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SIERRA LEONE

Joint Bank/Fund Debt Sustainability Analysis 2008

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the International Development Association

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The Debt Sustainability Analysis (DSA) finds that Sierra Leone's risk of debt distress is moderate. Furthermore, the fiscal DSA confirms that public sector debt dynamics remain on a stable path under the baseline scenario. However, the analysis also highlights the continued need for prudent macroeconomic policies as stress tests suggest that potential threats to sustainability remain.

I. BACKGROUND

1. **This debt sustainability analysis (DSA) updates the DSA presented in December 2006 (Report No. 37997-SL, Appendix 1 and EBS/06/159, Appendix I)**. This Low Income Country (LIC)-DSA update, jointly conducted by the World Bank and Fund staff, is based on: (i) the reconciled external debt database and debt service projections prepared for the HIPC completion point DSA end-2005, (ii) actual debt and macroeconomic data of 2006 and 2007; and (iii) a revised and updated macroeconomic framework for 2008–28.[1]

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 (US$240 million in end-2000 NPV terms) on Sierra Leone.[2] Debt relief from the international community helped decrease Sierra Leone's

[1] Actual debt service obligations for 2006 and 2007 and projected obligations for 2008–10 were provided by the authorities. Debt service projections for 2011 onwards were revised by the staffs. The revised numbers, actual and projected, are higher than those projected in the previous DSA.

[2] Sierra Leone has received completion point assistance from the IDA, IMF, AfDB, EIB, and IFAD. Bilateral agreements have been signed with all Paris Club creditors. Agreements on the delivery of the HIPC relief are still pending with China, Kuwait, Saudi Arabia, IsDB, OPEC Fund, and BADEA.

public sector nominal external debt from 145.9 percent of GDP at end-2005 to 32.1 percent of GDP at end-2007.

3. **At end-2007, Sierra Leone's nominal public external debt was US$523.8 million (32.1 percent of GDP).** Around 49 percent of this debt was due to multilaterals, 45 percent to commercial creditors, and 6 percent to official bilaterals. The largest multilateral creditors were the World Bank Group (US$84.8 million), the IsDB (US$35.6 million) and the IMF (US$36.3 million) followed by the AfDB and IFAD (both US$23.9 million). A debt-buy-back operation is under negotiation to cancel all eligible commercial debt and is expected to reduce the stock of commercial debt by 81.4 percent—equivalent to the HIPC common reduction factor.

4. **Domestic debt amounted to 25 percent of GDP at end-2007.** Around 51 percent of this debt was with the central bank of Sierra Leone, including a large stock of noninterest-bearing securities. Commercial banks and other financial institutions accounted for another 39 percent. Arrears to the nonfinancial private sector constituted the remaining 10 percent of debt.

II. Underlying DSA Assumptions

5. **The baseline scenario assumes an initially difficult external environment, which will normalize in the medium run.** Most importantly, the rapid increase in global oil and food prices will increase the import bill substantially in the short run.[3] Terms of trade projections are consistent with the WEO up to 2013 and are assumed to improve modestly thereafter, in line with the WEO projected trend. The baseline macroeconomic assumptions for the period 2008–10 are consistent with those underlying the PRGF-supported program for that period (see Box 1 for details).

6. **The macroeconomic scenario presented in this DSA is similar to the previous DSA, except for the larger short-run external deficit and slightly higher new borrowing.** The current DSA forecasts a larger current account deficit in 2008–11 due to sharply higher oil and food prices. This is a result of deteriorating terms of trade as the prices of exported commodities are expected to increase more slowly than imported oil and food prices. The short-term terms of trade deterioration will affect neither long-term terms of trade nor long-term growth projections. Economic growth has been averaging around 7 percent between 2005 and 2007, and is expected to slow down to an average of 4.3 percent after 2010. Based on the government's policy to gradually increase externally financed capital spending, the present scenario assumes slightly higher new debt intake. The lower levels of projected exports and domestic revenues relative to the 2006 DSA contribute to the upward tilt in the debt service ratios, particularly the debt service-to-revenue ratio.

[3] Oil represents around 40 percent of total imports while food represents 14 percent of the total.

Box 1: Baseline Macroeconomic Assumptions Underlying the DSA

Real GDP growth averaged 7.5 percent over the last five years and is projected to remain in the range of 5-6 percent over 2008–14 with an average of 4.3 percent over 2015–28. The slowdown in growth reflects the convergence towards a long-run steady-state growth rate after the reconstruction that followed the civil war. Medium-term growth is predicated on government's planned policies to consolidate macroeconomic stabilization, expand public infrastructure, and improve the business environment for private sector development. Also the mining sector is expected to gradually increase its production capacity.

Average annual inflation, as measured by the CPI, is expected to decrease from its peak in 2008 of about 14 percent to slightly below 10 percent in 2010 and then gradually to 5 percent around 2015. 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 (except for the drawdown of the MDRI account at the central bank) and to strengthen central bank capacity in conducting monetary policy. The GDP deflator is estimated using the projected CPI inflation and change in the terms of trade.

Exports are projected to benefit over the medium- and long-term from increasing commodity prices and expansion in mining capacity. With the restart in 2009 of the kimberlite diamond mine, which has been temporally shut down to allow excavation work, exports of goods and services are projected to increase gradually from 17 percent of GDP in 2007 to 28 percent in 2015 and 34 percent in 2028. Export of agricultural commodities (or cash crops) is expected to increase faster than mineral exports, with its share in exports reaching 8.0 percent by 2028 from 5.5 percent in 2008.

