INTERNATIONAL DEVELOPMENT ASSOCIATION AND
INTERNATIONAL MONETARY FUND

LIBERIA

Joint World Bank/IMF Debt Sustainability Analysis

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

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April 22, 2009

This update of the external low-income country debt sustainability analysis (LIC DSA) indicates that Liberia remains in debt distress in the baseline scenario.[1]*/*[2]*/ Under the alternative scenario, which assumes full delivery of HIPC, MDRI and IMF beyond-HIPC*[3] *debt relief at completion point, debt dynamics are below the relevant policy-dependent indicative thresholds, assuming moderate new borrowing on concessional terms, and robust GDP growth. The inclusion of public domestic debt in the analysis does not significantly change the overall assessment of Liberia's debt sustainability.*

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[1] These DSAs have been produced jointly by the World Bank and Fund staffs. Liberia's fiscal year runs from July to June.

[2] Liberia will be rated under the World Bank's Country Policy and Institutional Assessment (CPIA) by June 2009. For the purposes of this analysis, the staff's have assumed a weak policy rating without prejudicing the upcoming CPIA assessment). Accordingly, the corresponding indicative thresholds for the external LIC DSA are 30 percent for the NPV of debt-to-GDP ratio, 100 percent for the NPV of debt-to-exports ratio, and 15 percent for the debt service-to-exports ratio. See "Operational Framework for Debt Sustainability Assessments in Low-Income Countries—Further Considerations" (http://www.imf.org/External/np/pp/eng/2005/032805.htm, 3/28/05) and "Applying the Debt Sustainability Framework for Low-Income Countries Post Debt Relief" (www.imf.org, 11/6/06).

[3] Liberia's debt to the IMF under the 3-year PRGF/EFF will not be covered by MDRI since it was contracted after the end-2004 MDRI cutoff date. "Beyond-HIPC" debt relief refers to the assistance necessary to reduce the value of the stock of qualifying debt to zero.

A. Introduction

1. **This joint DSA was prepared using the Fund-World Bank debt sustainability framework for low-income countries approved by the respective Executive Boards with some modifications to the stress tests to address data limitations in Liberia.**[4] It presents the projected path of Liberia's external and public debt indicators and draws conclusions on the forward-looking sustainability of debt under baseline and alternative scenarios for debt relief and macroeconomic developments. The macroeconomic framework data were updated by Fund and World Bank staff following discussions with the authorities in February 2008. The base year debt stock and debt service data reflect data used at the decision point with updates for interim assistance from multilateral creditors.

2. **Three changes to the baseline scenario explain the differences between the current analysis and the previous DSA at the HIPC decision point in March 2008**: (i) the path of GDP and export growth has been modified to reflect a delay in the recovery of Liberia's exports and foreign direct investment resulting from the ongoing global recession but with higher long-term iron ore exports on the basis of investment agreements (ii) the balance of payments data for services are revised upwards reflecting new estimates of receipts and payments; and (iii) government domestic debt owed to the Central Bank of Liberia (CBL) was excluded from the analysis to bring the public DSA in line with the definition of public sector. The macroeconomic impact of the iron ore sector is substantial as indicated in comparisons of debt indicators in relation non-iron ore GDP (Figure 1).

B. Baseline Scenario

3. The baseline scenario draws historical data from the previous DSA and projections from macro-economic framework underpinning the second review of Liberia's PRGF arrangement. Average real GDP growth over 2007/08–2012/13 is projected at 9.0 percent, spurred by FDI-financed projects in the mining, forestry, and agriculture sectors and more broadly normalization of economic activities resulting from improved security. Over the longer run, real growth is projected to moderate to 5.5 percent declining to 3.5 percent by the end of the projection period, as the growth of FDI-related output diminishes. Projected growth remains above the pre-conflict average growth rate of 3.0 percent in the early projection period due to the catch-up effect seen in post conflict countries and historically large flows of FDI. Inflation rate measured by GDP deflator (US dollar terms) is projected to increase at an average of 2.8 percent over 2007/08–2012/13 and at 1.9 percent during 2017/18-2027/28.

[4] The historical averages for the stress tests are the same as used in the decision point DSA.

4. Liberia is assumed to have limited recourse to public sector borrowing over the long-term. The DSA assumes that the cash-based balanced budget is maintained to the completion point at end-2009/10. Starting 2010/11, borrowing commences at a rate of 2 percent of GDP per year, predominantly from external concessional sources. Grants are expected to be the main source of external financing post HIPC completion point, reflecting Liberia's low income per capita.[5] From 2015/16, as revenues are boosted by substantial iron ore royalty payments, borrowing drops to 1½ percent of GDP including a net repayment of outstanding domestic debt.

5. The revenue-to-GDP ratio increases in the short term on account of timber-related revenue and in the medium to long term from taxes and royalties on iron ore mining. The revenue projections are based on two large iron ore projects; in one, the concession agreement has been ratified by the legislature; and in the other rehabilitation of mining facilities is underway.

6. **The external position is expected to improve gradually with continued donor support and increasing FDI over the medium term**. Nonetheless, the baseline scenario indicates a significant deterioration of the debt ratios in the first few years compared to the last DSA. This is largely due to the impact of the global crisis on FDI and exports in the period through 2012. The non-interest current account deficit is projected to decline from 38 percent of GDP in 2008/09 to about 7 percent of GDP by 2012/13 as iron ore exports come on stream and further improving to average surplus 1 percent of GDP during 2013/14-2026/27. The counterpart to the improving current account is higher private sector savings assumed to result from rising incomes and development of the financial system. Donor transfers are projected to decline in the medium term, coinciding with the eventual drawdown of the UNMIL mission but would remain above 20 percent GDP over the projection period.

7. **The baseline scenario assumes full delivery of traditional debt relief, multilateral arrears clearance and interim HIPC assistance**. In addition, a financing gap is assumed to be met through additional voluntary interim period assistance beyond HIPC Initiative relief. Consistent with LIC DSA guidelines, the baseline does not reflect the delivery of HIPC, MDRI and IMF beyond-HIPC assistance at the completion point; however, this is presented in an alternative scenario with debt stock declining to about U$262 million (text table).

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[5] The decision point DSA assumed borrowing equivalent to 3 percent of GDP after the completion point. The reduction of borrowing in the DSA update is a reflection of higher revenue projections reflecting iron ore royalties.

