net FDI (negative = inflow)	**-5.8**	**-3.0**	**-4.0**	**-4.0**	**2.3**	**-2.4**	**-2.3**	**-2.6**	**-2.6**	**-2.6**	**-2.6**		**-2.6**	**-2.6**	-2.6
Endogenous debt dynamics 2/	**-15.6**	**-4.3**	**1.9**			**-1.5**	**-1.6**	**-1.4**	**-1.5**	**-1.5**	**-1.4**		**-1.4**	**-1.2**	
Contribution from nominal interest rate	0.4	0.4	0.3			0.3	0.3	0.2	0.2	0.2	0.2		0.2	0.2	
Contribution from real GDP growth	-6.1	-1.5	-1.1			-1.8	-1.9	-1.6	-1.7	-1.8	-1.7		-1.6	-1.5	
Contribution from price and exchange rate changes	-9.9	-3.2	2.7			…	…	…	…	…	…		…	…	
Residual (3-4) 3/	**-62.4**	**-3.9**	**2.9**			**-5.8**	**-16.2**	**-4.0**	**-4.1**	**-4.4**	**-4.1**		**-4.3**	**-2.8**	
o/w exceptional financing	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
PV of external debt 4/	...	...	18.7			19.7	20.0	20.9	21.4	21.6	22.0		20.1	19.2	
In percent of exports	...	...	107.4			94.8	93.1	95.0	95.0	94.3	94.6		79.2	62.6	
PV of PPG external debt	**...**	**...**	**18.7**			**19.7**	**20.0**	**20.9**	**21.4**	**21.6**	**22.0**		**20.1**	**19.2**	
In percent of exports	**...**	**...**	**107.4**			**94.8**	**93.1**	**95.0**	**95.0**	**94.3**	**94.6**		**79.2**	**62.6**	
In percent of government revenues	**...**	**...**	**158.4**			**151.3**	**150.1**	**145.9**	**149.1**	**148.8**	**148.6**		**109.8**	**87.3**	
Debt service-to-exports ratio (in percent)	**8.3**	**3.2**	**4.3**			**4.0**	**5.9**	**3.5**	**4.0**	**4.9**	**4.6**		**4.7**	**3.3**	
PPG debt service-to-exports ratio (in percent)	**8.3**	**3.2**	**4.3**			**4.0**	**5.9**	**3.5**	**4.0**	**4.9**	**4.6**		**4.7**	**3.3**	
PPG debt service-to-revenue ratio (in percent)	**15.0**	**4.7**	**6.4**			**6.4**	**9.5**	**5.4**	**6.3**	**7.7**	**7.2**		**6.5**	**4.6**	
Total gross financing need (Billions of U.S. dollars)	0.3	0.4	0.3			0.4	0.4	0.2	0.2	0.2	0.2		0.3	0.4	
Non-interest current account deficit that stabilizes debt ratio	83.7	11.2	-0.8			9.7	20.2	7.9	8.1	8.5	8.1		8.2	6.6	
Key macroeconomic assumptions															
Real GDP growth (in percent)	6.4	5.5	3.2	6.6	1.9	4.5	5.2	6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5
GDP deflator in US dollar terms (change in percent)	9.8	11.2	-7.8	3.7	7.4	-1.7	5.3	4.2	2.2	2.1	1.5	2.3	1.4	1.4	1.4
Effective interest rate (percent) 5/	0.4	1.3	0.9	1.2	0.7	0.8	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Growth of exports of G&S (US dollar terms, in percent)	3.4	2.3	-3.4	10.9	14.5	22.0	14.8	12.9	11.3	9.9	8.8	13.3	8.9	9.2	9.0
Growth of imports of G&S (US dollar terms, in percent)	5.0	24.5	-3.6	8.7	13.9	14.9	9.0	11.0	9.0	8.5	7.5	10.0	7.4	8.5	8.0
Grant element of new public sector borrowing (in percent)	...	...	...	...	...	36.7	39.6	40.4	42.0	42.9	41.8	40.6	41.4	39.5	41.0
Government revenues (excluding grants, in percent of GDP)	10.9	11.5	11.8			13.0	13.3	14.3	14.4	14.5	14.8		18.3	22.0	19.5
Aid flows (in Billions of US dollars) 7/	0.1	0.1	0.2			0.2	0.2	0.2	0.2	0.2	0.3		0.4	0.7	
o/w Grants	0.1	0.1	0.1			0.1	0.1	0.1	0.1	0.1	0.1		0.3	0.6	
o/w Concessional loans	0.0	0.1	0.1			0.1	0.1	0.1	0.1	0.1	0.1		0.1	0.2	
Grant-equivalent financing (in percent of GDP) 8/	...	...	...			8.8	8.6	7.4	6.7	6.6	6.4		7.2	7.8	7.2
Grant-equivalent financing (in percent of external financing) 8/	...	...	...			72.1	75.6	73.4	74.5	75.5	74.7		83.0	84.4	83.2
Memorandum items:															
Nominal GDP (Billions of US dollars)	1.7	2.0	1.9			1.9	2.1	2.3	2.5	2.7	2.9		4.1	8.1	
Nominal dollar GDP growth	16.9	17.3	-4.9			2.7	10.8	10.5	8.3	8.2	7.1	7.9	7.0	7.0	7.0
PV of PPG external debt (in Billions of US dollars)			0.3			0.4	0.4	0.5	0.5	0.6	0.6		0.8	1.5	
(PVt-PVt-1)/GDPt-1 (in percent)						3.3	2.5	2.9	2.3	1.9	2.0	2.5	1.1	1.2	1.2
Gross remittances (Billions of US dollars)	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.1	0.1	
PV of PPG external debt (in percent of GDP + remittances)	...	...	18.4			19.3	19.7	20.5	21.1	21.2	21.7		19.7	18.9	
PV of PPG external debt (in percent of exports + remittances)	...	...	98.0			87.7	86.4	88.3	88.4	87.9	88.3		74.3	59.4	
Debt service of PPG external debt (in percent of exports + remittances)	...	...	4.0			3.7	5.5	3.3	3.7	4.6	4.3		4.4	3.1	