Imports of goods and services are projected to increase substantially in 2008-10 mainly under the impact of (i) the increase in world oil and food prices and (ii) the expected expansion of public investments in infrastructure. Imports of goods and services in percentage of GDP are projected to jump from 27 percent in 2007 to 33 percent of GDP in 2010 and then increase gradually to 42 percent in 2028.

The primary fiscal deficit is projected to gradually decrease from 2.4 percent of GDP in 2008 to 0.3 percent in 2028. The envisaged broadening of the tax base in 2009 is the result of the adoption of the value added tax, as well as ongoing strengthening and modernization of customs and tax administration which would help raise revenue by about 3 percentage points of GDP over 2008–15 and another 2 percentage points over the period 2016–28. At the same time, public expenditures would have to increase to address the substantial social and infrastructure needs of the country.

Donor support, including program and project assistance is expected to remain robust over the medium term, assuming that the authorities timely update and implement their poverty reduction strategy. Donor support during 2011–28 is projected to increase in line with the OECD nominal GDP. The grant element is expected to increase from 48 percent in 2008 to 56 percent in 2010 and remain at that level for the entire period, as financing is expected to shift to those donors whose grant element is higher.

No new debt relief is assumed beyond the buy-back of the external commercial debts that is expected to take place in late 2009. It is assumed that US$176.5 million in debt would be extinguished, with US$40.3 million in obligations remaining (following the HIPC common reduction factor).

Domestic debt is expected to decline gradually, as the government refrains from central bank borrowing and limits issuance of new securities. It is assumed that domestic accumulated arrears to local suppliers will be cleared over 2008–10. The remaining stock of non-interest bearing securities held by the central bank will be converted into interest bearing securities over the next ten years. A more aggressive schedule would be costly and could induce the need for more borrowing.

III. External Debt Sustainability

A. Baseline

7. **Under the baseline scenario, the NPV of the debt indicators will remain below the corresponding thresholds throughout the entire period.**[4] The NPV of debt-to-export ratio is expected to increase slowly from around 45 percent in 2008 to 75 percent by 2028. This scenario reflects the assumed continuous rehabilitation and development of the rich mineral resources that will maintain an increased share of exports as percent of GDP. The NPV of debt-to-GDP ratio would remain below the threshold (30 percent) during the entire projection period, though it is expected to grow from 9 to 29 percent of GDP. In addition, the debt service ratio would stay under 5 percent of exports under the baseline scenario, well below the 15 percent threshold. The favorable debt indicators show the beneficial impact of the HIPC–MDRI debt relief (in the favorable starting debt levels) and prudent macroeconomic policies (in the continued performance of these indicators throughout the forecasting period).

B. Alternative Scenarios and Stress Tests

8. **The alternative scenarios highlight the need for maintaining prudent external debt management and refraining from nonconcessional borrowing.** Under the alternative scenario that assumes external borrowing on less concessional terms (A.2), the debt burden becomes heavier over the long-term and exceeds the indicative thresholds and continues to increase further. For example, the NPV of debt-to-exports ratio would reach 123 percent by 2028 (well exceeding the threshold of 100 percent), and the NPV of debt-to-GDP would reach 48 percent of GDP, breaching the threshold of 30 percent. Therefore, it is a crucial element of prudent debt management to rely on grants or concessional loans.

9. **The analysis also shows that external debt sustainability is very sensitive to external shocks.** Under the slower export growth shock (B.2.) the NPV of debt-to-exports ratio would reach 136 percent of exports while the NPV of debt-to-revenue ratio would reach 202 percent by 2028, well above the 100 percent threshold. This reflects the impact of volatile export commodity prices for diamonds, bauxite and rutile. The result suggests the need to further diversify exports and the economy. Under most external shocks the thresholds are exceeded, which underlines the vulnerability of the economy to adverse external developments. Under most of the bounds tests, the NPV of debt-to-GDP threshold is exceeded, which underlines the vulnerability of the economy to adverse external developments.

10. **The historical scenario is more favorable than the baseline due to the recovery that followed the end of the conflict in 1997.** The historical scenario (A.1.) reflects catch-up growth as the economy was re-built, whereas the baseline projections reflect that growth rates of key variables converge to their long-run steady state based on institutional and other fundamental

[4] Sierra Leone remains rated as a poor performer with regard to its policies and institutions under the joint WB-IMF DSA framework for LICs. As a poor performer, the thresholds applied to Sierra Leone are: (i) 100 percent for Net Present Value (NPV) of debt-to-exports, (ii) 30 percent for NPV of debt-to-GDP, and (iii) 200 percent for NPV of debt-to-revenue. The relevant debt service thresholds are (i) 15 percent of exports, and (ii) 25 percent of revenues. ("*Operational Framework for Debt Sustainability Assessments in Low-Income Countries – Further Considerations*," IDA/R2005-0056 and SM/05/109, 3/29/05).

factors. Therefore, in the case of Sierra Leone, the historical scenario does not serve as an accurate "reality check" of the country's future performance, though it illustrates that debt dynamics can become more favorable.

IV. Fiscal Debt Sustainability

A. Baseline

11. **Sierra Leone's public debt burden (including domestic debt) is expected to stabilize over the projection period**. The baseline macroeconomic scenario assumes a gradual reduction in bank financing, as a result of the projected fiscal consolidation. With moderate domestic financing, the NPV of domestic debt is expected to decline from 25.3 percent of GDP in 2007 to 15.8 percent by 2015 and to 3.8 percent by 2028. This trend is offsetting the increase in external debt, so that the NPV of total public debt-to-GDP ratio would slightly increase from 31.4 percent of GDP in 2008 to 33.4 percent in 2028 (Table 3).

