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SIERRA LEONE

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STAFF REPORT FOR THE 2016 ARTICLE IV CONSULTATION AND FIFTH REVIEW UNDER THE EXTENDED CREDIT FACILITY AND FINANCING ASSURANCES REVIEW AND REQUEST FOR AN EXTENSION OF THE EXTENDED CREDIT FACILITY—DEBT SUSTAINABILITY ANALYSIS

Approved By

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Prepared by the International Monetary Fund and the World Bank in collaboration with Sierra Leonese authorities.

This Debt Sustainability Analysis (DSA) updates the analysis presented to the Board in November 2015, and shows that Sierra Leone's risk of debt distress remains moderate. The resumption of iron ore production with related export receipts, as well as the improved fiscal revenue profile somewhat reduced the previously identified vulnerabilities. As in the last DSA update, none of the ratios breach their respective thresholds on a protracted basis throughout the projection period (2016–36).[1] Moreover, the implied borrowing room without breaching the thresholds has also increased. However, the authorities should continue to remain vigilant in their borrowing plans given the uncertainty regarding the viability of iron ore production. The economy continues to remain vulnerable to adverse shocks to exports, FDI and nominal depreciation.

[1] Sierra Leone's capacity to monitor debt is adequate. The average CPIA debt policy rating (3a/3b) is 3.5.

KEY ASSUMPTIONS UNDER THE BASELINE SCENARIO[2]

1. Short term macroeconomic projections are considerably different from the November 2015 update, but the medium term forecast remains broadly unchanged for most macroeconomic indicators (Text Table 1). In 2016, the economy is expected to grow by some 4½ percent, mostly driven by the non-iron ore sectors. The primary deficit will be significantly lower, particularly in the short term, driven by improved revenue profile and iron ore related fiscal revenues as well as by reduced primary spending. However, the external debt as a share of GDP will be higher than the November update due to the more depreciated exchange rate. It is expected to peak in 2016 and gradually decline from then onwards helped by lower current account deficit and higher FDI inflows.

2. The baseline macroeconomic assumptions underlying this DSA update are:

- Economic growth is expected to average 6 percent during 2017–21, mostly driven by the non-iron ore sectors. Compared to the November 2015 update, iron production is forecast to gradually recover. However, the net value added from the iron ore sector will be lower as the cost of production continues to be higher than the current WEO projection of the iron ore price. Over the long term, growth is expected to stabilize close to the historical rates for the non-iron ore economy of around 5.4 percent.

- Inflation is projected to gradually decline over the medium term and stabilize at 5.4 percent in the long term.

- The overall fiscal deficit is projected to be smaller than the November 2015 update in the short term, due to the above-the-line improvements to cope with the new financing realities. It will continue to improve over the medium to long term, with the primary deficit[3] decreasing from around 3.8 percent of GDP in 2015 to 1.5 percent by 2021. It is forecast to ease further to 0.9 percent in the long term, as a result of revenue measures and efforts to strengthen tax administration.

- The current account deficit is forecast to rise slightly from 15½ percent of GDP in 2015 to 16 percent in 2016, and start declining over the medium to long term, consistent with the projected production profile of iron ore and other exports. Compared to the previous DSA, the deterioration in the dynamics of the projected deficit mostly reflects the base effect in 2015. The projected import dynamics broadly reflects the expected overall real GDP growth in the non-iron ore sector. The current account deficit will be financed by rising foreign direct investment (FDI).

[2] All percent figures are with respect to overall GDP.

[3] Including grants.

- FDI is projected to significantly increase from 6 percent of GDP in 2015 to around 12.1 percent in 2016 as most FDI projects halted during Ebola are expected to restart and loss-making production of iron ore is expected to be financed by the parent SISG to maintain the subsidiary's working capital. Most of the improvement is also driven by the recent projects in the agriculture sector. FDI is projected to stabilize at 8 percent in the medium term.

- External debt is projected to increase from 31.6 percent of GDP in 2015 to 34.2 percent in 2016, due to the combination of higher IMF borrowing and more depreciated exchange rate. External debt will still stabilize at around 21 percent of GDP in the long run.

- Domestic debt is projected to rise from 12.2 percent of GDP in 2015, to around 14.6 percent by 2021, mainly reflecting increased domestic borrowing to finance public investment. It will then decline to 8.7 percent of GDP in the long term.

Text Table 1. Selected Economic Indicators, 2015–36

(Percent of GDP, unless otherwise indicated)[1]