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 project grants (3 and 4 percent of GDP annually), exceptional financing (changes in arrears and debt relief); changes in gross foreign assets; and valuation adjustments. For projections also includes contribution from price and exch. rate changes. The large residual in 2007 includes HIPC relief and in 2011 the pending debt buyback.

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 derived over the past 5 years due to large fluctuations in the post-conflict economic data.

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

	Projections							
	2010	2011	2012	2013	2014	2015	**2020**	2030
PV of debt-to GDP ratio								
Baseline	20	20	21	21	22	22	**20**	19
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2010-2030 1/	20	16	14	12	9	7	**-2**	-3
A2. New public sector loans on less favorable terms in 2010-2030 2	20	21	23	24	25	27	**27**	29
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2011-2012	20	20	21	22	22	22	**20**	19
B2. Export value growth at historical average minus one standard deviation in 2011-2012 3/	20	22	26	26	26	26	**23**	20
B3. US dollar GDP deflator at historical average minus one standard deviation in 2011-2012	20	21	23	24	24	25	**23**	22
B4. Net non-debt creating flows at historical average minus one standard deviation in 2011-2012 4/	20	19	19	19	20	20	**19**	19
B5. Combination of B1-B4 using one-half standard deviation shocks	20	20	22	23	23	24	**21**	20
B6. One-time 30 percent nominal depreciation relative to the baseline in 2011 5/	20	27	29	29	30	30	**28**	26
PV of debt-to-exports ratio								
Baseline	95	93	95	95	94	95	**79**	63
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2010-2030 1/	95	76	65	52	41	31	**-10**	-10
A2. New public sector loans on less favorable terms in 2010-2030 2	95	97	103	107	110	114	**107**	95
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2011-2012	95	91	93	93	92	93	**78**	62
B2. Export value growth at historical average minus one standard deviation in 2011-2012 3/	95	118	159	157	154	154	**124**	89
B3. US dollar GDP deflator at historical average minus one standard deviation in 2011-2012	95	91	93	93	92	93	**78**	62
B4. Net non-debt creating flows at historical average minus one standard deviation in 2011-2012 4/	95	87	85	86	86	87	**74**	60
B5. Combination of B1-B4 using one-half standard deviation shocks	95	101	120	119	119	119	**99**	78
B6. One-time 30 percent nominal depreciation relative to the baseline in 2011 5/	95	91	93	93	92	93	**78**	62
PV of debt-to-revenue ratio								
Baseline	151	150	146	149	149	149	**110**	87
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2010-2030 1/	151	122	99	82	65	49	**-13**	-15
A2. New public sector loans on less favorable terms in 2010-2030 2	151	156	158	168	174	179	**149**	133
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2011-2012	151	149	146	150	150	150	**111**	88
B2. Export value growth at historical average minus one standard deviation in 2011-2012 3/	151	162	179	181	179	177	**127**	91
B3. US dollar GDP deflator at historical average minus one standard deviation in 2011-2012	151	159	163	167	167	167	**124**	98
B4. Net non-debt creating flows at historical average minus one standard deviation in 2011-2012 4/	151	141	131	135	135	136	**102**	84
B5. Combination of B1-B4 using one-half standard deviation shocks	151	149	157	160	160	160	**118**	92
B6. One-time 30 percent nominal depreciation relative to the baseline in 2011 5/	151	206	200	204	204	204	**151**	120