B. Alternative Scenarios and Stress Tests

12. **Lower GDP growth is the most unfavorable stress for public debt**. Growth-related stress tests (assuming growth at the historical average less one standard deviation in 2008–09 and permanently lower growth during 2010–28) imply a substantial worsening in the NPV of debt-to-GDP ratio. This underscores the importance of investing in public infrastructure projects with a high rate of return and accelerating structural reforms to set the stage for private-sector led growth. In addition, public debt sustainability would be supported by a reduction in domestic debt stock, an extension of the maturity of new domestic borrowing, and the development of a domestic debt market. The latter would also facilitate the conversion of non-interest bearing, non-maturing domestic debt currently in the central bank into longer-term securities.

C. Debt Distress Classification and Conclusions

13. **Sierra Leone is at moderate risk of debt distress based on external debt burden indicators**. Sierra Leone's external debt indicators have improved markedly, but due to still fragile policies and institutions and a narrow economic base the country remains at a moderate risk of debt distress under the LIC-DSA framework. Under the baseline scenario, key debt indicators are below the country-specific policy dependent thresholds after full delivery of HIPC completion point assistance, bilateral assistance beyond HIPC Initiative, and MDRI relief. However, stress tests reveal that Sierra Leone's external debt sustainability is still vulnerable to external shocks. Debt burden indicators in some stress tests rise rapidly to above the indicative thresholds especially under the lower export stress test and the less concessional borrowing scenario. This illustrates how debt sustainability critically hinges on prudent macroeconomic and external debt management policies.

14. **The fiscal DSA suggests that Sierra Leone's overall public sector debt dynamics are stable, but a gradual reduction of the domestic debt stock is vital**. A lower domestic debt stock would lessen the liquidity and the rollover risks associated with the short maturities of this debt. In order to extend the maturity of domestic borrowing, the government should promote the development of the domestic debt market. To preserve fiscal sustainability, the conversion of the remaining balance of securities will need to be conducted in a phased manner.

Table 1. Sierra Leone External Debt Sustainability Framework, Baseline Scenario, 2008–28 [1/]

(In percent of GDP, unless otherwise indicated)