	2015	2016	2017	2018	2019	2020	2021	Long Term[2]
Real GDP Growth (in percent)								
Current DSA	-21.1	4.3	5.0	5.8	6.2	6.6	6.5	5.4
Previous DSA	-21.5	0.1	19.6	17.5	6.2	6.3	6.5	5.4
Primary fiscal deficit								
Current DSA	3.8	3.6	1.7	1.3	1.3	1.4	1.5	0.9
Previous DSA	3.7	4.0	2.0	1.9	1.3	1.2	1.2	0.1
Central government revenue								
Current DSA	10.4	10.6	11.7	12.2	12.8	13.4	13.8	16.7
Previous DSA	9.8	10.4	10.4	10.5	10.5	10.6	10.7	11.5
Current account deficit								
Current DSA	15.5	16.0	15.3	14.8	14.7	14.0	14.2	8.0
Previous DSA	13.2	11.9	10.5	7.7	5.8	8.3	7.3	4.4
Foreign direct investment								
Current DSA	6.0	12.1	12.6	12.6	12.7	12.9	13.1	8.3
Previous DSA	7.1	6.7	8.4	7.4	6.6	6.5	6.5	3.5
External debt								
Current DSA	31.6	34.2	32.9	31.5	30.2	28.7	27.0	21.0
Previous DSA	32.0	33.1	30.2	27.9	26.4	25.6	24.1	21.1
Domestic debt								
Current DSA	12.2	14.0	14.4	14.3	14.4	14.4	14.6	8.7
Previous DSA	12.5	15.3	15.0	14.7	15.5	16.2	16.9	18.8

Sources: The Sierra Leone Authorities; and IMF staff projections.

1/ GDP includes iron ore activity.

2/ For the current DSA, the long term covers the period 2022-36, and for the previous DSA it covers the period 2021-35.

EXTERNAL AND PUBLIC DEBT SUSTAINABILITY

A. External Debt Sustainability Analysis

3. **The external DSA indicates that Sierra Leone's debt sustainability remains at moderate risk of debt distress in the baseline scenario**. The dynamics of external debt accumulation is in line with the November 2015 update. The resumption of iron ore production in early 2016 and associated export revenues have improved the PV of debt-to-exports and debt service-to-exports

ratios. Both of these indicators are lower than their respective policy-dependent indicative thresholds throughout the projection period (2016–36). The previously identified vulnerability in the November 2015 update, where the PV of debt-to-exports ratio was close to breaching the threshold in 2016, has now eased. Based on these two ratios, the room to accommodate more borrowing without breaching the respective thresholds has also increased.

4. **Ratios related to fiscal revenues have also improved**. An increased profile of fiscal revenues, due to the resumption of iron ore production and other revenue related measures to close the emerging fiscal gap in 2016, contributed to the improvement of the PV of debt-to-revenue and debt service-to-revenue ratios. This has occurred despite the opposite impact from the more depreciated exchange rate. These two ratios now remain significantly below their respective thresholds both in the short and long term, much better than the November 2015 update. As a result, the vulnerability in Sierra Leone's debt sustainability has improved while the risk of debt distress still remains at the moderate level. Moreover, the implied external borrowing room has also expanded due to more favorable DSA outlook.

5. **However, the current improvement in the debt dynamics remains fragile given, particularly, the peculiar situation in the iron ore sector**. Albeit still moderate, the current rating of the risk of debt distress hinges heavily on the continuation of iron ore-related exports and the realization of fiscal revenue measures agreed upon the completion of the fifth program review. Given the huge uncertainty, particularly, regarding the long-term sustainability of iron ore production in Sierra Leone, previously identified vulnerabilities with respect to export and revenue ratios in the November 2015 update may well resurface in the future. This potential risk calls for continued prudence in the authorities' borrowing policies. The increased borrowing room should not be exhausted but used wisely and sparingly to preserve debt sustainability. Finally, even with this improvement in the debt dynamics, it will be impossible to pursue the expensive construction of Mamamah Airport with nonconcessional external loans.

6. **The external DSA shows that the medium to long term debt outlook remains vulnerable to adverse shocks to several macroeconomic variables**. Shocks from lower exports, decrease in FDI inflows, and nominal currency depreciation could lead to the significant breaches of several thresholds in the short to medium run on a protracted basis. Compared to three ratios in the November 2015 update, four ratios now breach their respective thresholds. Despite all ratios eventually falling below the thresholds in the long run, the realization of an adverse shock may lead to high risk of debt distress.

B. Public Debt Sustainability Analysis

7. **The public DSA improved from the November 2015 update**. In the baseline scenario, both PV ratios decline over the medium to long run from their peak in 2016. This is largely driven by improved revenue and GDP profiles. Similar to the external DSA, debt service-to-revenue ratio rises around 2022 as nearly all external debt is publicly-owned and large repayments come due during this time. The PV of the debt-to-GDP ratio is still below the threshold in the baseline scenario.