Liberia External Debt Profile US$ Millions	Jun-07	Dec-08	Feb-09	**2011***
Multilateral creditors	1619.2	1052.1	1052.1	162.6
Bilateral Paris Club	1459.8	725	608.4	43.91
Bilateral Non-Paris Club	129.8	119.5	119.5	10.13
Commercial	1686.3	1233.8	1233.8	45.22
Total	4895.1	3130.4	3013.8	261.86

Source: http://www.mofliberia.org/externaldebt.htm, 04/02/2009

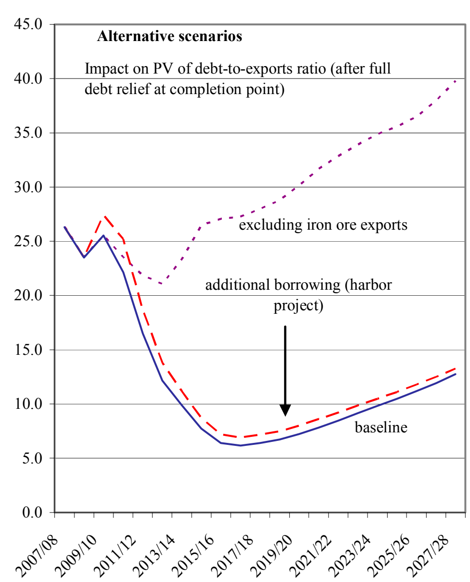
*Staff estimates of debt stock (nominal) after completion point.

C. Debt Sustainability Analysis

External Debt Sustainability

8. **The baseline scenario indicates that Liberia is in debt distress**. With exception of debt-service-to exports ratio, all key debt indicators are well above their policy-dependent indicative thresholds in the baseline scenario (Table 1a, Figure 2). With export growth, the PV of external debt-to-export ratio is expected to fall below the threshold by 2014/15, while the PV of external debt-to-revenue moves below the 200 percent threshold by 20186/17 reflecting the impact of iron ore production royalties on revenue. The ratios of debt service to exports and to revenue rise substantially in the period 2011-18 mainly on account of debt service related to Fund EFF and PRGF credit.

9. **The alternative scenarios and bound tests reveal significant underlying vulnerabilities and highlight the continuing importance of debt relief** (Table 1b). Because of a history of volatile economic indicators the bound tests represent large shocks to the baseline scenario. The tests based on slower export growth, lower non-debt creating flows and combined shocks result in the most significant deterioration of debt ratios, highlighting the potential vulnerability to reversals in FDI and exports. However, assuming that new borrowing is moderate and highly concessional terms, the impact of borrowing is less severe. The historical scenario results should be interpreted with caution owing the paucity of historical data.



10. **Debt relief through the HIPC Initiative, MDRI and IMF beyond-HIPC assistance would significantly improve Liberia's debt situation** (Figure 3). Assuming the full delivery of such assistance at end 2009/10, all three debt-burden indicators (PV of debt-to-GDP ratio, PV of debt-to-exports ratio, and debt service-to-exports ratio) would be significantly below their indicative thresholds. An alternative scenario factoring in modest concessional borrowing pre-completion point shows a minimal

impact on ensuing debt ratios (see text chart). This result is also robust to a scenario that assumes no iron ore exports.

Public Sector Debt Sustainability

11. **Under the baseline scenario, Liberia's public debt as a share of GDP is** expected **to decline throughout the projection period though remaining at high levels through to the end of the projection period absent debt relief** (Table 2a, Figure 4). The steady decline in the debt-to-GDP ratio is due to strong GDP growth early in the projection period and a near zero primary balance after the completion point. In the outer years, GDP growth of 3 percent is strong enough to continue contributing to the decline in the ratio.

12. **Domestic public debt is modest and largely owed to the banking sector and does not play a major role in public debt dynamics.** New public sector domestic borrowing, assumed to commence after the completion point is modest and mostly incurred in relation to repaying outstanding government debt to the central bank.[6]

13. **Sensitivity tests suggest that the trajectory of Liberia's total public debt is particularly sensitive to shocks on the real exchange rate and GDP growth** (Table 2b). Although the one-time 30 percent depreciation shock in 2008/09 (bound test B4) has a large adverse impact on debt dynamics, however this shock could be somewhat muted, given that the Liberian economy is highly dollarized and its debt is predominantly denominated in US dollars.

D. Staff Assessment

14. **The staffs assess Liberia to be in debt distress. Under the baseline scenario, external debt burden indicators remain well above their indicative thresholds** absent full delivery of debt relief through HIPC Initiative, MDRI and IMF beyond-HIPC assistance at HIPC completion point. Such debt relief would significantly improve Liberia's external debt situation and bring Liberia's debt indicators to a manageable level.

15. **Alternative scenarios and bound tests indicate that modest concessional borrowing pre-completion point would have minimal impact on Liberia's debt indicators post-completion point**. However, the achievement of a robust external debt position will depend on continued maintenance of peace, conducive economic environment that sustains real GDP growth above 5 percent as well as prudent fiscal policy and debt management. The inclusion of domestic debt in the analysis does not significantly change the overall assessment of Liberia's debt sustainability.