	Actual			Historical Average 6/	Standard Deviation 6/	Projections									
	2005	2006	2007			2008	2009	2010	2011	2012	2013	2008–13 Average	2018	2028	2014–28 Average
External debt (nominal) 1/	**145.9**	**94.5**	**32.1**			**29.7**	**20.2**	**23.0**	**25.5**	**27.9**	**30.1**		**39.9**	**53.2**	
o/w public and publicly guaranteed (PPG)	145.9	94.5	32.1			29.7	20.2	23.0	25.5	27.9	30.1		39.9	53.2	
Change in external debt	-26.6	-51.5	-62.4			-2.4	-9.4	2.7	2.5	2.4	2.1		2.0	0.9	
Identified net debt-creating flows	-17.0	-20.8	-14.0			2.0	3.1	3.2	2.9	3.0	2.3		1.3	0.2	
Non-interest current account deficit	**6.3**	**2.3**	**3.8**	**4.5**	**1.9**	**6.4**	**6.0**	**5.9**	**5.6**	**5.3**	**4.5**		**3.7**	**2.8**	3.5
Deficit in balance of goods and services	13.2	7.6	7.4			10.3	9.5	8.5	7.6	7.4	6.6		5.5	3.9	
Exports	24.1	25.0	21.0			20.6	24.2	25.9	27.1	28.4	29.8		32.9	39.2	
Imports	37.2	32.6	28.3			30.9	33.7	34.4	34.7	35.9	36.4		38.4	43.0	
Net current transfers (negative = inflow)	-11.3	-8.2	-5.7	-11.7	3.7	-6.0	-5.5	-4.7	-4.1	-4.1	-4.0		-3.7	-3.1	-3.5
o/w official	-7.1	-5.3	-3.5			-3.8	-3.2	-2.5	-2.0	-2.0	-2.1		-2.0	-1.9	
Other current account flows (negative = net inflow)	4.4	2.8	2.1			2.1	2.1	2.1	2.1	2.0	2.0		2.0	2.0	
Net FDI (negative = inflow)	**-4.0**	**-3.0**	**-4.2**	**-2.6**	**2.3**	**-2.7**	**-1.3**	**-1.6**	**-1.6**	**-1.3**	**-1.1**		**-1.2**	**-1.0**	-1.1
Endogenous debt dynamics 2/	**-19.3**	**-20.1**	**-13.7**			**-1.7**	**-1.6**	**-1.1**	**-1.1**	**-1.0**	**-1.1**		**-1.2**	**-1.7**	
Contribution from nominal interest rate	0.8	1.2	0.0			0.1	0.1	0.1	0.1	0.2	0.3		0.3	0.5	
Contribution from real GDP growth	-11.0	-9.1	-5.5			-1.8	-1.7	-1.2	-1.2	-1.2	-1.3		-1.6	-2.2	
Contribution from price and exchange rate changes	-9.1	-12.2	-8.1			...	...	...	...	...	...		...	...	
Residual (3-4) 3/	**-9.6**	**-30.7**	**-48.4**			**-4.4**	**-12.6**	**-0.5**	**-0.3**	**-0.6**	**-0.2**		**0.7**	**0.7**	
o/w exceptional financing	-2.7	-14.7	-26.8			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
NPV of external debt 4/	...	...	8.6			9.3	11.1	12.4	13.5	14.6	15.6		20.8	29.4	
In percent of exports	...	...	41.1			45.2	45.9	47.7	49.7	51.4	52.4		63.4	75.1	
NPV of PPG external debt	...	...	**8.6**			**9.3**	**11.1**	**12.4**	**13.5**	**14.6**	**15.6**		**20.8**	**29.4**	
In percent of exports	...	...	**41.1**			**45.2**	**45.9**	**47.7**	**49.7**	**51.4**	**52.4**		**63.4**	**75.1**	
In percent of government revenues	...	...	**79.6**			**78.6**	**89.4**	**92.4**	**99.2**	**106.4**	**112.4**		**138.7**	**175.6**	
Debt service-to-exports ratio (in percent)	**9.9**	**5.4**	**4.4**			**3.2**	**2.7**	**2.6**	**2.4**	**3.1**	**2.8**		**2.6**	**4.7**	
PPG debt service-to-exports ratio (in percent)	**9.9**	**5.4**	**4.4**			**3.2**	**2.7**	**2.6**	**2.4**	**3.1**	**2.8**		**2.6**	**4.7**	
PPG debt service-to-revenue ratio (in percent)	**20.1**	**11.4**	**8.5**			**5.5**	**5.3**	**5.1**	**4.7**	**6.4**	**6.0**		**5.7**	**10.9**	
Total gross financing need (millions of U.S. dollars)	159.4	179.7	221.2			294.8	319.9	314.1	310.9	310.2	288.9		279.8	320.4	
Non-interest current account deficit that stabilizes debt ratio	32.9	53.7	66.2			8.8	15.5	3.1	3.0	2.9	2.4		1.7	1.9	
Key macroeconomic assumptions															
Real GDP growth (in percent)	7.2	7.3	6.8	7.9	9.7	6.0	6.0	6.0	5.6	5.0	4.9	5.6	4.3	4.3	4.3
GDP deflator in US dollar terms (change in percent)	5.6	9.1	9.4	0.0	10.0	2.8	-2.1	-1.6	-1.4	-1.4	-1.5	-0.9	-1.0	-1.0	-1.0
Effective interest rate (percent) 5/	0.6	1.0	0.0	0.7	0.5	0.3	0.4	0.5	0.7	1.0	1.0	0.6	0.9	1.0	0.9
Growth of exports of G&S (US dollar terms, in percent)	18.3	21.5	-1.8	13.1	20.1	7.1	22.2	11.5	9.0	8.6	8.2	11.1	4.5	5.5	5.2
Growth of imports of G&S (US dollar terms, in percent)	23.4	2.5	1.7	15.7	16.6	18.8	13.3	6.5	5.1	6.9	4.8	9.2	4.3	4.7	4.4
Grant element of new public sector borrowing (in percent)	...	...	...	...	...	47.8	51.3	56.4	56.4	56.4	56.4	54.1	56.4	56.4	56.4
Aid flows (in millions of US dollars) 7/	191.2	166.9	100.8			151.9	179.9	172.4	182.6	182.9	186.7		229.7	347.6	
o/w Grants	121.8	117.0	80.2			118.3	113.6	98.7	103.6	105.1	110.3		139.5	223.1	
o/w Concessional loans	36.4	16.2	20.7			33.6	66.3	73.7	79.0	77.7	76.3		90.2	124.5	
Grant-equivalent financing (in percent of GDP) 8/	...	...	...			7.8	8.2	7.1	7.2	7.0	7.0		7.4	8.3	7.6
Grant-equivalent financing (in percent of external financing) 8/	...	...	...			85.2	79.9	81.4	81.1	81.5	82.2		82.9	84.4	83.4
Memorandum items:															
Nominal GDP (millions of US dollars)	1214.8	1422.6	1663.5			1813.7	1882.8	1964.0	2045.4	2117.4	2188.5		2585.6	3542.6	
(NPVt-NPVt-1)/GDPt-1 (in percent)						1.5	2.2	1.8	1.7	1.7	1.5	1.7	1.9	1.5	1.7

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. The 2009 residual includes the effect of commercial debt buy-back operations.

[4/] Assumes that NPV 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.