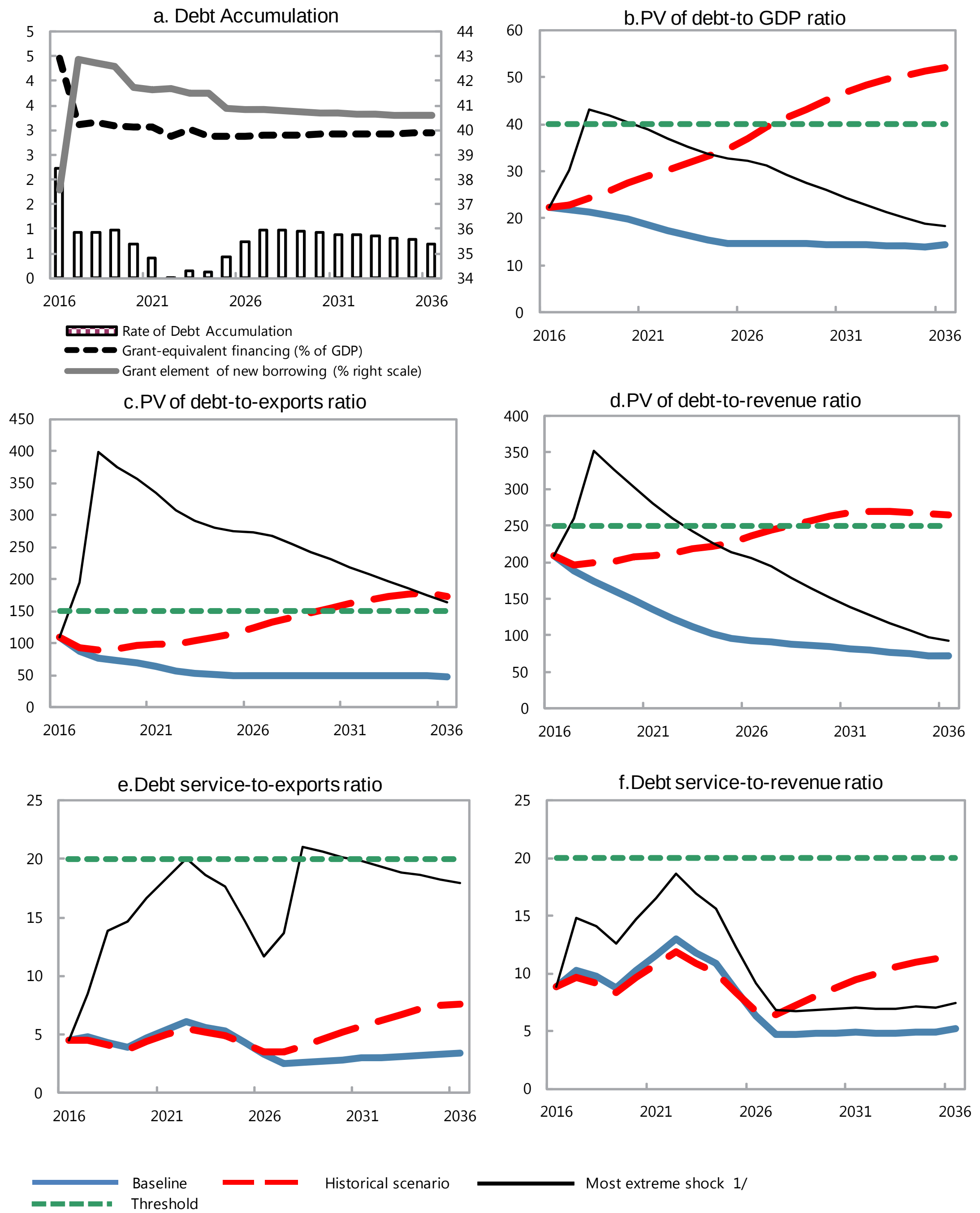
8. In most of the alternative scenarios, most ratios are expected to continue to fall in the long run. If all macroeconomics variables remain at their historic averages, the sustainability of public debt will significantly improve by the end of the forecast horizon, rendering the best outcome. However, if the primary fiscal balance as a share of GDP is kept constant at the 2015 level, all three ratios will be higher than in the baseline by 2036. In the case of PV of debt-to GDP ratio, constant fiscal balance deteriorates the long-term public debt dynamics, while the 30 percent currency depreciation shock prevails in terms of the magnitude of the impact.

9. Authorities broadly agreed with the DSA. They were satisfied with the fact that Sierra Leone's external debt was sustainable in the medium to long term period. Despite the improvement in the debt dynamics, the authorities reiterated their commitment to maintain prudent debt management policies. They also reassured that the borrowing activities would continue to be within the program, aimed at ensuring debt sustainability.

CONCLUSIONS

10. Despite the moderate risk of debt distress, the authorities should remain prudent in their borrowing policies. As the DSA shows, the risk of debt distress continues to be moderate, although the vulnerabilities have somewhat eased due to the resumption of iron ore exports and revenue-enhancing fiscal policy measures. However, the viability of iron ore production remains uncertain, the suspension of which is a major downside risk to the DSA. Furthermore, the economy continues to be highly vulnerable to overall exports and exchange rate depreciation shocks. Therefore, staff reiterates the need for prudent borrowing policies, continued revenue enhancement, sustained fiscal consolidation efforts, continued implementation of growth-enhancing structural reforms, and promotion of economic diversification.