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

	2010	2011	2012	2013	2014	2015	2020	2030
Debt service-to-exports ratio								
Baseline	4	6	4	4	5	5	**5**	3
A. Alternative Scenarios								
A2. New public sector loans on less favorable terms in 2010-2030 2	4	6	4	5	6	6	**6**	6
A3. Alternative Scenario :[Costumize, enter title]	4	6	4	4	5	5	**4**	0
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2011-2012	4	6	4	4	5	5	**5**	3
B2. Export value growth at historical average minus one standard deviation in 2011-2012 3/	4	7	5	6	7	7	**8**	5
B3. US dollar GDP deflator at historical average minus one standard deviation in 2011-2012	4	6	4	4	5	5	**5**	3
B4. Net non-debt creating flows at historical average minus one standard deviation in 2011-2012 4/	4	6	3	4	5	5	**4**	3
B5. Combination of B1-B4 using one-half standard deviation shocks	4	7	4	5	6	6	**6**	4
B6. One-time 30 percent nominal depreciation relative to the baseline in 2011 5/	4	6	4	4	5	5	**5**	3
Debt service-to-revenue ratio								
Baseline	6	9	5	6	8	7	**7**	5
A. Alternative Scenarios								
A2. New public sector loans on less favorable terms in 2010-2030 2	6	9	6	7	9	9	**8**	8
A3. Alternative Scenario :[Costumize, enter title]	6	10	6	7	8	8	**5**	0
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2011-2012	6	10	6	6	8	7	**7**	5
B2. Export value growth at historical average minus one standard deviation in 2011-2012 3/	6	9	6	7	8	8	**8**	5
B3. US dollar GDP deflator at historical average minus one standard deviation in 2011-2012	6	10	6	7	9	8	**7**	5
B4. Net non-debt creating flows at historical average minus one standard deviation in 2011-2012 4/	6	9	5	6	8	7	**6**	4
B5. Combination of B1-B4 using one-half standard deviation shocks	6	10	6	7	8	8	**7**	5
B6. One-time 30 percent nominal depreciation relative to the baseline in 2011 5/	6	13	8	9	11	10	**9**	6
Memorandum item:								
Grant element assumed on residual financing (i.e., financing required above baseline) 6/	40	40	40	40	40	40	**40**	40

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.Sierra Leone: Public Sector Debt Sustainability Framework, Baseline Scenario, 2007-2030
(In percent of GDP, unless otherwise indicated)