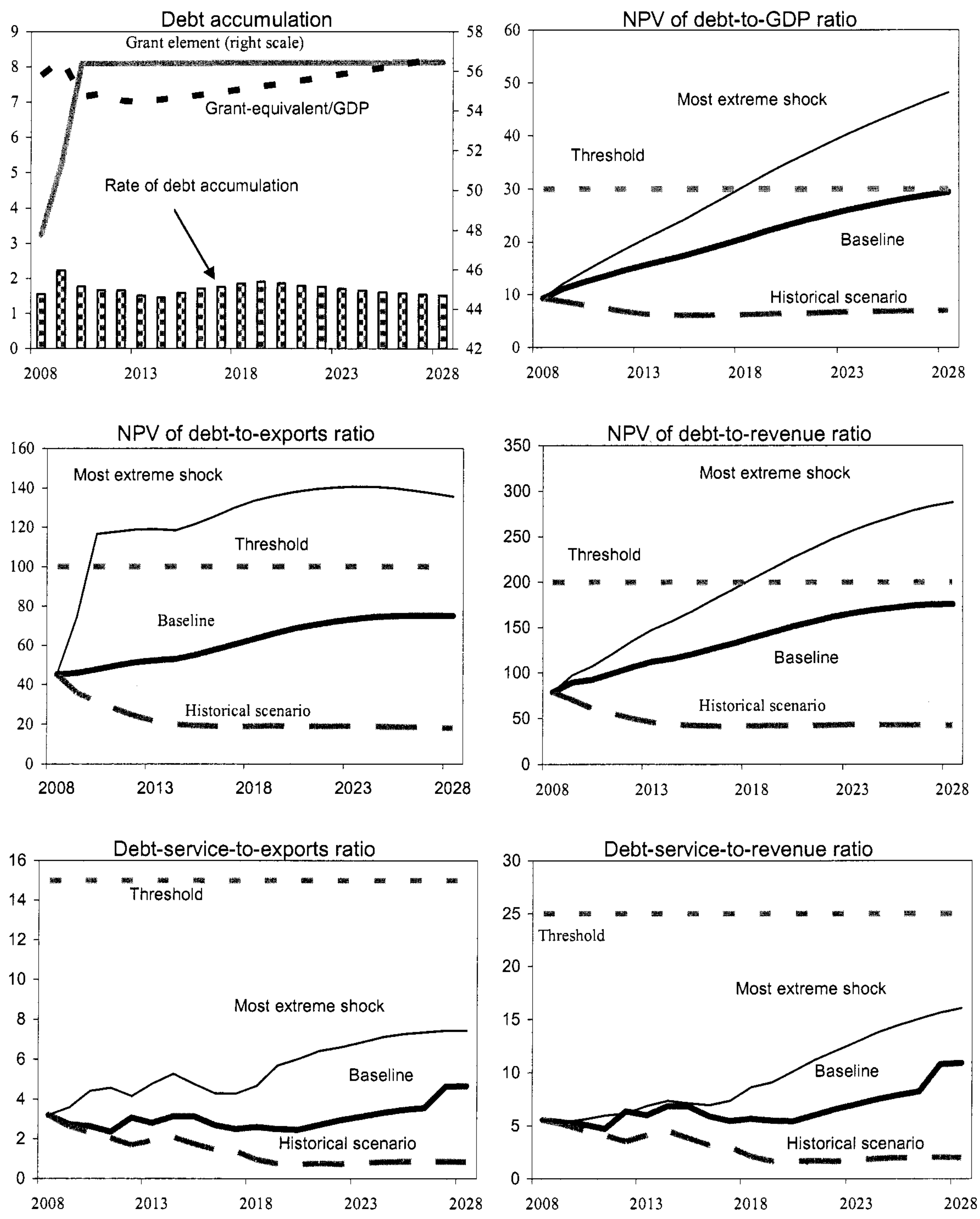
[8/] Grant-equivalent financing includes grants provided directly to the government and through new borrowing (difference between the face value and the NPV of new debt).

Table 2. Sierra Leone: Sensitivity Analyses for Key Indicators of Public and Publicly Guaranteed External Debt, 2008–28
(In percent)

		Projections						
	2008	2009	2010	2011	2012	2013	**2018**	2028
NPV of debt-to-GDP ratio								
Baseline	9	11	12	13	15	16	**21**	29
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2009-28 1/	9	9	8	7	7	6	**6**	7
A2. New public sector loans on less favorable terms in 2009-28 2/	9	12	14	16	19	21	**31**	48
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2009-10	9	12	14	16	17	18	**24**	34
B2. Export value growth at historical average minus one standard deviation in 2009-10 3/	9	14	19	20	21	23	**28**	34
B3. US dollar GDP deflator at historical average minus one standard deviation in 2009-10	9	12	15	16	17	19	**25**	35
B4. Net non-debt creating flows at historical average minus one standard deviation in 2009-10 4/	9	10	11	12	13	14	**19**	28
B5. Combination of B1-B4 using one-half standard deviation shocks	9	12	15	16	17	19	**24**	34
B6. One-time 30 percent nominal depreciation relative to the baseline in 2009 5/	9	16	18	19	21	22	**30**	42
NPV of debt-to-exports ratio								
Baseline	45	46	48	50	51	52	**63**	75
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2009–28 1/	45	36	31	28	24	21	**19**	18
A2. New public sector loans on less favorable terms in 2009–28 2/	45	50	55	61	65	69	**93**	123
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2009-10	45	46	48	50	51	52	**63**	75
B2. Export value growth at historical average minus one standard deviation in 2009-10 3/	45	74	117	118	119	119	**134**	136
B3. US dollar GDP deflator at historical average minus one standard deviation in 2009-10	45	46	48	50	51	52	**63**	75
B4. Net non-debt creating flows at historical average minus one standard deviation in 2009-10 4/	45	43	41	44	46	47	**58**	72
B5. Combination of B1-B4 using one-half standard deviation shocks	45	54	65	67	69	71	**84**	98
B6. One-time 30 percent nominal depreciation relative to the baseline in 2009 5/	45	46	48	50	51	52	**63**	75
NPV of debt-to-revenue ratio								
Baseline	79	89	92	99	106	112	**139**	176
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2009-28 1/	79	70	61	55	50	46	**42**	42
A2. New public sector loans on less favorable terms in 2009-28 2/	79	97	107	121	135	148	**203**	288