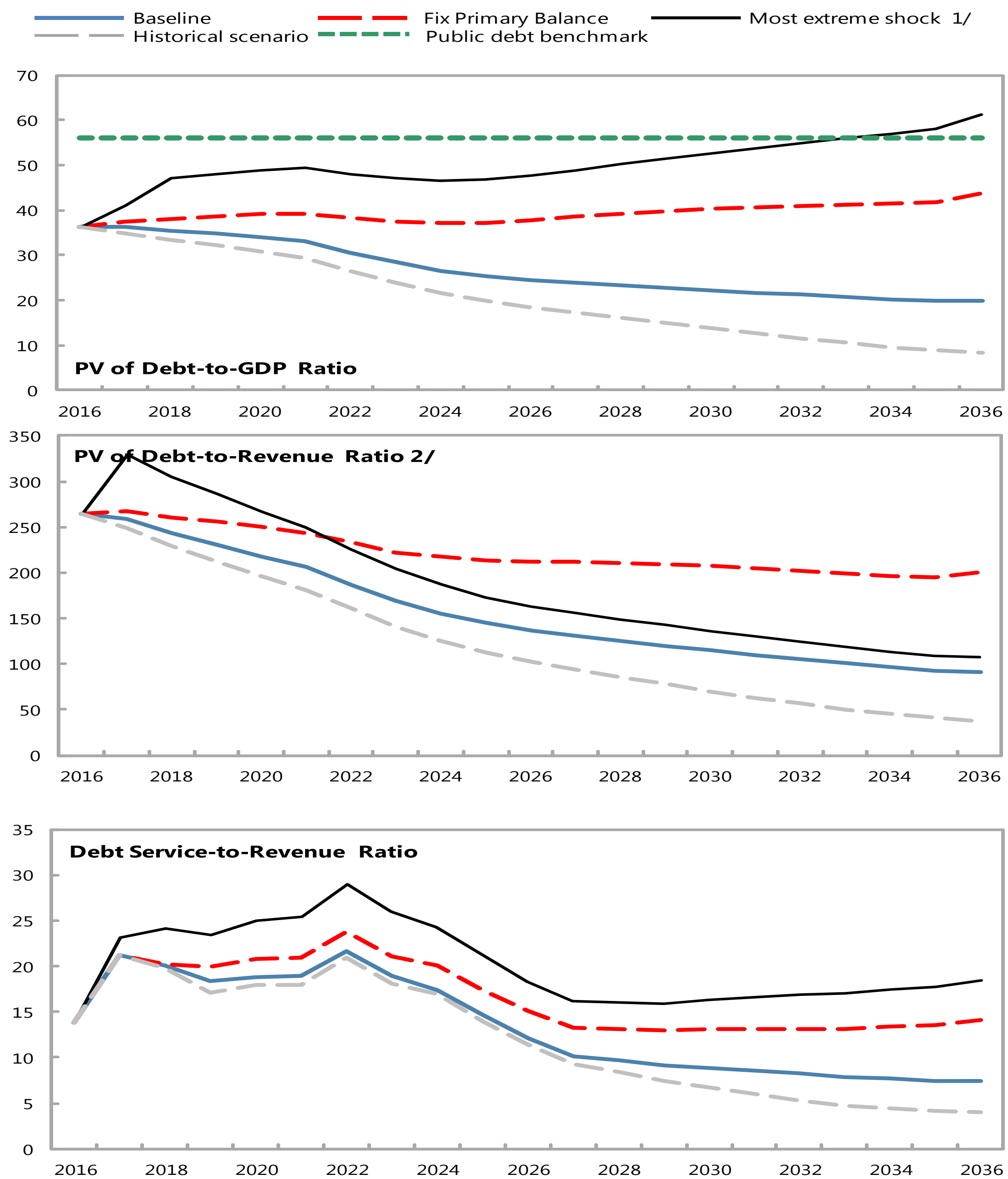
Figure 1. Sierra Leone: Indicators of Public and Publicly Guaranteed External Debt Under Alternative Scenarios, 2016–36[1]



Sources: Country authorities; and staff estimates and projections.

1/ The most extreme stress test is the test that yields the highest ratio on or before 2026. In figure b. it corresponds to a Combination shock; in c. to a Exports shock; in d. to a Combination 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, 2016–36[1]



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

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

(Percent of GDP, unless otherwise indicated)