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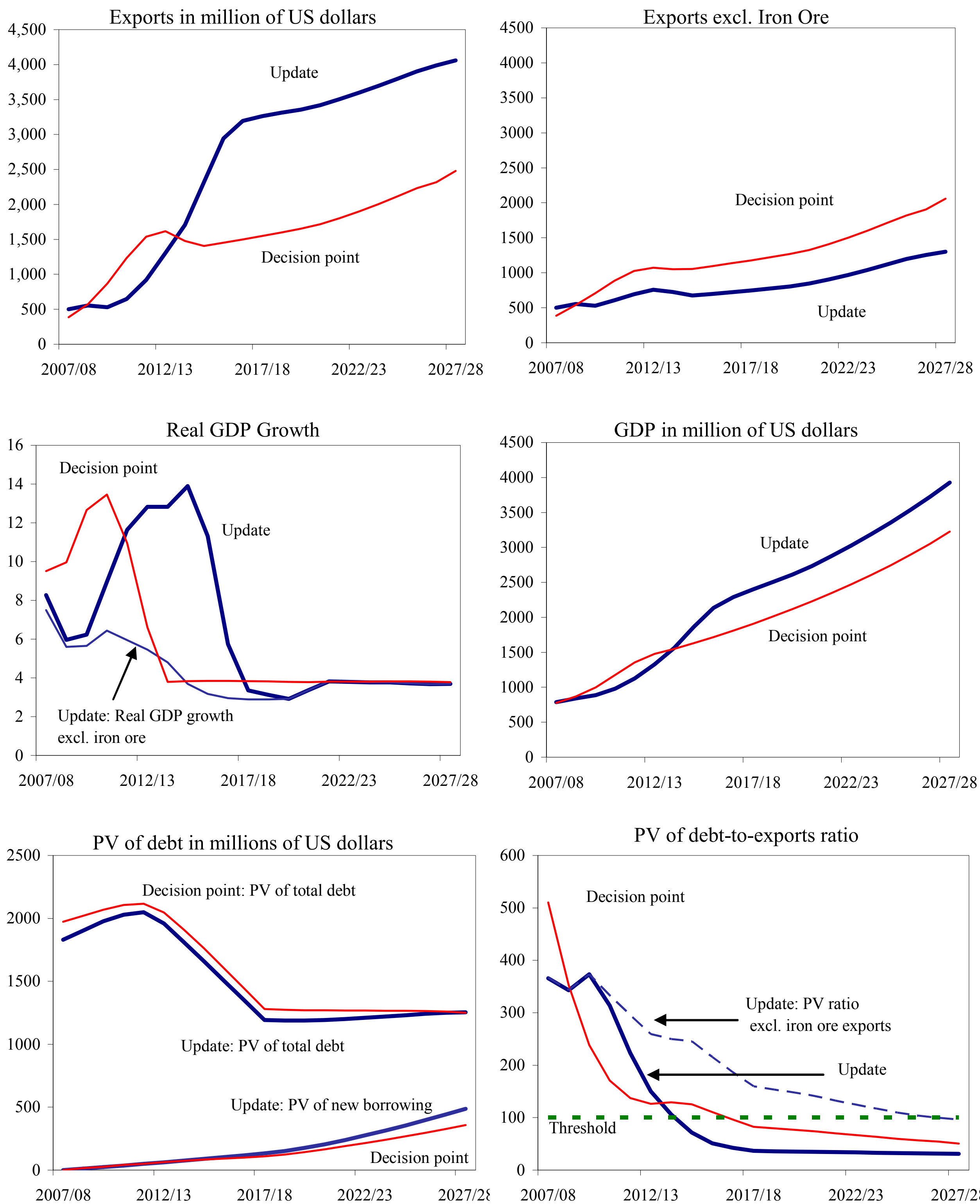
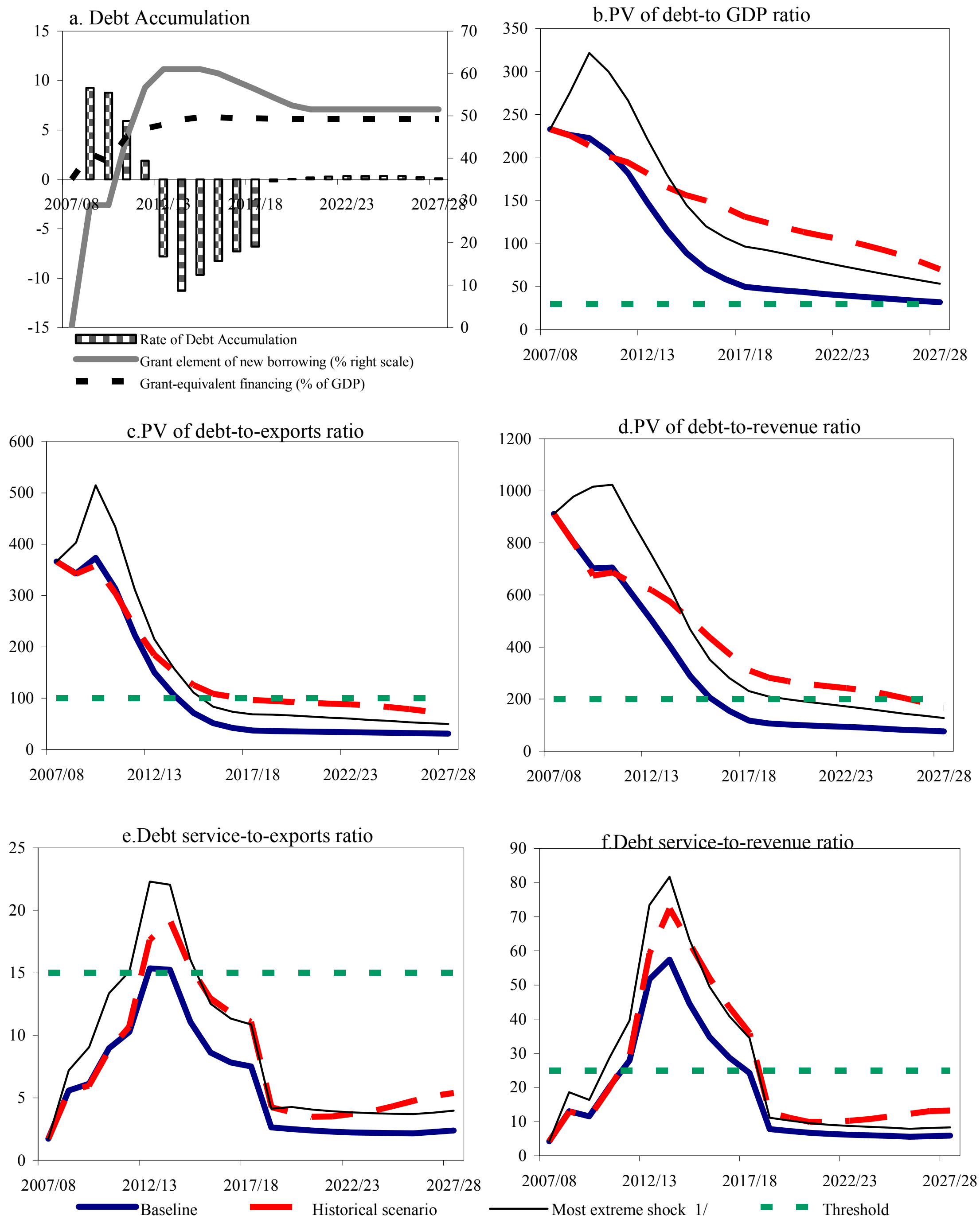
[6] 90 percent of gross domestic debt is government debt to the Central Bank of Liberia.