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2009-10	79	97	108	116	124	131	**162**	205
B2. Export value growth at historical average minus one standard deviation in 2009-10 3/	79	110	143	149	156	162	**186**	202
B3. US dollar GDP deflator at historical average minus one standard deviation in 2009-10	79	97	110	118	127	134	**165**	209
B4. Net non-debt creating flows at historical average minus one standard deviation in 2009-10 4/	79	84	80	87	94	100	**127**	169
B5. Combination of B1-B4 using one-half standard deviation shocks	79	95	111	118	127	133	**163**	202
B6. One-time 30 percent nominal depreciation relative to the baseline in 2009 5/	79	129	133	143	153	162	**200**	253
Debt service-to-exports ratio								
Baseline	3	3	3	2	3	3	**3**	5
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2009-28 1/	3	3	2	2	2	2	**1**	1
A2. New public sector loans on less favorable terms in 2009-28 2/	3	3	3	3	3	3	**4**	7
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2009–10	3	3	3	2	2	3	**2**	4
B2. Export value growth at historical average minus one standard deviation in 2009–10 3/	3	4	4	5	4	5	**5**	7
B3. US dollar GDP deflator at historical average minus one standard deviation in 2009–10	3	3	3	2	2	3	**2**	4
B4. Net non-debt creating flows at historical average minus one standard deviation in 2009–10 4/	3	3	3	2	2	3	**2**	4
B5. Combination of B1-B4 using one-half standard deviation shocks	3	3	3	3	3	3	**3**	5
B6. One-time 30 percent nominal depreciation relative to the baseline in 2009 5/	3	3	3	2	2	3	**2**	4
Debt service-to-revenue ratio								
Baseline	6	5	5	5	6	6	**6**	11
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2009-28 1/	6	5	5	4	4	4	**2**	2
A2. New public sector loans on less favorable terms in 2009-28 2/	6	5	6	6	6	7	**9**	16
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2009–10	6	6	6	6	5	7	**6**	10
B2. Export value growth at historical average minus one standard deviation in 2009–10 3/	6	5	5	6	5	7	**6**	11
B3. US dollar GDP deflator at historical average minus one standard deviation in 2009-10	6	6	6	6	6	7	**6**	11
B4. Net non-debt creating flows at historical average minus one standard deviation in 2009–10 4/	6	5	5	5	4	6	**5**	8
B5. Combination of B1-B4 using one-half standard deviation shocks	6	6	6	6	5	7	**6**	10
B6. One-time 30 percent nominal depreciation relative to the baseline in 2009 5/	6	8	7	7	7	8	**7**	13
Memorandum item:								
Grant element assumed on residual financing (i.e., financing required above baseline) 6/	55	55	55	55	55	55	**55**	55