	Actual			Historical [6/] Average	Standard [6/] Deviation	Projections									
	2013	2014	2015			2016	2017	2018	2019	2020	2021	2016-2021 Average	2026	2036	2022-2036 Average
External debt (nominal) 1/	**21.3**	**24.6**	**31.6**			**34.2**	**32.9**	**31.5**	**30.2**	**28.7**	**27.0**		**21.1**	**19.9**	
of which: public and publicly guaranteed (PPG)	21.3	24.6	31.6			34.2	32.9	31.5	30.2	28.7	27.0		21.1	19.9	
Change in external debt	-4.8	3.3	6.9			2.6	-1.2	-1.4	-1.4	-1.5	-1.7		-0.4	0.6	
Identified net debt-creating flows	4.2	10.1	12.9			2.7	1.1	0.6	0.3	-0.5	-0.4		-1.0	-1.8	
Non-interest current account deficit	**17.5**	**18.2**	**15.5**	**16.9**	**13.1**	**16.0**	**15.3**	**14.8**	**14.7**	**14.0**	**14.2**		**9.8**	**4.9**	8.0
Deficit in balance of goods and services	10.3	27.3	24.2			22.2	19.2	17.7	17.0	16.9	16.5		11.7	7.9	
Exports	35.9	30.2	17.2			20.6	24.9	27.6	28.5	28.8	29.6		29.9	30.0	
Imports	46.2	57.4	41.4			42.8	44.1	45.3	45.5	45.7	46.1		41.6	37.9	
Net current transfers (negative = inflow)	-4.1	-16.6	-11.3	-7.5	3.9	-8.3	-6.3	-5.5	-5.5	-5.4	-5.3		-5.1	-5.3	-5.2
of which: official	-1.0	-14.0	-8.0			-5.4	-3.4	-2.7	-2.7	-2.7	-2.7		-2.6	-3.1	
Other current account flows (negative = net inflow)	11.3	7.5	2.5			2.1	2.4	2.6	3.1	2.6	3.0		3.2	2.3	
Net FDI (negative = inflow)	**-7.3**	**-7.7**	**-6.0**	**-10.1**	**10.4**	**-12.1**	**-12.6**	**-12.6**	**-12.7**	**-12.9**	**-13.1**		**-10.0**	**-5.8**	-8.3
Endogenous debt dynamics 2/	**-5.9**	**-0.4**	**3.4**			**-1.2**	**-1.5**	**-1.6**	**-1.6**	**-1.7**	**-1.6**		**-0.9**	**-0.8**	
Contribution from nominal interest rate	0.0	0.0	0.0			0.2	0.1	0.2	0.2	0.2	0.2		0.2	0.2	
Contribution from real GDP growth	-4.2	-1.0	5.9			-1.4	-1.6	-1.8	-1.8	-1.9	-1.7		-1.0	-1.0	
Contribution from price and exchange rate changes	-1.7	0.6	-2.5			...	...	...	...	...	...		...	...	
Residual (3-4) 3/	**-9.0**	**-6.8**	**-6.0**			**-0.1**	**-2.4**	**-2.0**	**-1.7**	**-1.0**	**-1.2**		**0.6**	**2.4**	
of which: exceptional financing	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
PV of external debt 4/	...	...	20.2			22.3	21.8	21.2	20.5	19.7	18.6		14.4	14.3	
In percent of exports	...	...	117.0			108.1	87.5	76.6	72.0	68.2	62.9		48.3	47.6	
PV of PPG external debt	**...**	**...**	**20.2**			**22.3**	**21.8**	**21.2**	**20.5**	**19.7**	**18.6**		**14.4**	**14.3**	
In percent of exports	**...**	**...**	**117.0**			**108.1**	**87.5**	**76.6**	**72.0**	**68.2**	**62.9**		**48.3**	**47.6**	
In percent of government revenues	**...**	**...**	**193.1**			**209.3**	**186.9**	**172.9**	**159.8**	**147.1**	**134.4**		**92.0**	**72.6**	
Debt service-to-exports ratio (in percent)	**0.0**	**0.0**	**0.0**			**4.5**	**4.8**	**4.3**	**4.0**	**4.7**	**5.4**		**3.2**	**3.4**	
PPG debt service-to-exports ratio (in percent)	**0.0**	**0.0**	**0.0**			**4.5**	**4.8**	**4.3**	**4.0**	**4.7**	**5.4**		**3.2**	**3.4**	
PPG debt service-to-revenue ratio (in percent)	**0.0**	**0.0**	**0.0**			**8.8**	**10.3**	**9.8**	**8.8**	**10.2**	**11.5**		**6.2**	**5.2**	
Total gross financing need (Billions of U.S. dollars)	0.5	0.5	0.4			0.2	0.2	0.2	0.2	0.1	0.2		0.1	0.0	
Non-interest current account deficit that stabilizes debt ratio	22.3	14.9	8.5			13.4	16.5	16.2	16.0	15.6	15.8		10.3	4.3	
Key macroeconomic assumptions															
Real GDP growth (in percent)	20.7	4.6	-21.1	5.2	10.8	4.3	5.0	5.8	6.2	6.6	6.5	5.7	5.2	5.5	5.4
GDP deflator in US dollar terms (change in percent)	7.1	-2.6	11.3	5.6	6.2	-6.7	-1.3	1.1	1.3	1.0	0.9	-0.6	1.5	-3.3	1.2
Effective interest rate (percent) 5/	0.0	0.0	0.0	0.5	0.4	0.6	0.4	0.5	0.6	0.6	0.7	0.6	0.9	1.2	1.0
Growth of exports of G&S (US dollar terms, in percent)	43.7	-14.5	-49.8	17.5	46.0	16.3	25.4	18.7	11.0	9.0	10.2	15.1	5.8	6.7	6.8
Growth of imports of G&S (US dollar terms, in percent)	-8.9	26.7	-36.6	20.8	41.0	0.4	6.9	10.0	8.0	8.2	8.3	7.0	4.6	6.2	5.3
Grant element of new public sector borrowing (in percent)	...	...	...	...	...	38.5	44.5	44.3	44.1	42.7	42.5	42.8	41.2	40.8	41.3
Government revenues (excluding grants, in percent of GDP)	10.7	9.8	10.4			10.6	11.7	12.2	12.8	13.4	13.8		15.7	19.7	16.9
Aid flows (in Billions of US dollars) 7/	0.2	0.3	0.5			0.2	0.2	0.2	0.2	0.2	0.2		0.3	0.6	
of which: Grants	0.1	0.2	0.2			0.1	0.1	0.1	0.1	0.1	0.1		0.2	0.3	
of which: Concessional loans	0.1	0.1	0.2			0.1	0.1	0.1	0.1	0.1	0.1		0.1	0.2	
Grant-equivalent financing (in percent of GDP) 8/	...	...	...			4.5	3.2	3.2	3.1	3.1	3.1		2.9	2.9	2.9
Grant-equivalent financing (in percent of external financing) 8/	...	...	...			66.6	74.9	75.2	74.7	74.1	74.0		74.1	73.9	74.1
Memorandum items:															
Nominal GDP (Billions of US dollars)	4.9	5.0	4.4			4.3	4.4	4.7	5.1	5.5	5.9		8.4	15.6	
Nominal dollar GDP growth	29.3	1.9	-12.2			-2.7	3.6	7.0	7.6	7.7	7.5	5.1	6.8	2.0	6.7
PV of PPG external debt (in Billions of US dollars)			0.8			0.9	0.9	1.0	1.0	1.1	1.1		1.2	2.2	
(PVt-PVt-1)/GDPt-1 (in percent)						2.2	0.9	0.9	0.9	0.7	0.4	1.0	0.8	0.7	0.7
Gross workers' 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)	...	...	20.0			22.0	21.6	20.9	20.3	19.5	18.4		14.3	14.2	
PV of PPG external debt (in percent of exports + remittances)	...	...	110.6			102.9	84.0	74.0	69.7	66.1	61.2		47.3	46.9	
Debt service of PPG external debt (in percent of exports + remittance	...	...	0.0			4.3	4.6	4.2	3.8	4.6	5.2		3.2	3.3	

