

INTERNATIONAL DEVELOPMENT ASSOCIATION
INTERNATIONAL MONETARY FUND

SIERRA LEONE

Joint Bank/Fund Debt Sustainability Analysis 2009

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and the International Monetary Fund

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This debt sustainability analysis for low-income countries (LIC-DSA) is based on end-2008 data for external and domestic debt provided by the Sierra Leonean authorities. 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 (2009-29). However, external debt ratios move toward the thresholds or breach them under less favorable scenarios and stress tests. Public sector debt dynamics remain on a stable path under the baseline scenario. The analysis highlights the continued need for improved domestic revenue mobilization, the containment of low priority current expenditures, and growth boosting and export-enhancing policies and programs as stress tests suggest that potential threats to sustainability remain. Moreover, 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.

I. BACKGROUND

1. **This debt sustainability analysis (DSA) updates the DSA presented in June 2008 (IDA/SecM2008-0458 and IMF Country Report, No. 08/249).** This Low Income Country (LIC)-DSA update, jointly conducted by the Bank and Fund Bank staffs in collaboration with the authorities, is based on estimated outstanding stock of external and domestic debt at end-2008 and projected debt service due in 2009-55. Projected debt service to the World Bank, the African Development Bank and the IMF was estimated by staff of these institutions. Projected debt service due to other external creditors was obtained from the authorities. Debt service due on domestic debt was provided by the authorities for the period 2009-10 and projected by the staffs for the subsequent years. The macroeconomic framework underlying this DSA was prepared by the staffs, based on the outcome of the fifth review under the PRGF-supported program.

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 PV terms) on Sierra Leone.¹ Debt relief from the international 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-2008, Sierra Leone's nominal public and publicly guaranteed external debt, including arrears, was estimated at US\$620.2 million (33 percent of GDP).** Half of this debt was due to multilaterals, 39 percent to commercial creditors, and the remainder to official bilateral creditors.² The largest multilateral creditors were the World Bank Group (US\$109 million), the IMF (US\$53.5 million), the Islamic Development Bank (US\$43.8 million) and the African Development Bank (US\$43.3 million). All external debts to commercial creditors were mostly arrears accumulated before and during the civil war, which ended in 2002. The Sierra Leone government continues to make goodwill payments to some of the commercial creditors to avoid litigation.³ A debt-buy-back operation is under preparation, with World Bank assistance, to cancel all eligible commercial debt by end-2011.⁴

4. **Domestic debt, including verified domestic arrears, amounted to 21 percent of GDP at end-2008.** Around 41 percent of this debt was with the central bank of Sierra Leone, including a large stock of non-interest bearing securities. Commercial banks and other financial institutions accounted for another 52 percent. Arrears to the non-financial private sector constituted the remaining 7 percent of domestic debt. Interest payments on domestic debt in 2008 represented 16 percent of domestic revenue and 13 percent of current expenditure.

II. UNDERLYING DSA ASSUMPTIONS

5. **The macroeconomic framework underlying this DSA differs from the one presented in the June 2008 DSA on the starting point as well as on certain critical assumptions.** Since the completion of the previous DSA, the Sierra Leonean economy has been adversely affected by the global economic downturn, which resulted in a slower economic growth and a steep decline in exports. In addition, unanticipated technical difficulties have crippled two major mining companies and anticipated foreign direct investment in the mining sector is likely to be

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.

² At present, all external loans contracted by state-owned enterprises are guaranteed by the government.

³ A lawsuit against Sierra Leone by one commercial creditor is still ongoing.

⁴ Unreconciled records suggest that the stock of external arrears to commercial creditors could be as high as US\$243 million at end-2008. In February 2009, the World Bank's Board approved a grant to fund the preparatory work for the operation, including for legal and financial advisors and audits. The preparation and implementation are estimated to take about one year each.

postponed. As a result, actual exports in 2008 are significantly lower than projected in the previous DSA. Although a pick-up in exports is expected, the revised macroeconomic framework remains cautious with the ratio of exports-to-GDP staying below the ratio projected in the previous DSA. Data provided by the authorities indicates that the stock of actual external debt in 2008 is higher than projected in the previous DSA, in part due to higher than anticipated new borrowing. A large part of the additional borrowing in 2008, as well as over 2009-10, comes from the increase in access to Fund financing, which was obtained in December 2008 and June 2009 to mitigate the impact of the global downturn on Sierra Leone's international reserves. The global economic downturn is also expected to lead to a lower domestic government revenue to GDP ratio than projected in the previous DSA. The baseline macroeconomic assumptions underlying this DSA are summarized in Box 1.

Comparison of Key Macrovariables in the New and the Previous DSA				
	2008		Annual Average over 2009–13 (unless otherwise indicated)	
	2008 DSA	New DSA	2008 DSA	New DSA
	Projections	Actual	Projections	Projections
Stock of external debt, end-of-period (US\$ million)	538.6	608.4	657.8	727.3
Total new external borrowing (US\$ million)	46.8	72.8	77.3	84.3
Debt service on external debt (US\$ million)	11.9	10.6	15.2	21.3
Real GDP growth (percent)	6.0	5.5	5.5	5.3
Exports of Goods and nonfactor services (percent of GDP)	20.6	16.3	27.1	18.2
Current account deficit (percent of GDP)	6.5	10.7	5.6	7.9
Domestic government revenue (percent of GDP)	11.9	11.4	13.4	12.5
Domestic debt (percent of GDP)	22.1	22.0	18.1	15.0