Figure 1. Liberia: Comparison to Decision Point DSA—Macroeconomic Assumptions, 2007/08-27/28



Source: Staff projections and simulations.

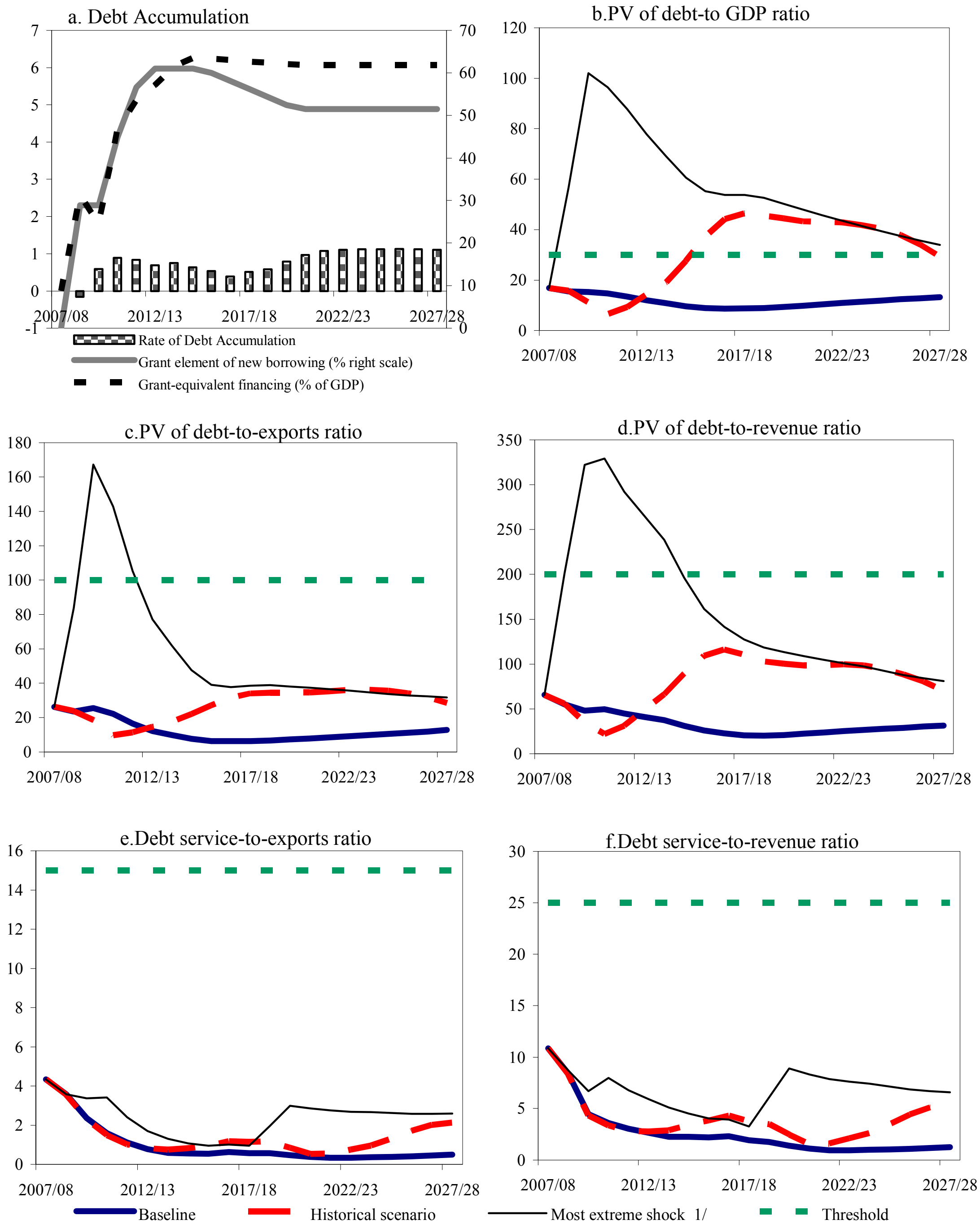
Figure 2. Liberia: Indicators of Public and Publicly Guaranteed External Debt under Alternatives Scenarios, 2008-2028 1/



Source: Staff projections and simulations.

1/ The most extreme stress test is the test that yields the highest ratio in 2018. In figure b. it corresponds to a Combination shock; in c. to a Non-debt flows shock; in d. to a Combination shock; in e. to a Exports shock and in picture f. to a One-time depreciation shock