Sources: Country authorities; and staff estimates and projections.

1/ Includes both public and private sector external debt.

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

3/ Includes exceptional financing (i.e., changes in arrears and debt relief); changes in gross foreign assets; and valuation adjustments. For projections also includes contribution from price and exchange rate changes.

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

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

6/ Historical averages and standard deviations are generally derived over the past 10 years, subject to data availability.

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

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

Table 2. Sierra Leone: Sensitivity Analysis for Key Indicators of Public and Publicly Guaranteed External Debt, 2016–36

(Percent)

	Projections							
	2016	2017	2018	2019	2020	2021	**2026**	2036
PV of debt-to GDP ratio								
Baseline	22	22	21	21	20	19	**15**	14
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2016-2036 1/	22	23	24	26	28	29	**37**	52
A2. New public sector loans on less favorable terms in 2016-2036 2/	22	22	21	21	21	20	**18**	21
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2017-2018	22	23	26	25	24	23	**18**	18
B2. Export value growth at historical average minus one standard deviation in 2017-2018 3/	22	27	38	37	35	34	**28**	17
B3. US dollar GDP deflator at historical average minus one standard deviation in 2017-2018	22	21	21	20	19	18	**14**	14
B4. Net non-debt creating flows at historical average minus one standard deviation in 2017-2018 4/	22	30	39	37	36	35	**29**	17
B5. Combination of B1-B4 using one-half standard deviation shocks	22	30	43	42	40	39	**32**	18
B6. One-time 30 percent nominal depreciation relative to the baseline in 2017 5/	22	30	30	29	28	26	**21**	20
PV of debt-to-exports ratio								
Baseline	108	88	77	72	69	63	**49**	48
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2016-2036 1/	108	92	88	91	96	98	**124**	173
A2. New public sector loans on less favorable terms in 2016-2036 2/	108	87	78	75	73	69	**61**	69
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2017-2018	108	85	74	70	67	62	**48**	47
B2. Export value growth at historical average minus one standard deviation in 2017-2018 3/	108	194	397	374	356	334	**272**	164
B3. US dollar GDP deflator at historical average minus one standard deviation in 2017-2018	108	85	74	70	67	62	**48**	47
B4. Net non-debt creating flows at historical average minus one standard deviation in 2017-2018 4/	108	122	140	132	125	117	**96**	56
B5. Combination of B1-B4 using one-half standard deviation shocks	108	159	246	232	221	207	**169**	96
B6. One-time 30 percent nominal depreciation relative to the baseline in 2017 5/	108	85	74	70	67	62	**48**	47
PV of debt-to-revenue ratio								
Baseline	210	187	174	161	148	135	**93**	73
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2016-2036 1/	210	197	199	202	207	209	**236**	264
A2. New public sector loans on less favorable terms in 2016-2036 2/	210	185	175	166	157	147	**115**	105
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2017-2018	210	201	210	195	180	165	**114**	89
B2. Export value growth at historical average minus one standard deviation in 2017-2018 3/	210	236	308	285	264	245	**178**	86
B3. US dollar GDP deflator at historical average minus one standard deviation in 2017-2018	210	180	170	158	146	134	**92**	72
B4. Net non-debt creating flows at historical average minus one standard deviation in 2017-2018 4/	210	261	315	292	271	251	**182**	86
B5. Combination of B1-B4 using one-half standard deviation shocks	210	260	353	327	303	281	**205**	93
B6. One-time 30 percent nominal depreciation relative to the baseline in 2017 5/	210	260	242	224	207	190	**131**	103