Box 1: Baseline Macroeconomic Assumptions Underlying the DSA

- Real GDP growth reached 5.5 percent in 2008 but is projected to slow to 4 percent in 2009. With a strengthening of the external environment since the mid-2009, including for diamond prices, the outlook for the Sierra Leonean economy is beginning to improve. Economic activity is projected to gradually recover to 6.5 in 2013 and grow at a steady rate of 5 percent after 2015. Medium to long-term growth is predicated on government's ongoing policies to consolidate macroeconomic stabilization, expand basic public infrastructure, and improve the business environment for private sector development.
- Average annual inflation, as measured by the CPI, is expected to decline from its peak in 2008 of about 15 percent to slightly below 10 percent in 2009 and then gradually to 5 percent by 2015 and 4 percent by 2029. 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 projected to benefit from a projected increase in commodity prices, expansion in mining capacity, and increased investment in agriculture. The new DSA assumes a steeper upward trend in exports than the previous DSA but without attaining the export-to-GDP ratio that was previously anticipated. Total exports are expected to gradually increase from about 16 percent of GDP in 2009 to 31 percent by 2029. Imports of goods and services are projected to gradually increase from about 29 percent in 2009 to 41 percent in 2029.
- On the fiscal side, the planned introduction of a value added tax in January 2010, together with ongoing strengthening and modernization of customs and tax administration is expected to gradually broaden the tax base, raising domestic revenue from 11.4 percent of GDP in 2008 to 13.4 percent in 2013 and gradually to 16 percent by 2029. Current expenditures are projected to remain around 14 percent, while public capital expenditures are expected to increase from 6 percent of GDP in 2008 to 9 percent by 2012 and 11 percent by 2029 in order to address the substantial infrastructure needs of the country. The overall fiscal deficit, including grants, is projected to gradually decrease from 4.8 percent of GDP in 2008 to 2.5 percent by 2029.
- Donor assistance, including grants and concessional loans, is expected to average 10 percent of GDP in 2009-13 and to decline to an annual average of 9 percent in 2014-20 and 8 percent in 2021-29.
- No new debt operation is assumed beyond the buy-back of the external commercial debts that is expected to take place in 2011. It is assumed that about US\$184 million of commercial debt would be eligible for the debt buy-back operation (80 percent of the estimated total) and that 90 percent of that amount would be cancelled. Out of the 10 percent remaining, 75 percent will be covered by external grants and the remaining 25 percent will have to be financed by the budget.
- Domestic debt is expected to decline gradually from 22 percent of GDP in 2008 to 8 percent in 2029 as the government refrains from central bank borrowing and limits issuance of new securities. It is assumed that domestic accumulated arrears to local suppliers and parastatals will be cleared by 2013. 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

6. **Under the baseline scenario, the debt indicators are projected to remain below the corresponding thresholds throughout the entire projection period.**⁵ The PV of debt-to-export ratio is projected to be at its highest level in 2009 as the export sector has been affected by a fall in export prices, particularly for diamond and bauxite and technical difficulties in the production of diamond and rutile. In recent months, however, there have been signs of a pick-up in exports of certain products, including agricultural and diamonds. This starting trend is expected to continue as the global economy recovers, foreign direct investments rebound, and ongoing initiatives to improve agriculture productivity take hold. The PV of external debt to exports is projected to decline from 97.6 percent in 2009 to 77.2 percent in 2019 and 59.8 percent in 2029, thus remaining below the threshold of 100 percent. The PV of debt-to-GDP ratio would remain in the range of 15-19 percent during the entire projection period, thus below the threshold of 30 percent. In addition, the debt service-to exports ratio would stay under 6 percent of exports under the baseline scenario, well below the 15 percent threshold.

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 the alternative scenario that assumes external new borrowing on less concessional terms (A.2), the PV of debt-to-exports ratio exceeds the indicative thresholds during 2012-23.⁶ It would therefore be important to pursue a prudent external debt management policy relying mostly on grants and highly concessional loans.

8. **The use of the new SDR allocation would have an impact on Sierra Leone's debt burden, increasing the PV of external debt to exports above the threshold until 2016.** The combined new allocation for Sierra Leone was SDR82.1 million, equivalent to about 6.6 percent of GDP and 42 percent of exports; therefore the interest obligations associated with the full use of the new allocation could have an important bearing on the country's debt sustainability.⁷ The baseline scenario assumes no use of the new SDR allocation since the authorities have not yet

⁵ Sierra Leone remains rated as a poor performer with regard to its policies and institutions with an average 2006-08 Country Policy and Institutional Assessment (CPIA) rating of 3.10. 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.

⁶ This scenario assumes that the interest rate on new borrowing is 200 basis points higher than in the baseline scenario, while grace and maturity are the same as in the baseline.

⁷ The LIC-DSA projects SDR interest rate to gradually increase from 0.46 percent in 2009 to 3.72 percent in 2013 and to remain at that level thereafter.

decided how and when they will use it. Under an alternative extreme scenario that assumes the total amount of new SDR allocation is used over 2011-15 in equal annual amounts, the PV of external debt to exports would remain above the 100 percent indicative threshold during 2013-16.

9. **The analysis also shows that the debt-to-export ratio is very sensitive to export shocks.** Under the most extreme bound test where the value of exports grows at historical average minus one standard deviation in 2010-11 (B2), the PV of debt-to-exports ratio would reach 174 percent of exports in 2014 and gradually decline to 100 percent in 2028.⁸ The large average deviation to the threshold amounting to about 36 percentage points underlines the vulnerability of the economy to adverse external developments. This calls for strengthening the environment for growth boosting and export expanding policies and programs, including continuing infrastructure investment and financial deepening.

IV. FISCAL DEBT SUSTAINABILITY

A. Baseline

10. **Under the baseline, Sierra Leone's total public debt burden (including domestic debt) is expected to stabilize over the projection period.** The baseline macroeconomic scenario assumes a gradual reduction in domestic bank financing, as a result of the projected fiscal consolidation. With moderate domestic financing, domestic debt is expected to decline from 21 percent of GDP in 2008 to 8 percent by 2029. This trend is offsetting the mild increase in external debt, so that the PV of total public debt-to-GDP ratio would decline from 34 percent of GDP in 2008 to 19 percent in 2029 (Table 3a). While a lower accumulation of domestic debt is a positive outcome, there is still a need to develop a more competitive domestic debt market that could result in lower interest rates and longer maturities.