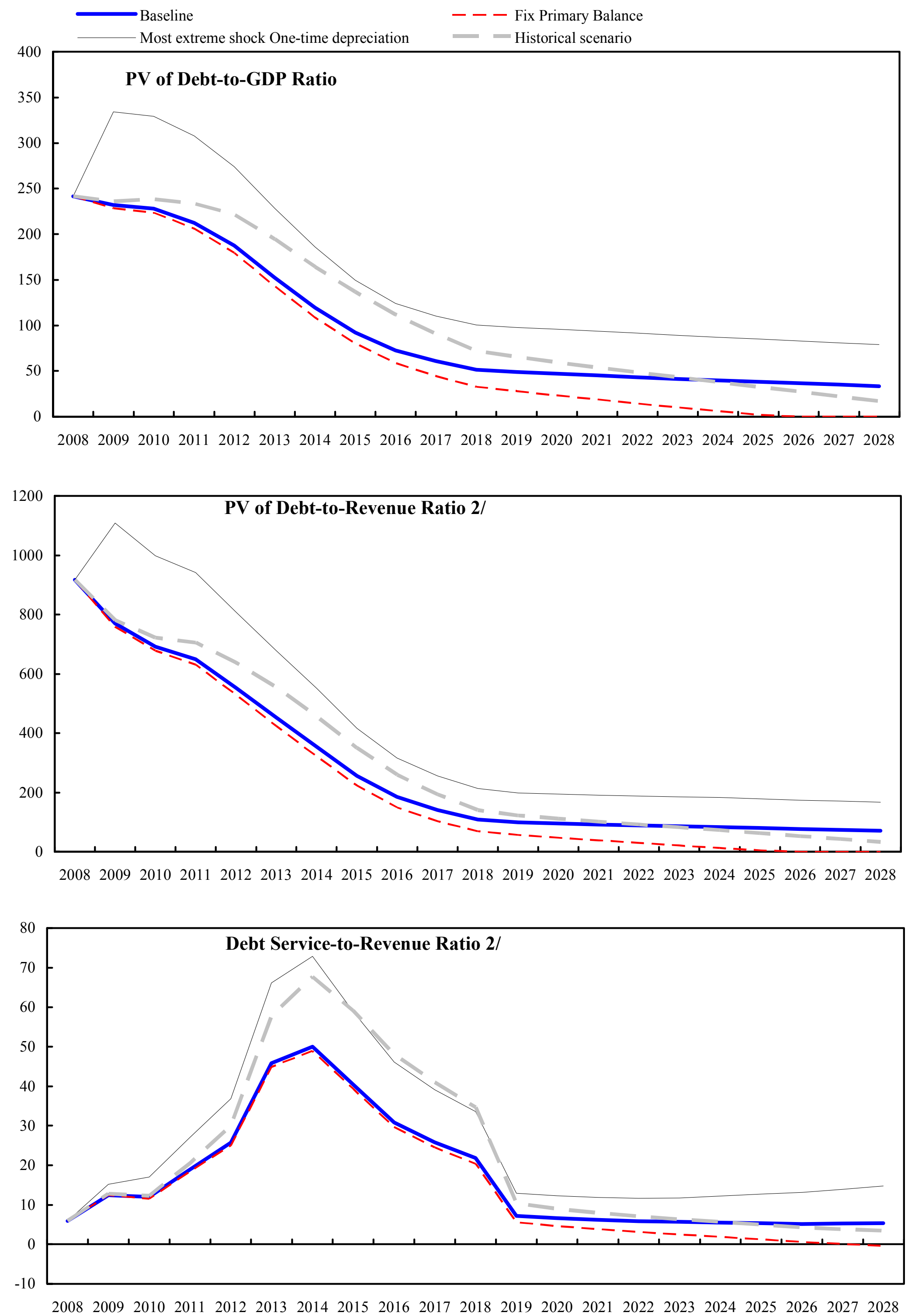
Figure 3. Liberia: Indicators of Public and Publicly Guaranteed External Debt under Completion Point Scenarios, 2008-2028 1/



Source: Staff projections and simulations.

1/ The most extreme stress test is the test that yields the highest ratio in 2018. In figure b. it corresponds to a Combination shock; in c. to a Non-debt flows shock; in d. to a Combination shock; in e. to a Non-debt flows shock and in picture f. to a Combination shock

Figure 4.Liberia: Indicators of Public Debt Under Alternative Scenarios, 2008-2028 1/



Sources: Country authorities; and Fund staff estimates and projections.

1/ The most extreme stress test is the test that yields the highest ratio in 2018.

2/ Revenues are defined inclusive of grants.

Table 1a.: External Debt Sustainability Framework, Baseline Scenario, 2005-2028 1/
(In percent of GDP, unless otherwise indicated)

	Actual	Historical Average	Standard Deviation	Projections									
										2007/08-2012/13			2013/14-2027/2
	2006/07			2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	Average	2017/18	2027/28	Average
External debt (nominal) 1/	**726.2**			**282.6**	**263.3**	**250.4**	**228.9**	**201.4**	**164.2**		**59.8**	**42.8**	
o/w public and publicly guaranteed (PPG)	726.2			282.6	263.3	250.4	228.9	201.4	164.2		59.8	42.8	
Change in external debt	-127.3			-443.6	-19.3	-12.9	-21.5	-27.5	-37.2		-9.1	-1.7	
Identified net debt-creating flows	-116.9			-43.4	-11.9	-3.1	-7.3	-25.3	-28.9		-6.6	7.5	
Non-interest current account deficit	**2.4**	**-0.2**	**10.4**	**28.0**	**31.6**	**50.4**	**51.9**	**22.4**	**9.7**	32.4	**-2.0**	**10.4**	2.6
Deficit in balance of goods and services	99.1			82.3	86.1	100.5	94.6	57.4	22.3		-22.2	-2.4	
Exports	53.0			63.7	66.0	59.6	65.9	81.6	98.4		136.0	103.4	
Imports	152.0			146.0	152.1	160.2	160.5	138.9	120.7		113.7	101.0	
Net current transfers (negative = inflow)	-74.9	-21.5	15.0	-58.8	-61.2	-62.1	-55.3	-47.3	-41.2	-54.3	-26.2	-22.1	-25.9
o/w official	-60.5			-52.9	-55.5	-56.5	-50.1	-42.6	-37.2		-23.9	-19.6	
Other current account flows (negative = net inflow)	-21.8			4.5	6.8	11.9	12.6	12.4	28.7		46.4	34.9	
Net FDI (negative = inflow)	**-9.9**	**-0.2**	**0.2**	**-20.8**	**-31.1**	**-41.0**	**-44.3**	**-32.4**	**-23.3**	-32.2	**-4.6**	**-2.4**	-5.8
Endogenous debt dynamics 2/	**-109.4**			**-50.6**	**-12.5**	**-12.5**	**-14.9**	**-15.3**	**-15.3**		**0.1**	**-0.5**	
Contribution from nominal interest rate	21.4			0.9	3.2	3.1	5.4	8.0	6.6		2.3	1.1	
Contribution from real GDP growth	-62.8			-51.5	-15.7	-15.5	-20.3	-23.2	-21.9		-2.2	-1.6	
Contribution from price and exchange rate changes	-68.0			…	…	…	…	…	…		…	…	
Residual (3-4) 3/	**-10.4**			**-400.2**	**-7.4**	**-9.8**	**-14.2**	**-2.3**	**-8.3**		**-2.6**	**-9.1**	
o/w exceptional financing	-21.7			-394.0	-12.5	-12.0	-5.4	0.0	0.0		0.0	0.0	
PV of external debt 4/	688.2			233.2	226.3	222.7	206.8	181.9	147.8		49.7	31.9	
In percent of exports	1299.4			366.0	343.0	373.4	313.6	223.0	150.1		36.6	30.9	
PV of PPG external debt	**688.2**			**233.2**	**226.3**	**222.7**	**206.8**	**181.9**	**147.8**		**49.7**	**31.9**	
In percent of exports	**1299.4**			**366.0**	**343.0**	**373.4**	**313.6**	**223.0**	**150.1**		**36.6**	**30.9**	
In percent of government revenues	**3154.4**			**911.8**	**804.3**	**703.1**	**705.9**	**604.9**	**504.0**		**118.0**	**76.1**	
Debt service-to-exports ratio (in percent)	**41.3**			**1.7**	**5.6**	**6.1**	**9.0**	**10.3**	**15.4**		**7.5**	**2.4**	
PPG debt service-to-exports ratio (in percent)	**41.3**			**1.7**	**5.6**	**6.1**	**9.0**	**10.3**	**15.4**		**7.5**	**2.4**	
PPG debt service-to-revenue ratio (in percent)	**100.2**			**4.3**	**13.1**	**11.5**	**20.2**	**27.9**	**51.6**		**24.2**	**5.9**	
Total gross financing need (millions of U.S. dollars)	96.8			65.1	35.8	115.8	132.8	-18.3	20.7		85.6	408.3	
Non-interest current account deficit that stabilizes debt ratio	129.7			471.6	51.0	63.3	73.4	50.0	46.9		7.1	12.0	
Key macroeconomic assumptions													
Real GDP growth (in percent)	8.7	3.0	3.4	8.3	6.0	6.2	8.9	11.6	12.8	9.0	3.4	3.7	5.5
GDP deflator in US dollar terms (change in percent)	8.7	4.0	6.2	7.8	1.1	-0.6	1.5	2.7	4.4	2.8	1.3	1.7	1.9
Effective interest rate (percent) 5/	3.0	3.0	1.0	0.1	1.2	1.2	2.4	4.0	3.9	2.1	3.4	2.6	3.3
Growth of exports of G&S (US dollar terms, in percent)	47.2	18.6	32.7	40.3	11.0	-4.6	22.2	41.9	42.2	25.5	2.1	1.8	8.4
Growth of imports of G&S (US dollar terms, in percent)	41.9	17.1	16.1	12.0	11.6	11.2	10.8	-0.7	2.4	7.9	16.8	4.7	6.4
Grant element of new public sector borrowing (in percent)	...	...	...	...	28.9	28.9	44.8	56.7	61.0	44.1	56.2	51.5	54.3
Government revenues (excluding grants, in percent of GDP)	21.8			25.6	28.1	31.7	29.3	30.1	29.3		42.1	42.0	40.4
Aid flows (in millions of US dollars) 7/	1.5			6.1	16.8	11.4	43.7	65.4	83.7		168.9	276.5	
o/w Grants	1.5			6.1	16.8	11.4	33.4	42.9	57.2		120.9	197.9	
o/w Concessional loans	0.0			0.0	0.0	0.0	10.3	22.5	26.5		48.0	78.5	
Grant-equivalent financing (in percent of GDP) 8/	...			...	2.6	1.8	4.3	5.1	5.5		6.2	6.1	6.1
Grant-equivalent financing (in percent of external financing) 8/	...			...	64.3	59.1	78.8	83.6	87.6		87.6	86.2	87.0
Memorandum items:													
Nominal GDP (millions of US dollars)	673.1			785.3	841.2	888.0	981.7	1125.9	1326.8		2398.9	3926.4	
Nominal dollar GDP growth	18.1			16.7	7.1	5.6	10.5	14.7	17.8	**12.1**	4.7	5.4	7.6
PV of PPG external debt (in millions of US dollars)	4632.0			1831.0	1903.7	1977.5	2029.9	2048.3	1960.4		1192.7	1253.4	
(PVt-PVt-1)/GDPt-1 (in percent)				0.0	**9.3**	**8.8**	**5.9**	1.9	-7.8	3.0	-6.8	0.1	-2.8