	Actual			Average	Standard Deviation	Estimate					Projections				
	2007	2008	2009			2010	2011	2012	2013	2014	2015	2010-15 Average	2020	2030	2016-30 Average
Public sector debt 1/	55.2	53.7	60.4			59.2	48.5	49.2	49.4	48.9	48.7		46.2	44.1	
o/w foreign-currency denominated	31.7	32.9	41.6			40.9	29.9	31.0	31.8	32.3	33.0		30.3	28.0	
Change in public sector debt	-81.5	-1.5	6.7			-1.3	-10.6	0.6	0.2	-0.5	-0.2		-0.4	-0.2	
Identified debt-creating flows	-19.6	-3.3	6.6			-4.0	-1.3	-0.2	0.0	0.0	0.8		-0.6	-0.4	
Primary deficit	-0.4	2.6	1.6	0.1	2.2	2.7	3.8	3.2	2.7	2.7	3.0	3.0	1.0	1.1	1.1
Revenue and grants	15.7	16.0	19.7			19.8	20.1	19.9	19.4	19.5	19.6		24.4	28.9	
of which: grants	4.8	4.5	7.9			6.8	6.8	5.6	5.0	5.0	4.8		6.1	6.8	
Primary (noninterest) expenditure	15.3	18.7	21.4			22.5	23.9	23.0	22.1	22.2	22.6		25.5	30.0	
Automatic debt dynamics	-18.2	-5.3	5.5			-6.3	-4.2	-3.1	-2.7	-2.7	-2.2		-1.7	-1.5	
Contribution from interest rate/growth differential	-11.3	-3.5	-1.3			-3.2	-2.7	-2.5	-2.5	-2.5	-2.2		-1.8	-1.6	
of which: contribution from average real interest rate	-3.0	-0.6	0.4			-0.6	0.2	0.3	0.3	0.3	0.3		0.6	0.7	
of which: contribution from real GDP growth	-8.3	-2.9	-1.7			-2.6	-2.9	-2.7	-2.8	-2.8	-2.5		-2.4	-2.3	
Contribution from real exchange rate depreciation	-6.9	-1.8	6.8			-3.1	-1.5	-0.6	-0.2	-0.2	0.0		...	...	
Other identified debt-creating flows	-1.0	-0.6	-0.5			-0.4	-0.8	-0.2	0.0	0.0	0.0		0.0	0.0	
Privatization receipts (negative)	-0.1	-0.1	-0.2			-0.1	-0.6	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)	-0.9	-0.5	-0.4			-0.3	-0.2	-0.2	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	-61.9	1.8	0.1			2.7	-9.3	0.8	0.2	-0.6	-1.0		0.2	0.2	
Other Sustainability Indicators															
PV of public sector debt	23.5	22.0	38.4			38.4	39.0	39.1	39.0	38.2	37.7		35.9	35.3	
o/w foreign-currency denominated	0.0	1.2	19.6			20.2	20.3	20.9	21.4	21.6	22.0		20.1	19.2	
o/w external	...	...	18.7			19.7	20.0	20.9	21.4	21.6	22.0		20.1	19.2	
PV of contingent liabilities (not included in public sector debt)	...	...	...			...	...	...	...	...	...		...	...	
Gross financing need 2/	17.5	17.1	17.0			16.8	17.1	5.6	5.1	5.3	5.5		3.8	3.7	
PV of public sector debt-to-revenue and grants ratio (in percent)	149.2	137.0	194.5			194.0	193.5	196.8	200.7	195.7	191.9		147.1	122.4	
PV of public sector debt-to-revenue ratio (in percent)	215.0	191.1	324.4			295.6	292.4	273.5	271.2	262.9	254.6		196.6	160.4	
o/w external 3/	…	…	158.4			151.3	150.1	145.9	149.1	148.8	148.6		109.8	87.3	
Debt service-to-revenue and grants ratio (in percent) 4/	22.8	15.0	10.9			13.2	14.9	12.0	12.3	13.2	12.7		11.4	9.1	
Debt service-to-revenue ratio (in percent) 4/	32.8	21.0	18.3			20.1	22.5	16.7	16.7	17.7	16.8		15.2	11.9	
Primary deficit that stabilizes the debt-to-GDP ratio	81.1	4.1	-5.1			4.0	14.4	2.5	2.5	3.3	3.1		1.5	1.4	
Key macroeconomic and fiscal assumptions															
Real GDP growth (in percent)	6.4	5.5	3.2	6.6	1.9	4.5	5.2	6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5
Average nominal interest rate on forex debt (in percent)	0.4	1.3	0.8	1.2	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Average real interest rate on domestic debt (in percent)	-1.8	-1.6	1.9	-2.1	2.3	-3.1	2.2	2.4	2.8	3.2	4.2	1.9	6.3	6.3	6.3
Real exchange rate depreciation (in percent, + indicates depreciation)	-6.8	-6.1	21.5	0.7	11.1	-7.9	...	...	...	...	...	...	...	...	...
Inflation rate (GDP deflator, in percent)	10.6	11.1	5.3	10.9	3.5	15.0	8.5	7.3	6.3	6.0	5.1	8.0	4.5	4.5	4.5
Growth of real primary spending (deflated by GDP deflator, in percer	-0.1	0.3	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
Grant element of new external borrowing (in percent)	...	...	...	…	…	36.7	39.6	40.4	42.0	42.9	41.8	40.6	41.4	39.5	...