B. Alternative Scenarios and Stress Tests

11. **A high primary fiscal deficit is the most unfavorable stress test for public debt dynamics.** Under a scenario that assumes the primary fiscal deficit to remain at its 2009 level throughout the projection period, the PV of debt-to-GDP ratio would be the highest among those generated in the three alternative scenarios considered. This underscores the importance of improving domestic revenue mobilization and containing non-priority current expenditures.

V. DEBT DISTRESS CLASSIFICATION AND CONCLUSIONS

12. **Based on the LIC-DSA framework, Sierra Leone remains at a moderate risk of external debt distress.** Under the baseline scenario, all debt indicators are below the indicative country-specific policy dependent thresholds. However, stress tests reveal that Sierra Leone's

⁸ Due to large fluctuations in the economic data following the end of the civil war in 2002, stress tests have been calibrated to use a 5-year historical period.

external debt trajectory is still vulnerable to shocks affecting its external sector. Debt burden indicators rise rapidly above the indicative thresholds in case the growth of exports is below its five year historical average. This illustrates the extent to which 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.

13. **With the public domestic debt projected to decline, the overall assessment does not change once domestic debt is included in the analysis.** A slowdown in domestic debt accumulation would, however, lessen liquidity and the rollover risks associated with the short maturities of domestic debt. Policies should aim, therefore, at promoting the development of the domestic debt market. In addition, the stress test based on a larger primary deficit underlines the importance of improving domestic revenue mobilization and containing non-priority expenditures.

Table 1a.: External Debt Sustainability Framework, Baseline Scenario, 2006-2029 1/
(In percent of GDP, unless otherwise indicated)

	Actual			Standard Deviation	Projections										2015-2029 Average
	Historical		2008		2009-2014										
	Average	2007			2009	2010	2011	2012	2013	2014	Average	2019	2029		
External debt (nominal) 1/	110.4	31.7	32.9		39.3	39.4	28.0	28.8	28.8	29.5	29.5	29.8	29.8	28.9	27.3
o/w public and publicly guaranteed (PPG)	110.4	31.7	32.9		39.3	39.4	28.0	28.8	28.8	29.5	29.5	29.8	29.8	28.9	27.3
Change in external debt	-33.2	-78.7	1.2		6.4	0.1	-11.4	0.8	0.7	0.3	0.3	0.3	0.3	-0.2	-0.3
Identified net debt-creating flows	-16.7	-14.5	4.0		6.9	5.8	4.4	4.4	3.9	3.8	3.8	3.8	3.8	2.9	2.9
Non-interest current account deficit	1.7	3.1	10.4	4.8	9.2	8.4	7.3	7.0	6.6	6.6	6.2	6.2	6.2	5.1	4.9
Deficit in balance of goods and services	7.6	7.0	13.0		12.8	13.0	12.1	11.7	11.3	10.7	10.7	10.7	10.7	9.5	9.6
Exports	24.9	20.8	16.3		15.7	17.9	19.0	19.2	19.4	19.6	19.6	19.6	19.6	23.4	31.0
Imports	32.5	27.8	29.4		28.5	31.0	31.0	30.9	30.7	30.3	30.3	30.3	30.3	32.8	40.6
Net current transfers (negative = inflow)	-8.2	-5.7	-4.4	-8.0	-5.6	-6.5	-6.5	-6.3	-6.2	-5.9	-5.9	-5.9	-5.9	-5.5	-5.5
o/w official	-5.3	-3.5	-2.5		-3.8	-3.7	-3.7	-3.5	-3.4	-2.9	-2.9	-2.9	-2.9	-2.4	-1.8
Other current account flows (negative = net inflow)	2.3	1.8	1.8		1.9	1.8	1.7	1.6	1.5	1.4	1.4	1.4	1.4	1.1	0.8
Net FDI (negative = inflow)	-2.0	-2.0	-2.1		-1.3	-1.3	-1.2	-1.2	-1.2	-1.2	-1.2	-1.2	-1.2	-1.1	-0.9