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 (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 1b.Liberia: Sensitivity Analysis for Key Indicators of Public and Publicly Guaranteed External Debt, 2008-2028
(In percent)

	Projections																				
	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	**2017/18**	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28
PV of debt-to GDP ratio																					
Baseline	233	226	223	207	182	148	116	89	70	59	**50**	47	46	44	42	40	38	37	35	34	32
A. Alternative Scenarios																					
A1. Key variables at their historical averages in 2008-2028 1/	233	226	214	201	194	181	166	156	150	142	**131**	125	119	114	109	104	99	93	87	79	70
A2. New public sector loans on less favorable terms in 2008-2028 2	233	226	222	207	183	149	118	91	73	62	**53**	51	50	49	47	46	45	43	42	41	40
B. Bound Tests																					
B1. Real GDP growth at historical average minus one standard deviation in 2009-2010	233	241	253	234	206	167	131	101	80	67	**56**	54	51	49	47	45	43	41	40	38	36
B2. Export value growth at historical average minus one standard deviation in 2009-2010 3/	233	234	239	222	195	160	126	98	79	67	**58**	55	53	50	48	46	44	41	39	37	35
B3. US dollar GDP deflator at historical average minus one standard deviation in 2009-2010	233	231	228	212	186	151	119	91	72	60	**51**	48	46	44	43	41	39	37	36	34	32
B4. Net non-debt creating flows at historical average minus one standard deviation in 2009-2010 4/	233	266	307	286	254	212	172	138	115	103	**93**	90	85	80	76	71	67	63	59	55	51
B5. Combination of B1-B4 using one-half standard deviation shocks	233	275	322	300	266	221	180	145	120	107	**97**	93	88	84	79	74	70	65	61	57	54
B6. One-time 30 percent nominal depreciation relative to the baseline in 2009 5/	233	322	317	294	258	210	164	126	100	83	**70**	67	64	62	59	56	54	52	50	47	45
PV of debt-to-exports ratio																					
Baseline	366	343	373	314	223	150	106	72	51	42	**37**	36	35	35	34	34	33	32	32	31	31
A. Alternative Scenarios																					
A1. Key variables at their historical averages in 2008-2028 1/	366	342	359	305	238	184	152	125	109	102	**96**	95	93	91	89	88	85	83	79	74	68
A2. New public sector loans on less favorable terms in 2008-2028 2	366	342	373	314	224	152	108	73	53	44	**39**	39	39	39	39	39	38	38	38	38	38
B. Bound Tests																					
B1. Real GDP growth at historical average minus one standard deviation in 2009-2010	366	343	373	313	223	150	106	71	51	42	**36**	36	35	35	34	33	33	32	32	31	31
B2. Export value growth at historical average minus one standard deviation in 2009-2010 3/	366	457	574	483	344	233	166	113	82	69	**61**	60	59	58	57	55	54	53	51	50	49
B3. US dollar GDP deflator at historical average minus one standard deviation in 2009-2010	366	343	373	313	223	150	106	71	51	42	**36**	36	35	35	34	33	33	32	32	31	31
B4. Net non-debt creating flows at historical average minus one standard deviation in 2009-2010 4/	366	403	515	434	312	215	158	111	84	74	**69**	68	66	64	62	60	58	55	53	51	50
B5. Combination of B1-B4 using one-half standard deviation shocks	366	437	516	435	312	215	158	111	83	73	**68**	67	66	64	62	60	57	55	53	51	49
B6. One-time 30 percent nominal depreciation relative to the baseline in 2009 5/	366	343	373	313	223	150	106	71	51	42	**36**	36	35	35	34	33	33	32	32	31	31
PV of debt-to-revenue ratio																					
Baseline	912	804	703	706	605	504	400	288	206	155	**118**	107	103	99	96	93	90	86	82	79	76
A. Alternative Scenarios																					
A1. Key variables at their historical averages in 2008-2028 1/	912	802	675	686	646	619	573	505	437	373	**311**	282	269	258	250	243	233	219	203	187	167
A2. New public sector loans on less favorable terms in 2008-2028 2	912	802	702	707	608	509	407	295	213	163	**126**	116	113	111	108	106	105	102	99	97	94
B. Bound Tests																					
B1. Real GDP growth at historical average minus one standard deviation in 2009-2010	912	855	797	800	686	571	453	326	233	175	**133**	121	116	112	108	105	102	97	93	89	86
B2. Export value growth at historical average minus one standard deviation in 2009-2010 3/	912	830	754	757	650	545	437	318	230	176	**137**	125	119	115	110	106	102	97	92	89	84
B3. US dollar GDP deflator at historical average minus one standard deviation in 2009-2010	912	821	721	724	620	516	410	295	210	158	**120**	109	105	101	98	95	92	88	84	81	77
B4. Net non-debt creating flows at historical average minus one standard deviation in 2009-2010 4/	912	946	970	978	845	722	596	448	337	270	**221**	202	192	183	174	165	157	147	138	130	122
B5. Combination of B1-B4 using one-half standard deviation shocks	912	978	1016	1024	885	755	623	468	351	281	**230**	210	199	190	181	172	164	153	144	136	128
B6. One-time 30 percent nominal depreciation relative to the baseline in 2009 5/	912	1143	1000	1003	860	716	568	409	292	219	**167**	151	145	140	135	131	127	122	116	112	107