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

(Percent)

				Debt service-to-exports ratio				
Baseline	5	5	4	4	5	5	**3**	3
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2016-2036 1/	5	4	4	4	4	5	**4**	8
A2. New public sector loans on less favorable terms in 2016-2036 2/	5	5	4	4	5	6	**4**	5
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2017-2018	5	5	4	4	5	5	**3**	3
B2. Export value growth at historical average minus one standard deviation in 2017-2018 3/	5	8	14	15	17	18	**12**	18
B3. US dollar GDP deflator at historical average minus one standard deviation in 2017-2018	5	5	4	4	5	5	**3**	3
B4. Net non-debt creating flows at historical average minus one standard deviation in 2017-2018 4/	5	5	5	5	6	6	**4**	6
B5. Combination of B1-B4 using one-half standard deviation shocks	5	6	8	9	10	11	**7**	11
B6. One-time 30 percent nominal depreciation relative to the baseline in 2017 5/	5	5	4	4	5	5	**3**	3
				Debt service-to-revenue ratio				
Baseline	9	10	10	9	10	12	**6**	5
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2016-2036 1/	9	10	9	8	10	11	**7**	12
A2. New public sector loans on less favorable terms in 2016-2036 2/	9	10	10	9	11	12	**7**	7
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2017-2018	9	11	12	11	13	14	**8**	6
B2. Export value growth at historical average minus one standard deviation in 2017-2018 3/	9	10	11	11	12	13	**8**	9
B3. US dollar GDP deflator at historical average minus one standard deviation in 2017-2018	9	10	10	9	10	12	**6**	5
B4. Net non-debt creating flows at historical average minus one standard deviation in 2017-2018 4/	9	10	11	11	12	14	**8**	10
B5. Combination of B1-B4 using one-half standard deviation shocks	9	10	12	12	13	15	**8**	11
B6. One-time 30 percent nominal depreciation relative to the baseline in 2017 5/	9	15	14	13	15	17	**9**	7
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, 2016–36

(Percent of GDP, unless otherwise indicated)

	Actual			Average 5/	Standard Deviation 5/	Estimate	Projections								
	2013	2014	2015			2016	2017	2018	2019	2020	2021	2016-21 Average	2026	2036	2022-36 Average
Public sector debt 1/	30.5	35.0	43.8			48.2	47.3	45.9	44.5	43.1	41.6		31.1	25.5	
of which: foreign-currency denominated	21.3	24.6	31.6			34.2	32.9	31.5	30.2	28.7	27.0		21.1	19.9	
Change in public sector debt	-6.2	4.4	8.8			4.4	-0.9	-1.4	-1.4	-1.5	-1.5		-1.1	0.3	
Identified debt-creating flows	-5.7	5.0	8.9			2.6	-0.2	-0.9	-1.0	-0.9	-0.6		-0.3	0.8	
Primary deficit	0.4	2.9	3.8	-0.4	7.7	3.6	1.7	1.3	1.3	1.4	1.5	1.8	0.7	0.6	0.9
Revenue and grants	13.3	14.0	15.7			13.7	14.0	14.6	15.1	15.6	16.1		17.9	21.9	
of which: grants	2.6	4.2	5.2			3.1	2.3	2.4	2.3	2.3	2.3		2.2	2.2	
Primary (noninterest) expenditure	13.6	16.9	19.4			17.3	15.7	15.8	16.4	17.0	17.6		18.5	22.5	
Automatic debt dynamics	-6.0	2.3	5.1			-1.0	-2.0	-2.2	-2.3	-2.2	-2.1		-1.0	0.1	
Contribution from interest rate/growth differential	-5.0	-0.5	7.6			-2.1	-1.9	-2.4	-2.4	-2.5	-2.3		-0.7	-0.5	
of which: contribution from average real interest rate	1.3	0.9	-1.8			-0.3	0.4	0.2	0.2	0.3	0.3		0.9	0.8	
of which: contribution from real GDP growth	-6.3	-1.3	9.3			-1.8	-2.3	-2.6	-2.7	-2.8	-2.6		-1.6	-1.3	
Contribution from real exchange rate depreciation	-1.0	2.8	-2.4			1.1	0.0	0.2	0.2	0.2	0.2		...	...	
Other identified debt-creating flows	-0.1	-0.2	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Privatization receipts (negative)	-0.1	-0.1	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Recognition of implicit or contingent liabilities	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Debt relief (HIPC and other)	0.0	-0.1	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Other (specify, e.g. bank recapitalization)	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Residual, including asset changes	-0.5	-0.6	-0.1			1.8	-0.6	-0.5	-0.4	-0.6	-0.9		-0.8	-0.5	
Other Sustainability Indicators															
PV of public sector debt	...	...	32.3			36.3	36.1	35.5	34.9	34.1	33.1		24.4	19.9	
of which: foreign-currency denominated	...	...	20.2			22.3	21.8	21.2	20.5	19.7	18.6		14.4	14.3	
of which: external	...	...	20.2			22.3	21.8	21.2	20.5	19.7	18.6		14.4	14.3	
PV of contingent liabilities (not included in public sector debt)	...	...	...			...	...	...	...	...	...		...	...	
Gross financing need 2/	1.6	3.7	4.4			5.5	4.7	4.2	4.1	4.3	4.6		2.8	2.3	
PV of public sector debt-to-revenue and grants ratio (in percent)	...	...	206.7			264.4	258.9	243.3	230.7	217.7	205.7		136.7	90.7	
PV of public sector debt-to-revenue ratio (in percent)	...	...	309.9			341.0	310.2	290.1	271.7	254.9	239.7		155.7	101.0	
of which: external 3/	...	...	193.1			209.3	186.9	172.9	159.8	147.1	134.4		92.0	72.6	
Debt service-to-revenue and grants ratio (in percent) 4/	9.4	5.7	3.9			13.9	21.2	20.0	18.4	18.8	18.9		12.1	7.4	
Debt service-to-revenue ratio (in percent) 4/	11.7	8.2	5.8			17.9	25.4	23.9	21.6	22.1	22.1		13.8	8.3	
Primary deficit that stabilizes the debt-to-GDP ratio	6.6	-1.6	-5.0			-0.8	2.6	2.7	2.7	2.8	3.0		1.8	0.4	
Key macroeconomic and fiscal assumptions															
Real GDP growth (in percent)	20.7	4.6	-21.1	5.2	10.8	4.3	5.0	5.8	6.2	6.6	6.5	5.7	5.2	5.5	5.4
Average nominal interest rate on forex debt (in percent)	0.0	0.0	0.0	0.6	0.6	0.6	0.4	0.5	0.6	0.6	0.7	0.6	0.9	1.2	1.0
Average real interest rate on domestic debt (in percent)	7.8	7.3	-15.2	-0.5	6.8	-1.5	5.0	5.1	5.0	5.3	5.1	4.0	7.0	10.8	7.0
Real exchange rate depreciation (in percent, + indicates depreciation	-4.5	13.5	-7.8	-2.1	9.8	3.7	...	...	...	...	...	...	...	...	...
Inflation rate (GDP deflator, in percent)	6.9	1.8	24.7	11.7	6.6	10.8	8.9	8.2	7.7	6.9	6.0	8.1	5.0	0.1	4.7
Growth of real primary spending (deflated by GDP deflator, in percer	-11.8	29.7	-9.2	1.0	11.0	-7.0	-5.0	6.9	10.1	10.4	10.4	4.3	7.1	6.4	7.2
Grant element of new external borrowing (in percent)	...	...	...	...	...	38.5	44.5	44.3	44.1	42.7	42.5	42.8	41.2	40.8	...