Endogenous debt dynamics 2/	-16.4	-15.7	-4.4	0.1	-1.0	-1.3	-1.7	-1.3	-1.5	-1.5	-1.5	-1.5	-1.5	-1.1	-1.1
Contribution from nominal interest rate	2.0	0.4	0.4		0.3	0.4	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.2
Contribution from real GDP growth	-9.1	-6.1	-1.5		-1.3	-1.8	-2.0	-1.5	-1.8	-1.5	-1.8	-1.5	-1.8	-1.4	-1.3
Contribution from price and exchange rate changes	-16.5	-64.2	-2.8		...	...	...	...	...	...	...	...	...	...	...
Residual (3-4) 3/ 4/	-10.2	-1.9	1.2		-0.6	-5.7	-15.8	-3.6	-3.2	-3.5	-3.2	-3.5	-3.2	-3.1	-3.2
o/w exceptional financing	...	...	...		-4.5	0.2	-0.5	-0.7	-0.8	-0.7	-0.8	-0.7	-0.8	-0.3	-0.4
PV of external debt 5/	...	...	11.8		15.3	16.0	16.1	16.9	17.6	18.0	18.0	18.0	18.0	18.1	18.5
In percent of exports	...	...	71.9		97.6	89.0	84.9	88.4	90.7	91.6	91.6	91.6	91.6	77.2	59.8
PV of PPG external debt	...	...	11.8		15.3	16.0	16.1	16.9	17.6	18.0	18.0	18.0	18.0	18.1	18.5
In percent of exports	...	...	71.9		97.6	89.0	84.9	88.4	90.7	91.6	91.6	91.6	91.6	77.2	59.8
Debt service-to-exports ratio (in percent)	18.3	7.8	3.3		134.2	137.1	124.7	127.6	130.1	129.4	129.4	129.4	129.4	121.1	112.6
PPG debt service-to-exports ratio (in percent)	18.3	7.8	3.3		4.6	4.7	5.4	4.6	4.3	4.7	4.7	4.7	4.7	4.7	3.5
PPG debt service-to-revenue ratio (in percent)	38.5	14.8	4.8		4.6	4.7	5.4	4.6	4.3	4.7	4.7	4.7	4.7	4.7	3.5
Total gross financing need (Billions of U.S. dollars)	0.3	0.3	0.4		6.3	7.2	8.0	6.7	6.2	6.6	6.6	6.6	6.6	7.4	6.6
Non-interest current account deficit that stabilizes debt ratio	34.9	81.8	9.2		0.4	0.4	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
Key macroeconomic assumptions															
Real GDP growth (in percent)	7.3	6.4	5.5	6.8	4.0	4.7	5.5	6.0	6.5	6.5	6.5	6.5	6.5	5.0	5.0
GDP deflator in US dollar terms (change in percent)	6.9	9.9	11.3	7.3	-4.5	-2.3	3.2	2.4	0.4	0.4	0.4	0.4	0.4	1.7	1.2
Effective interest rate (percent) 6/	1.6	0.4	1.3	1.3	0.9	1.2	0.9	0.9	0.9	0.9	0.9	0.9	0.9	1.0	1.0
Growth of exports of G&S (US dollar terms, in percent)	21.4	-2.6	-7.6	7.4	-4.7	16.9	15.3	9.5	8.4	7.0	7.0	7.0	7.0	10.5	9.0
Growth of imports of G&S (US dollar terms, in percent)	2.3	-0.1	24.2	8.1	15.0	11.0	9.2	7.9	6.5	4.4	4.4	4.4	4.4	8.7	8.5
Grant element of new public sector borrowing (in percent)	11.8	10.9	11.4	...	35.3	41.0	42.1	42.8	42.1	42.9	42.9	42.9	42.9	41.1	38.9
Government revenues (excluding grants, in percent of GDP)	0.1	0.1	0.1	...	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.6
Aid flows (in Billions of US dollars) 8/	0.1	0.1	0.1	...	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
o/w Grants	0.0	0.0	0.1	...	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Grant-equivalent financing (in percent of GDP) 9/	...	...	...	...	73.0	79.8	79.1	79.2	80.3	84.3	84.3	84.3	84.3	83.1	84.0
Grant-equivalent financing (in percent of external financing) 9/	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Memorandum items:															
Nominal GDP (Billions of US dollars)	1.4	1.7	2.0		1.9	2.0	2.2	2.3	2.5	2.5	2.7	2.7	2.7	3.6	6.8
Nominal dollar GDP growth	14.7	17.0	17.5		-0.6	2.2	8.9	8.6	7.0	5.9	5.9	5.9	5.9	6.8	6.3
PV of PPG external debt (in Billions of US dollars)	...	...	0.2		0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.5	0.7	1.3
(PV/(1+r) ^t)/GDPt-1 (in percent)	...	...	...		2.7	1.7	1.6	2.1	1.9	1.4	1.4	1.4	1.4	1.2	1.0