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. In the baseline, the concessional IDA and other non IMF lending is assumed to bear an average 0.8 percent interest with 10 years of grace period and 40 years of maturity.
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.

Figure 1. Sierra Leone: Indicators of Public and Publicly Guaranteed External Debt Under Alternative Scenarios, 2008–28



Source: Staff projections and simulations.

Table 3. Sierra Leone: Public Sector Debt Sustainability Framework, Baseline Scenario, 2005–28

(In percent of GDP, unless otherwise indicated)

	Actual					Estimate	Projections												
	2005	2006	2007	Historical Average 5/	Standard Deviation 5/	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2008–13 Average	2018	2028	2014–28 Average
Public sector debt 1/	177.7	121.9	57.3			53.4	41.1	42.7	44.2	45.9	47.4	48.9	50.4	51.5	52.5		53.4	57.0	
o/w foreign-currency denominated	148.2	94.9	32.0			29.7	20.2	23.0	25.5	27.9	30.1	32.6	34.6	36.6	38.6		39.9	53.2	
Change in public sector debt	-40.2	-55.8	-64.6			-4.0	-12.2	1.6	1.4	1.7	1.5	1.5	1.4	1.2	1.0		0.9	-1.1	
Identified debt-creating flows	-31.9	-25.4	-15.4			-1.3	1.1	1.9	2.3	2.9	3.1	3.0	3.0	2.4	2.2		2.1	-0.4	
Primary deficit	-1.9	-1.1	-0.2	-0.1	2.0	0.4	2.0	2.7	2.8	2.7	2.5	2.2	2.0	1.8	1.6	2.2	1.4	0.8	1.4
Revenue and grants	21.9	20.0	15.6			18.4	18.5	18.4	18.7	18.7	18.9	19.3	19.6	19.9	20.2		20.4	22.9	
of which: grants	10.0	8.2	4.8			6.5	6.0	5.0	5.1	5.0	5.0	5.1	5.2	5.2	5.3		5.4	6.3	
Primary (noninterest) expenditure	20.0	18.9	15.4			18.8	20.5	21.1	21.5	21.4	21.4	21.5	21.7	21.7	21.7		21.8	23.6	
Automatic debt dynamics	-25.6	-20.8	-14.3			-1.5	-0.7	-0.6	-0.3	0.2	0.6	0.8	0.9	0.6	0.7		0.7	-1.1	
Contribution from interest rate/growth differential	-18.7	-19.4	-13.8			-3.1	-0.4	-0.5	-0.2	0.4	0.7	0.9	0.9	0.6	0.7		0.7	0.1	
of which: contribution from average real interest rate	-4.0	-7.3	-6.0			0.1	2.6	1.9	2.0	2.5	2.9	3.0	3.1	2.7	2.8		2.9	2.5	
of which: contribution from real GDP growth	-14.7	-12.2	-7.8			-3.3	-3.0	-2.3	-2.3	-2.1	-2.1	-2.1	-2.1	-2.2	-2.2		-2.1	-2.4	
Contribution from real exchange rate depreciation	-6.9	-1.4	-0.5			1.6	-0.3	-0.1	-0.1	-0.1	-0.1	-0.1	0.0	0.0	0.0		...	...	
Other identified debt-creating flows	-4.5	-3.5	-0.8			-0.2	-0.2	-0.2	-0.2	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Privatization receipts (negative)	0.0	-0.1	-0.1			0.0	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	0.0	0.0		0.0	0.0	
Debt relief (HIPC and other)	-4.5	-3.4	-0.7			-0.2	-0.2	-0.2	-0.2	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	0.0	0.0		0.0	0.0	
Residual, including asset changes	-8.3	-30.4	-49.2			-2.7	-13.4	-0.3	-0.9	-1.2	-1.6	-1.5	-1.5	-1.2	-1.2		-1.2	-0.7	
NPV of public sector debt	29.5	27.0	33.9			31.4	31.1	31.3	31.3	31.8	32.3	32.8	33.2	33.4	33.5		33.6	33.4	
o/w foreign-currency denominated	0.0	0.0	8.6			9.3	11.1	12.4	13.5	14.6	15.6	16.5	17.5	18.5	19.7		20.8	29.2	
o/w external	...	...	8.6			9.3	11.1	12.4	13.5	14.6	15.6	16.5	17.5	18.5	19.7		20.8	29.2	
NPV of contingent liabilities (not included in public sector debt)	...	...	...			...	...	...	...	...	...	...	...	...	...		...	...	
Gross financing need 2/	15.9	5.4	-9.1			16.8	16.7	16.3	16.5	15.9	15.2	14.7	14.3	13.2	12.7		12.3	9.4	
NPV of public sector debt-to-revenue and grants ratio (in percent)	134.9	135.2	217.0			171.1	168.6	170.1	167.9	169.9	171.0	169.6	169.1	168.3	166.0		164.5	145.9	
NPV of public sector debt-to-revenue ratio (in percent)	249.1	229.6	313.7			265.2	250.4	234.0	230.5	231.3	233.2	322.9	337.8	354.0	369.9		223.5	200.8	
o/w external 3/	—	—	79.6			78.6	89.4	92.4	99.2	106.4	112.4	85.3	88.9	93.3	97.3		138.7	175.6	
Debt service-to-revenue and grants ratio (in percent) 4/	44.2	36.5	32.7			25.0	25.8	21.6	20.2	22.3	22.7	23.2	22.9	19.4	18.7		18.6	15.2	
Debt service-to-revenue ratio (in percent) 4/	81.5	62.0	47.3			38.8	38.4	29.7	27.8	30.3	30.9	31.6	31.1	26.3	25.4		25.3	20.9	
Primary deficit that stabilizes the debt-to-GDP ratio	38.3	54.7	64.3			4.4	14.2	1.1	1.4	1.0	1.0	0.7	0.6	0.7	0.6		0.4	1.8	
Key macroeconomic and fiscal assumptions																			
Real GDP growth (in percent)	7.2	7.3	6.8	10.9	8.1	6.0	6.0	6.0	5.6	5.0	4.9	4.7	4.6	4.5	4.4	5.6	4.3	4.3	4.3
Average nominal interest rate on forex debt (in percent)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Average real interest rate on domestic currency debt (in percent)	2.6	3.4	-0.4	4.3	6.4	-1.2	3.0	3.0	4.0	5.8	7.6	8.7	9.3	8.0	8.6	3.7	9.4	19.9	11.4
Real exchange rate depreciation (in percent, + indicates depreciation)	-4.2	-1.0	-0.6	-1.4	3.2	5.4	...	...	...	...	...	...	...	...	...	...	...	...	...
Inflation rate (GDP deflator, in percent)	12.9	11.8	10.3	9.3	6.8	11.0	8.0	6.6	5.7	4.9	3.9	3.2	2.9	2.9	2.9	6.7	2.9	3.3	3.0
Growth of real primary spending (deflated by GDP deflator, in percent)	11.4	1.3	-12.9	2.7	11.5	29.3	15.6	9.3	7.5	4.6	5.0	5.3	5.2	4.7	4.6	11.9	4.5	5.5	5.0

Sources: Country authorities; and Fund 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 generally derived over 2001–07 due to data availability.

Table 4. Sierra Leone: Sensitivity Analysis for Key Indicators of Public Debt 2008–28