Sources: Country authorities; and staff estimates and projections.

1/ Public sector refers to central government and nonfinancial public sector.

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 derived over the past 5 years due to large fluctuations in the post-conflict economic data.

Table 4.Sierra Leone: Sensitivity Analysis for Key Indicators of Public Debt 2010-2030

	Projections							
	2010	2011	2012	2013	2014	2015	2020	2030
PV of Debt-to-GDP Ratio								
Baseline	38	39	39	39	38	38	36	35
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	38	35	32	29	26	22	16	9
A2. Primary balance is unchanged from 2010	38	38	37	37	36	36	41	54
A3. Permanently lower GDP growth 1/	38	39	39	39	39	39	39	50
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2011-2012	38	39	40	40	40	40	40	43
B2. Primary balance is at historical average minus one standard deviations in 2011-2012	38	37	36	36	35	35	33	33
B3. Combination of B1-B2 using one half standard deviation shocks	38	36	34	35	34	34	33	35
B4. One-time 30 percent real depreciation in 2011	38	51	49	48	46	45	41	40
B5. 10 percent of GDP increase in other debt-creating flows in 2011	38	49	48	48	46	46	43	40
PV of Debt-to-Revenue Ratio 2/								
Baseline	194	194	197	201	196	192	147	122
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	194	173	160	149	132	114	65	31
A2. Primary balance is unchanged from 2010	194	188	188	192	187	182	168	185
A3. Permanently lower GDP growth 1/	194	194	197	202	198	196	160	170
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2011-2012	194	195	202	207	203	201	161	148
B2. Primary balance is at historical average minus one standard deviations in 2011-2012	194	185	183	186	181	178	136	114
B3. Combination of B1-B2 using one half standard deviation shocks	194	179	173	177	174	171	135	120
B4. One-time 30 percent real depreciation in 2011	194	254	249	247	236	227	168	138
B5. 10 percent of GDP increase in other debt-creating flows in 2011	194	242	243	246	238	233	174	139
Debt Service-to-Revenue Ratio 2/								
Baseline	13	15	12	12	13	13	11	9
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	13	15	11	10	11	10	8	2
A2. Primary balance is unchanged from 2010	13	15	11	12	13	12	12	12
A3. Permanently lower GDP growth 1/	13	15	12	12	13	13	12	11
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2011-2012	13	15	12	12	13	13	12	10
B2. Primary balance is at historical average minus one standard deviations in 2011-2012	13	15	11	11	12	12	11	8
B3. Combination of B1-B2 using one half standard deviation shocks	13	15	11	11	12	12	11	8
B4. One-time 30 percent real depreciation in 2011	13	16	13	14	16	15	14	12
B5. 10 percent of GDP increase in other debt-creating flows in 2011	13	15	13	14	15	14	12	11

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.