Sources: Country authorities; and staff estimates and projections.

1/ Includes both public and private sector external debt.

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

3/ The large residuals are mostly due to large changes in the stock of external debt generated by MDRI relief obtained in 2006 and 2007 and the expected cancellation of a part of commercial debt in 2011.

4/ 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.

5/ Assumes that PV of private sector debt is equivalent to its face value.

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

7/ Historical averages and standard deviations are derived over the past 5 years. A longer period is not considered due to large fluctuations in the post-conflict economic data.

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

9/ 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.a. Sierra Leone: Sensitivity Analysis for Key Indicators of Public and Publicly Guaranteed External Debt, 2009-2029
(In percent)

	Projections							
	2009	2010	2011	2012	2013	2014	2019	2029
PV of debt-to GDP ratio								
Baseline	15.3	16.0	16.1	16.9	17.6	18.0	18.1	18.5
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2009-2029 1/	15.3	11.3	8.1	6.9	5.9	4.7	2.1	2.3
A2. New public sector loans on less favorable terms in 2009-2029 2/	15.3	16.7	17.8	19.5	20.9	21.9	24.8	28.6
A3. Total new SDR allocation is used over 2011-15 in an equal annual amount	15.3	16.0	17.2	19.0	20.5	21.6	21.3	20.3
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2010-2011	15.3	15.4	15.4	16.2	16.8	17.2	17.5	18.1
B2. Export value growth at historical average minus one standard deviation in 2010-2011 3/	15.3	17.7	21.5	22.0	22.5	22.8	21.6	19.8
B3. US dollar GDP deflator at historical average minus one standard deviation in 2010-2011	15.3	14.7	14.6	15.3	16.0	16.3	16.6	17.2
B4. Net non-debt creating flows at historical average minus one standard deviation in 2010-2011 4/	15.3	16.1	16.5	17.2	17.9	18.2	18.3	18.6
B5. Combination of B1-B4 using one-half standard deviation shocks	15.3	14.6	15.6	16.1	16.7	17.0	16.8	16.7
B6. One-time 30 percent nominal depreciation relative to the baseline in 2010 5/	15.3	22.5	22.7	23.7	24.7	25.3	25.7	26.6
PV of debt-to-exports ratio								
Baseline	97.6	89.0	84.9	88.4	90.7	91.6	77.2	59.8
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2009-2029 1/	97.6	62.9	42.5	36.1	30.3	24.0	8.9	7.3
A2. New public sector loans on less favorable terms in 2009-2029 2/	97.6	93.3	93.9	101.6	107.8	111.8	106.2	92.4
A3. Total new SDR allocation is used over 2011-15 in an equal annual amount	97.6	89.0	90.8	99.2	105.7	110.2	91.3	65.4
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2010-2011	97.6	87.1	82.7	85.8	88.2	89.2	76.1	59.6
B2. Export value growth at historical average minus one standard deviation in 2010-2011 3/	97.6	121.7	170.4	172.4	174.1	174.2	138.6	96.2
B3. US dollar GDP deflator at historical average minus one standard deviation in 2010-2011	97.6	87.1	82.7	85.8	88.2	89.2	76.1	59.6
B4. Net non-debt creating flows at historical average minus one standard deviation in 2010-2011 4/	97.6	89.6	87.1	89.9	92.1	93.0	78.4	60.2
B5. Combination of B1-B4 using one-half standard deviation shocks	97.6	103.6	122.9	126.1	128.7	129.7	107.7	80.7
B6. One-time 30 percent nominal depreciation relative to the baseline in 2010 5/	97.6	87.1	82.7	85.8	88.2	89.2	76.1	59.6
PV of debt-to-revenue ratio								
Baseline	134.2	137.1	124.7	127.6	130.1	129.4	121.1	112.6
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2009-2029 1/	134.2	96.8	62.4	52.1	43.4	34.0	14.0	13.8
A2. New public sector loans on less favorable terms in 2009-2029 2/	134.2	143.6	137.9	146.8	154.6	158.0	166.5	174.2
A3. Total new SDR allocation is used over 2011-15 in an equal annual amount	134.2	137.1	133.4	143.2	151.5	155.7	143.1	123.3
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2010-2011	134.2	132.5	119.5	121.8	124.3	123.9	117.3	110.4
B2. Export value growth at historical average minus one standard deviation in 2010-2011 3/	134.2	151.9	166.7	165.8	166.2	163.9	144.7	120.7
B3. US dollar GDP deflator at historical average minus one standard deviation in 2010-2011	134.2	126.0	113.3	115.5	117.9	117.5	111.3	104.7
B4. Net non-debt creating flows at historical average minus one standard deviation in 2010-2011 4/	134.2	137.9	127.9	129.8	132.0	131.4	122.9	113.5
B5. Combination of B1-B4 using one-half standard deviation shocks	134.2	125.5	120.5	121.6	123.2	122.3	112.8	101.5
B6. One-time 30 percent nominal depreciation relative to the baseline in 2010 5/	134.2	193.6	175.5	178.8	182.5	181.9	172.3	162.1

Table 2 b. Sierra Leone: Sensitivity Analysis for Key Indicators of Public and Publicly Guaranteed External Debt, 2009-2029 (continued)

(In percent)

	2009	2010	2011	2012	2013	2014	2019	2029
Debt service-to-exports ratio								
Baseline	4.6	4.7	5.4	4.6	4.3	4.7	4.7	3.5
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2009-2029 1/	4.6	3.3	3.6	2.7	2.5	2.4	0.9	0.3
A2. New public sector loans on less favorable terms in 2009-2029 2/	4.6	3.6	4.6	4.3	4.6	5.2	5.0	5.6
A3. Total new SDR allocation is used over 2011-15 in an equal annual amount	4.6	4.7	5.4	4.9	4.7	5.2	5.3	3.7
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2010-2011	4.6	3.6	4.4	3.7	3.8	4.1	4.2	3.3
B2. Export value growth at historical average minus one standard deviation in 2010-2011 3/	4.6	4.5	6.8	6.1	6.2	6.6	8.0	5.7
B3. US dollar GDP deflator at historical average minus one standard deviation in 2010-2011	4.6	3.6	4.4	3.7	3.8	4.1	4.2	3.3
B4. Net non-debt creating flows at historical average minus one standard deviation in 2010-2011 4/	4.6	3.6	4.4	3.8	3.8	4.1	4.3	3.4
B5. Combination of B1-B4 using one-half standard deviation shocks	4.6	4.2	5.8	5.1	5.2	5.5	6.0	4.6
B6. One-time 30 percent nominal depreciation relative to the baseline in 2010 5/	4.6	3.6	4.4	3.7	3.8	4.1	4.2	3.3
Debt service-to-revenue ratio								
Baseline	6.3	7.2	8.0	6.7	6.2	6.6	7.4	6.6
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2009-2029 1/	6.3	5.0	5.2	3.9	3.6	3.4	1.4	0.6
A2. New public sector loans on less favorable terms in 2009-2029 2/	6.3	5.6	6.7	6.1	6.6	7.3	7.9	10.6
A3. Total new SDR allocation is used over 2011-15 in an equal annual amount	6.3	7.2	8.0	7.0	6.8	7.4	8.3	7.0
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2010-2011	6.3	5.5	6.3	5.3	5.3	5.6	6.4	6.1
B2. Export value growth at historical average minus one standard deviation in 2010-2011 3/	6.3	5.6	6.6	5.9	5.9	6.2	8.4	7.1
B3. US dollar GDP deflator at historical average minus one standard deviation in 2010-2011	6.3	5.3	6.0	5.0	5.1	5.3	6.1	5.8
B4. Net non-debt creating flows at historical average minus one standard deviation in 2010-2011 4/	6.3	5.6	6.5	5.5	5.5	5.8	6.8	6.3
B5. Combination of B1-B4 using one-half standard deviation shocks	6.3	5.1	5.7	4.9	4.9	5.2	6.3	5.7
B6. One-time 30 percent nominal depreciation relative to the baseline in 2010 5/	6.3	8.1	9.3	7.8	7.8	8.3	9.5	9.0
<i>Memorandum item:</i>								
Grant element assumed on residual financing (i.e., financing required above baseline) 6/	39.1	39.1	39.1	39.1	39.1	39.1	39.1	39.1

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.