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 generally derived over the past 10 years, subject to data availability.

Table 4. Sierra Leone: Sensitivity Analysis for Key Indicators of Public Debt, 2016–36

	Projections							
	2016	2017	2018	2019	2020	2021	2026	2036
PV of Debt-to-GDP Ratio								
Baseline	36	36	36	35	34	33	24	20
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	36	35	33	32	31	29	18	8
A2. Primary balance is unchanged from 2016	36	37	38	39	39	39	38	44
A3. Permanently lower GDP growth 1/	36	37	38	38	39	40	42	88
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2017-20	36	41	47	48	49	49	48	61
B2. Primary balance is at historical average minus one standard deviations in 2017-201	36	40	43	41	40	39	30	23
B3. Combination of B1-B2 using one half standard deviation shocks	36	39	42	42	42	42	36	40
B4. One-time 30 percent real depreciation in 2017	36	46	45	43	42	40	29	23
B5. 10 percent of GDP increase in other debt-creating flows in 2017	36	42	41	40	39	38	29	23
PV of Debt-to-Revenue Ratio 2/								
Baseline	264	259	243	231	218	206	137	91
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	264	249	229	213	197	181	102	37
A2. Primary balance is unchanged from 2016	264	267	261	256	250	243	212	200
A3. Permanently lower GDP growth 1/	264	265	256	251	246	243	228	379
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2017-20	264	288	310	306	301	296	259	273
B2. Primary balance is at historical average minus one standard deviations in 2017-201	264	283	292	275	258	243	166	105
B3. Combination of B1-B2 using one half standard deviation shocks	264	277	282	273	263	254	199	179
B4. One-time 30 percent real depreciation in 2017	264	330	306	286	267	249	163	107
B5. 10 percent of GDP increase in other debt-creating flows in 2017	264	302	284	267	251	237	162	103
Debt Service-to-Revenue Ratio 2/								
Baseline	14	21	20	18	19	19	12	7
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	14	21	20	17	18	18	11	4
A2. Primary balance is unchanged from 2016	14	21	20	20	21	21	15	14
A3. Permanently lower GDP growth 1/	14	22	21	20	21	22	17	23
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2017-20	14	23	24	23	25	25	18	18
B2. Primary balance is at historical average minus one standard deviations in 2017-201	14	21	21	23	23	20	13	9
B3. Combination of B1-B2 using one half standard deviation shocks	14	22	22	22	22	22	15	13
B4. One-time 30 percent real depreciation in 2017	14	23	24	22	23	24	15	11
B5. 10 percent of GDP increase in other debt-creating flows in 2017	14	21	21	25	20	20	13	9

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.