Table 1b.Liberia: Sensitivity Analysis for Key Indicators of Public and Publicly Guaranteed External Debt, 2008-2028 (continued)
(In percent)

Debt service-to-exports ratio																					
Baseline	2	6	6	9	10	15	15	11	9	8	**8**	3	2	2	2	2	2	2	2	2	2
A. Alternative Scenarios																					
A1. Key variables at their historical averages in 2008-2028 1/	2	6	6	9	11	18	19	15	13	12	**11**	4	4	3	4	4	4	4	5	5	5
A2. New public sector loans on less favorable terms in 2008-2028 2	2	6	6	9	10	15	15	11	9	8	**8**	3	3	3	3	3	3	3	3	3	3
B. Bound Tests																					
B1. Real GDP growth at historical average minus one standard deviation in 2009-2010	2	6	6	9	10	15	15	11	9	8	**8**	3	2	2	2	2	2	2	2	2	2
B2. Export value growth at historical average minus one standard deviation in 2009-2010 3/	2	7	9	13	15	22	22	16	13	11	**11**	4	4	4	4	4	4	4	4	4	4
B3. US dollar GDP deflator at historical average minus one standard deviation in 2009-2010	2	6	6	9	10	15	15	11	9	8	**8**	3	2	2	2	2	2	2	2	2	2
B4. Net non-debt creating flows at historical average minus one standard deviation in 2009-2010 4/	2	6	7	11	12	16	16	12	9	8	**8**	4	5	5	5	5	4	4	4	4	4
B5. Combination of B1-B4 using one-half standard deviation shocks	2	6	7	11	12	16	16	12	9	8	**8**	4	5	5	5	5	4	4	4	4	4
B6. One-time 30 percent nominal depreciation relative to the baseline in 2009 5/	2	6	6	9	10	15	15	11	9	8	**8**	3	2	2	2	2	2	2	2	2	2
Debt service-to-revenue ratio																					
Baseline	4	13	12	20	28	52	57	45	35	29	**24**	8	7	7	6	6	6	6	6	6	6
A. Alternative Scenarios																					
A1. Key variables at their historical averages in 2008-2028 1/	4	13	11	20	29	59	72	62	52	43	**36**	13	11	10	10	10	11	11	12	13	13
A2. New public sector loans on less favorable terms in 2008-2028 2	4	13	12	20	28	52	58	45	35	29	**25**	8	8	7	7	7	7	7	7	7	7
B. Bound Tests																					
B1. Real GDP growth at historical average minus one standard deviation in 2009-2010	4	14	13	23	32	59	65	51	39	33	**27**	9	8	8	7	7	7	7	6	6	7
B2. Export value growth at historical average minus one standard deviation in 2009-2010 3/	4	13	12	21	29	52	58	45	35	29	**24**	9	9	8	8	7	7	7	7	7	7
B3. US dollar GDP deflator at historical average minus one standard deviation in 2009-2010	4	13	12	21	29	53	59	46	36	29	**25**	8	7	7	7	6	6	6	6	6	6
B4. Net non-debt creating flows at historical average minus one standard deviation in 2009-2010 4/	4	13	13	24	31	55	60	47	36	30	**25**	12	15	14	13	13	12	12	11	11	11
B5. Combination of B1-B4 using one-half standard deviation shocks	4	14	14	26	33	58	64	49	39	32	**27**	13	15	14	14	13	13	12	12	12	11
B6. One-time 30 percent nominal depreciation relative to the baseline in 2009 5/	4	19	16	29	40	73	82	63	49	41	**34**	11	10	10	9	9	9	8	8	8	8
Memorandum item:																					
Grant element assumed on residual financing (i.e., financing required above baseline) 6/	51	51	51	51	51	51	51	51	51	51	**51**	51	51	51	51	51	51	51	51	51	51

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 (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 2a.Liberia: Public Sector Debt Sustainability Framework, Baseline Scenario, 2004/05-2027/28
(In percent of GDP, unless otherwise indicated)