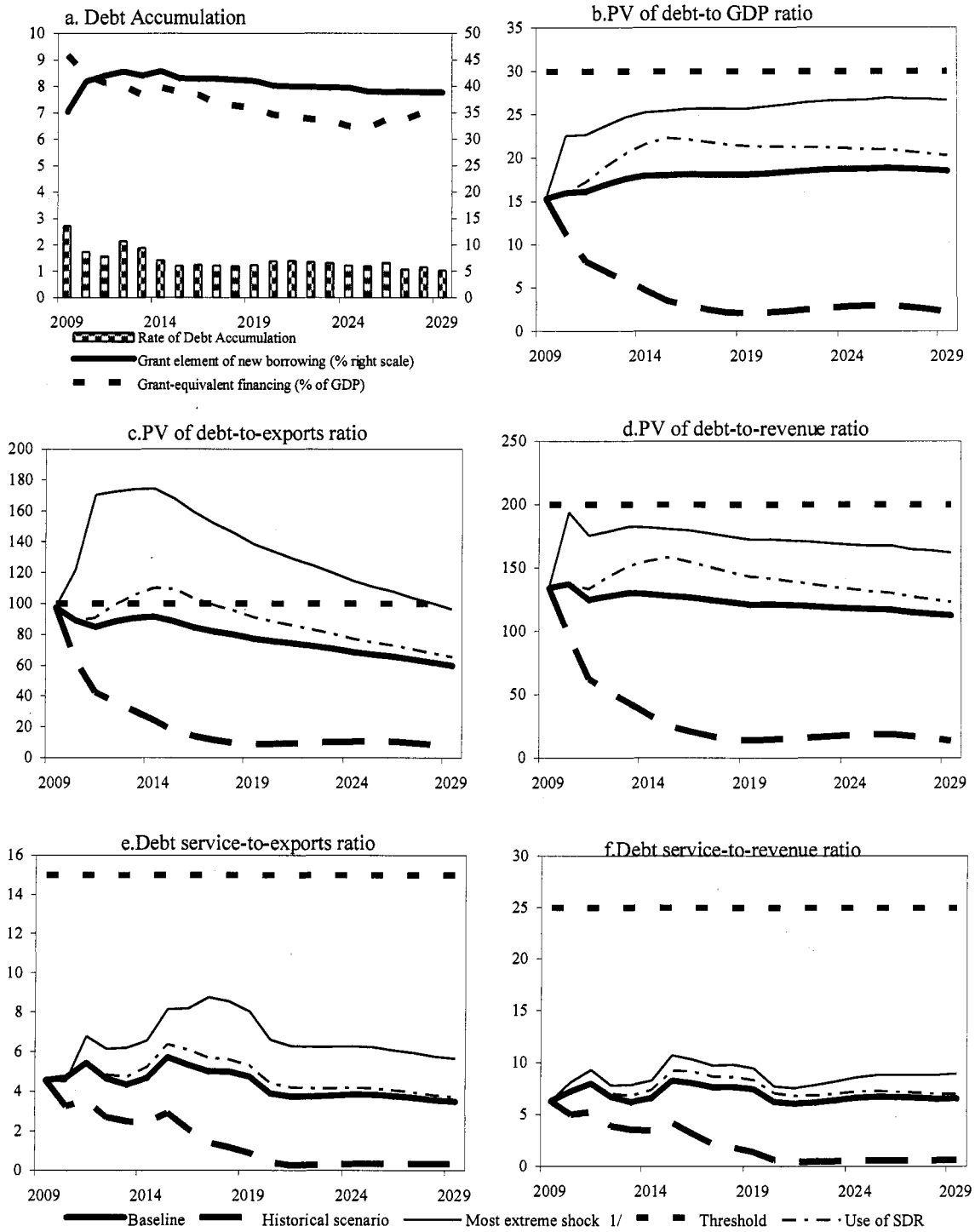
3/ Exports values are assumed to remain permanently at the lower level, but the current account as a share of GDP is assumed to return to its baseline level after the shock (implicitly assuming an offsetting adjustment in import levels).

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.

Figure 1. Sierra Leone: Indicators of Public and Publicly Guaranteed External Debt under Alternatives Scenarios, 2009-2029 1/



Sources: Country authorities; and staff estimates and projections.

1/ The most extreme stress test is the test that yields the highest ratio in 2019. 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

Table 3. a. Sierra Leone: Public Sector Debt Sustainability Framework, Baseline Scenario, 2006-2029
(In percent of GDP, unless otherwise indicated)