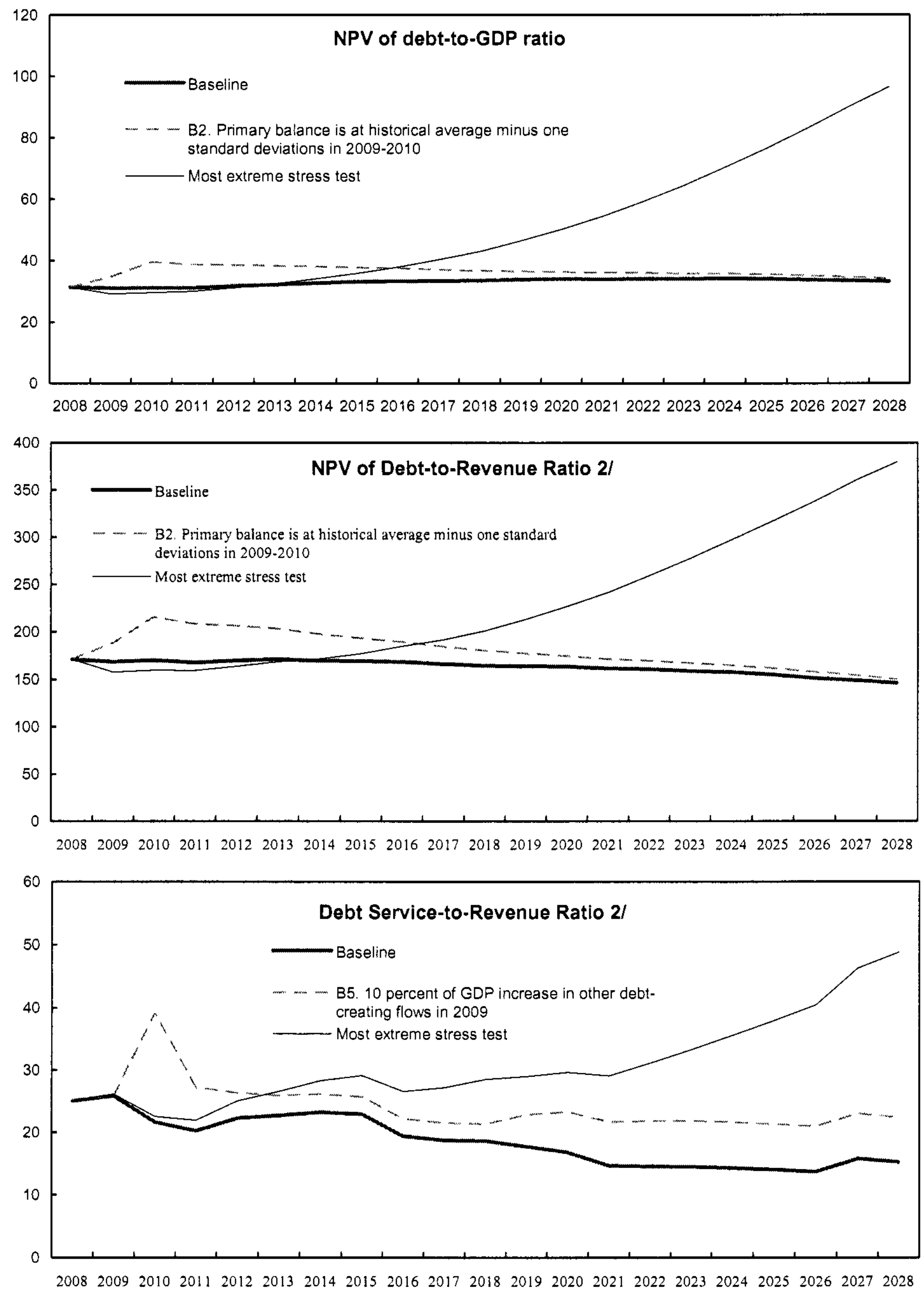
		Projections						
	2008	2009	2010	2011	2012	2013	2018	2028
NPV of Debt-to-GDP Ratio								
Baseline	31	31	31	31	32	32	34	33
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	31	25	22	19	16	14	7	5
A2. Primary balance is unchanged from 2008	31	27	25	22	19	17	7	-5
A3. Permanently lower GDP growth 1/	31	29	30	30	31	33	43	96
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2009-2010	31	29	30	30	30	30	30	33
B2. Primary balance is at historical average minus one standard deviations in 2009-2010	31	35	40	39	39	38	37	34
B3. Combination of B1-B2 using one half standard deviation shocks	31	31	32	31	31	31	30	30
B4. One-time 30 percent real depreciation in 2009	31	38	36	34	33	31	26	21
B5. 10 percent of GDP increase in other debt-creating flows in 2009	31	38	37	36	36	36	34	31
NPV of Debt-to-Revenue Ratio 2/								
Baseline	171	169	170	168	170	171	164	146
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	171	137	122	104	91	79	41	30
A2. Primary balance is unchanged from 2008	171	147	133	116	103	90	36	-21
A3. Permanently lower GDP growth 1/	171	158	160	159	164	168	201	379
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2009-2010	171	158	160	157	158	157	146	142
B2. Primary balance is at historical average minus one standard deviations in 2009-2010	171	188	215	208	206	203	180	150
B3. Combination of B1-B2 using one half standard deviation shocks	171	167	173	168	168	166	150	133
B4. One-time 30 percent real depreciation in 2009	171	207	196	182	175	166	127	92
B5. 10 percent of GDP increase in other debt-creating flows in 2009	171	205	202	196	194	190	167	137
Debt Service-to-Revenue Ratio 2/								
Baseline	25	26	22	20	22	23	19	15
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	25	25	18	14	14	14	9	4
A2. Primary balance is unchanged from 2008	25	26	19	15	16	16	12	0
A3. Permanently lower GDP growth 1/	25	26	23	22	25	27	28	49
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2009-2010	25	26	23	22	24	25	21	21
B2. Primary balance is at historical average minus one standard deviations in 2009-2010	25	26	33	35	29	27	22	24
B3. Combination of B1-B2 using one half standard deviation shocks	25	26	26	25	25	25	20	21
B4. One-time 30 percent real depreciation in 2009	25	26	22	20	22	23	19	15
B5. 10 percent of GDP increase in other debt-creating flows in 2009	25	26	39	27	26	26	21	22

Sources: Country authorities; and Fund staff estimates and projections. Negative projected NPV values imply full repayment and net reserves accumulation.

1/ Assumes that real GDP growth is at baseline minus one standard deviation divided by the square root of 20 (i.e., the length of the projection period).

2/ Revenues are defined inclusive of grants.

Figure 2. Sierra Leone: Indicators of Public Debt Under Alternative Scenarios, 2008–28 [1/]



Source: Staff projections and simulations.
1/ Most extreme stress test is test that yields highest ratio in 2018.
2/ Revenue including grants.