	Actual			Estimate							Projections				2015-29	
	2006	2007	2008	Average	Standard Deviation	2009	2010	2011	2012	2013	2014	2014 Average	2019	2029	Average	
Public sector debt 1/	136.8	55.2	53.7			57.8	56.3	42.3	41.0	40.4	39.9	38.8	35.5			
o/w foreign-currency denominated	110.4	31.7	32.9			39.3	39.4	28.0	28.8	29.5	29.8	28.9	27.3			
Change in public sector debt	-37.5	-81.7	-1.5			4.1	-1.5	-13.9	-1.3	-0.6	-0.5	-0.7	-0.2			
Identified debt-creating flows	-22.3	-20.4	-3.2			3.8	-0.5	-1.1	-0.3	-0.1	-0.1	0.0	0.9			
Primary deficit	-1.2	-1.1	-0.7		1.9	2.7	2.3	2.4	1.9	1.7	1.3	2.1	1.3	1.9	1.6	
Revenue and grants	20.1	15.7	16.0			18.7	18.6	19.5	19.7	19.9	20.5	21.1	22.2			
of which: grants	8.2	4.8	4.5			7.3	7.0	6.6	6.4	6.3	6.6	6.1	5.7			
Primary (noninterest) expenditure	18.9	14.6	18.6			21.4	20.9	21.9	21.6	21.6	21.8	22.4	24.1			
Automatic debt dynamics	-20.1	-18.5	-5.6			1.4	-2.7	-3.3	-2.1	-1.7	-1.3	-1.2	-1.0			
Contribution from interest rate/growth differential	-18.7	-17.9	-6.2			-0.1	-0.8	-3.3	-2.3	-1.7	-1.3	-1.2	-1.0			
of which: contribution from average real interest rate	-6.9	-9.6	-3.3			2.0	1.7	-0.4	0.1	0.8	0.8	0.7	0.7			
of which: contribution from real GDP growth	-11.8	-8.3	-2.9			-2.1	-2.6	-2.9	-2.4	-2.5	-2.1	-1.9	-1.7			
Contribution from real exchange rate depreciation	-1.4	-0.6	0.6			1.5	-1.9	0.0	0.1	0.0	0.0	...	...	
Other identified debt-creating flows	-1.1	-0.8	-0.3			-0.4	-0.2	-0.2	-0.2	-0.1	-0.1	-0.1	0.0			
Privatization receipts (negative)	-0.1	-0.1	-0.1			-0.2	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)	-1.0	-0.7	-0.2			-0.2	-0.2	-0.2	-0.2	-0.1	-0.1	-0.1	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	-15.1	-61.2	1.7			0.3	-1.0	-12.9	-0.9	-0.5	-0.4	-0.7	-1.1			
Other Sustainability Indicators																
PV of public sector debt	26.4	23.5	33.7			34.6	33.3	30.7	29.2	28.5	28.1	27.9	26.7			
o/w foreign-currency denominated	0.0	0.0	12.9			16.1	16.5	16.4	17.0	17.6	18.0	18.0	18.5			
o/w external	...	...	11.8			15.3	16.0	16.1	16.9	17.6	18.0	18.0	18.5		
Gross financing need 2/	5.5	2.4	5.1			4.8	4.8	4.8	4.0	3.6	3.1	3.4	3.7			
PV of public sector debt-to-revenue and grants ratio (in percent)	131.5	149.2	211.1			184.7	179.2	157.6	148.3	143.6	136.9	132.6	120.4			
PV of public sector debt-to-revenue ratio (in percent)	222.9	215.0	294.9			303.5	286.4	237.7	220.4	210.6	202.3	187.2	162.4			
o/w external 3/	...	...	102.8			134.2	137.2	124.8	127.7	130.1	129.5	120.7	112.2		
Debt service-to-revenue and grants ratio (in percent) 4/	33.3	22.6	15.1			11.3	13.2	12.2	10.3	9.4	9.1	9.8	8.2			
Debt service-to-revenue ratio (in percent) 4/	56.4	32.6	21.1			18.6	21.1	18.5	15.4	13.8	13.4	13.8	11.1			
Primary deficit that stabilizes the debt-to-GDP ratio	36.3	80.5	4.2			-1.4	3.9	16.4	3.2	2.3	1.8	2.0	2.1			
Key macroeconomic and fiscal assumptions																
Real GDP growth (in percent)	7.3	6.4	5.5	6.8	0.8	4.0	4.7	5.5	6.0	6.5	5.5	5.4	5.0	5.0	5.0	
Average nominal interest rate on forex debt (in percent)	1.6	0.4	1.3	1.3	0.5	0.8	1.1	0.9	0.9	0.9	0.9	0.9	1.0	1.0	1.0	
Average real interest rate on domestic debt (in percent)	-0.7	-2.4	-2.7	-3.4	3.5	0.8	2.4	3.0	4.0	5.8	6.5	3.8	8.6	10.3	9.2	
Real exchange rate depreciation (in percent, + indicates depreciation)	-1.1	-0.6	2.3	-1.3	2.5	4.5	...	...	...	...	...	...	...	...	...
Inflation rate (GDP deflator, in percent)	9.6	10.8	11.2	12.6	3.5	6.3	7.5	6.3	5.5	4.4	4.2	5.7	3.3	2.2	3.0	
Growth of real primary spending (deflated by GDP deflator, in percent)	0.0	-0.2	0.3	0.0	0.2	0.2	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	
Grant element of new external borrowing (in percent)	...	...	...	...	...	35.3	41.0	42.1	42.8	42.1	42.8	41.0	41.0	38.8	...

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 derived over the past 5 years. A longer period is not considered due to large fluctuations in the post-conflict economic data.

Table 3.b.Sierra Leone: Sensitivity Analysis for Key Indicators of Public Debt 2009-2029

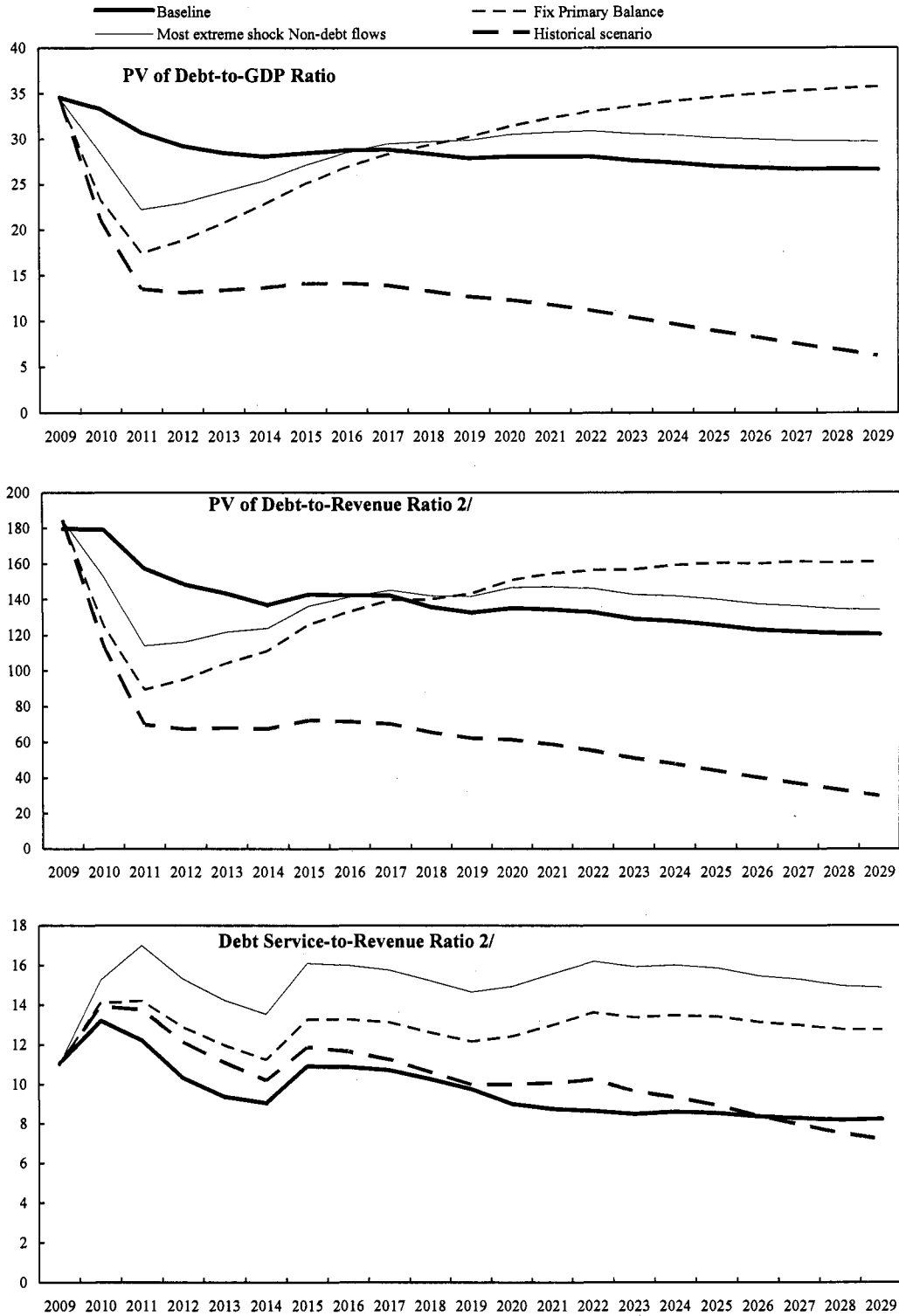
	Projections							
	2009	2010	2011	2012	2013	2014	2019	2029
PV of Debt-to-GDP Ratio								
Baseline	34.6	33.3	30.7	29.2	28.5	28.1	27.9	26.7
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	34.6	21.1	13.5	13.1	13.4	13.7	12.7	6.2
A2. Primary balance is unchanged from 2009	34.6	23.3	17.5	18.8	20.7	22.8	30.2	35.8
A3. Permanently lower GDP growth 1/	34.6	23.2	17.2	18.3	19.8	21.2	27.1	30.8
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2010-2011	34.6	22.8	16.8	17.6	18.9	20.2	24.8	25.4
B2. Primary balance is at historical average minus one standard deviations in 2010-2011	34.6	22.5	15.9	16.9	18.4	19.8	25.1	26.7
B3. Combination of B1-B2 using one half standard deviation shocks	34.6	21.7	14.6	15.5	16.8	18.1	22.6	23.3
B4. One-time 30 percent real depreciation in 2010	34.6	26.0	24.4	24.5	25.4	26.4	29.7	29.0
B5. 10 percent of GDP increase in other debt-creating flows in 2010	34.6	28.5	22.2	22.9	24.2	25.4	29.9	29.7
PV of Debt-to-Revenue Ratio 2/								
Baseline	179.8	179.2	157.6	148.3	143.6	136.9	132.6	120.4
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	184.7	114.1	70.0	67.4	68.1	67.5	62.3	29.9
A2. Primary balance is unchanged from 2009	184.7	125.2	89.6	95.5	104.4	111.3	143.6	161.3
A3. Permanently lower GDP growth 1/	184.7	124.4	88.3	92.5	99.3	103.2	128.0	137.6
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2010-2011	184.7	123.0	86.3	89.7	95.6	98.7	118.1	114.8
B2. Primary balance is at historical average minus one standard deviations in 2010-2011	184.7	121.0	81.7	86.0	92.7	96.5	119.0	120.7
B3. Combination of B1-B2 using one half standard deviation shocks	184.7	117.2	75.5	79.2	85.3	88.6	108.2	105.9
B4. One-time 30 percent real depreciation in 2010	184.7	139.9	125.2	124.5	127.8	128.8	141.3	130.8
B5. 10 percent of GDP increase in other debt-creating flows in 2010	184.7	153.0	114.0	116.3	121.8	124.0	141.9	134.2
Debt Service-to-Revenue Ratio 2/								
Baseline	11.0	13.2	12.2	10.3	9.4	9.1	9.8	8.2
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	11.0	13.9	13.8	12.1	11.1	10.2	10.0	7.2
A2. Primary balance is unchanged from 2009	11.0	14.1	14.2	12.9	12.0	11.2	12.2	12.8
A3. Permanently lower GDP growth 1/	11.0	14.1	14.2	12.9	12.0	11.2	12.0	12.2
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2010-2011	11.0	14.0	14.1	12.7	11.8	11.0	11.7	11.3
B2. Primary balance is at historical average minus one standard deviations in 2010-2011	11.0	14.1	14.1	12.7	11.8	11.0	11.8	11.5
B3. Combination of B1-B2 using one half standard deviation shocks	11.0	14.0	13.9	12.4	11.4	10.7	11.5	10.9
B4. One-time 30 percent real depreciation in 2010	11.0	15.3	17.0	15.3	14.2	13.5	14.7	14.9
B5. 10 percent of GDP increase in other debt-creating flows in 2010	11.0	14.1	14.7	13.7	12.3	11.5	12.1	12.3

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.

Figure 2. Sierra Leone: Indicators of Public Debt Under Alternative Scenarios, 2009-2029 1/



Sources: Country authorities; and staff estimates and projections.

1/ The most extreme stress test is the test that yields the highest ratio in 2019.

2/ Revenues are defined inclusive of grants.