	Actual	Historical	Standard	Estimate	Projections								
		Average 5/	Deviation							2007/08-2012/13			2007/08-2012/1
	2006/07			2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	Average	2017/18	2027/28	Average
Public sector debt 1/	731.2			286.0	265.8	252.7	230.8	203.8	166.2		60.8	43.8	
o/w foreign-currency denominated	726.2			282.6	263.3	250.4	228.9	201.4	164.2		59.8	42.8	
Change in public sector debt	-128.8			-445.2	-20.1	-13.1	-21.9	-27.0	-37.6		-9.2	-1.7	
Identified debt-creating flows	-124.2			-489.1	-19.9	-15.4	-24.0	-28.9	-38.1		-10.0	-2.7	
Primary deficit	-3.8	-1.3	1.5	-2.2	1.5	-0.8	-0.5	0.6	0.5	-0.1	0.5	0.9	0.7
Revenue and grants	22.0			26.3	30.1	33.0	32.7	33.9	33.6		47.2	47.0	
of which: grants	0.2			0.8	2.0	1.3	3.4	3.8	4.3		5.0	5.0	
Primary (noninterest) expenditure	18.2			24.1	31.7	32.2	32.2	34.5	34.1		47.7	47.9	
Automatic debt dynamics	-99.6			-107.7	-18.0	-11.1	-17.9	-21.6	-24.2		-0.8	-1.2	
Contribution from interest rate/growth differential	-110.1			-104.4	-16.2	-10.8	-18.8	-21.3	-24.2		-0.8	-1.2	
of which: contribution from average real interest rate	-41.4			-48.6	-0.2	4.8	2.0	2.7	-1.0		1.4	0.4	
of which: contribution from real GDP growth	-68.7			-55.8	-16.1	-15.6	-20.8	-24.1	-23.2		-2.3	-1.6	
Contribution from real exchange rate depreciation	10.5			-3.3	-1.7	-0.3	0.9	-0.2	0.0		...	...	
Other identified debt-creating flows	-20.8			-379.2	-3.5	-3.5	-5.6	-8.0	-14.4		-9.7	-2.3	
Privatization receipts (negative)	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	
Debt relief (HIPC and other)	-20.8			-379.2	-3.5	-3.5	-5.6	-8.0	-14.4		-9.7	-2.3	
Other (specify, e.g. bank recapitalization)	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Residual, including asset changes	-4.6			43.9	-0.2	2.3	2.0	1.9	0.5		0.8	1.0	
Other Sustainability Indicators													
PV of public sector debt	710.8			241.6	232.0	228.0	212.2	187.4	152.3		51.3	33.3	
o/w foreign-currency denominated	705.8			238.3	229.4	225.6	210.3	185.0	150.3		50.3	32.3	
o/w external	703.8			236.9	228.2	224.4	209.2	184.0	149.5		50.3	32.3	
PV of contingent liabilities (not included in public sector debt)	...			...	...	...	...	...	...		...	...	
Gross financing need 2/	19.6			-0.7	5.3	3.1	5.7	9.3	16.7		11.7	4.3	
PV of public sector debt-to-revenue and grants ratio (in percent)	3225.1			917.2	769.8	691.8	649.0	553.0	452.8		108.8	70.9	
PV of public sector debt-to-revenue ratio (in percent)	3258.1			945.0	824.5	719.8	724.3	623.1	519.3		121.8	79.4	
o/w external 3/	3226.3			926.7	810.9	708.5	714.0	611.9	509.8		119.4	76.9	
Debt service-to-revenue and grants ratio (in percent) 4/	106.2			5.9	12.5	12.0	19.0	25.7	45.8		21.8	5.4	
Debt service-to-revenue ratio (in percent) 4/	107.3			6.1	13.3	12.4	21.1	28.9	52.5		24.4	6.0	
Primary deficit that stabilizes the debt-to-GDP ratio	125.0			443.0	21.7	12.3	21.5	27.6	38.1		9.7	2.5	
Key macroeconomic and fiscal assumptions													
Real GDP growth (in percent)	8.7	3.0	3.4	8.3	6.0	6.2	8.9	11.6	12.8	9.0	3.4	3.7	5.5
Average nominal interest rate on forex debt (in percent)	3.0	0.2	0.3	0.1	1.2	1.2	2.4	4.0	3.9	2.1	3.4	2.6	3.2
Average real interest rate on domestic debt (in percent)	-11.2	-9.4	2.3	-11.0	-3.3	-0.8	-3.0	-0.1	-2.8	-3.5	3.3	2.6	2.2
Real exchange rate depreciation (in percent, + indicates depreciation)	1.4	0.5	8.0	-0.5	...	...	...	...	...	...	...	...	...
Inflation rate (GDP deflator, in percent)	12.6	7.6	8.8	12.5	3.5	1.0	4.4	6.5	7.5	5.9	4.2	4.6	4.8
Growth of real primary spending (deflated by GDP deflator, in percent)	0.6	5.1	34.2	0.4	0.4	0.1	0.1	0.2	0.1	0.2	0.1	0.0	0.1
Grant element of new external borrowing (in percent)	...	…	…	...	28.9	28.9	44.8	56.7	61.0	44.1	56.2	51.5	...

Sources: Country authorities; and Fund staff estimates and projections.

1/ Data covers central government debt. Domestic debt data was reconciled in 2006/07.

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 2b.Liberia: Sensitivity Analysis for Key Indicators of Public Debt 2008-2028

	Projections							
	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2017/18	2027/28
PV of Debt-to-GDP Ratio								
Baseline	242	232	228	212	187	152	51	33
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	242	236	238	234	222	195	72	17
A2. Primary balance is unchanged from 2008	242	229	223	206	179	143	33	0
A3. Permanently lower GDP growth 1/	242	234	232	218	194	160	65	92
A4. Alternative Scenario :[Costumize, enter title]	243	233	229	228	228	222	173	112
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2009-2010	242	248	264	249	224	186	87	115
B2. Primary balance is at historical average minus one standard deviations in 2009-2010	242	231	228	212	187	152	51	33
B3. Combination of B1-B2 using one half standard deviation shocks	242	241	248	233	209	172	74	90
B4. One-time 30 percent real depreciation in 2009	242	334	329	308	274	228	100	79
B5. 10 percent of GDP increase in other debt-creating flows in 2009	242	241	237	221	195	159	56	38
PV of Debt-to-Revenue Ratio 2/								
Baseline	917	770	692	649	553	453	109	71
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	917	781	722	706	638	555	141	33
A2. Primary balance is unchanged from 2008	917	759	678	631	530	425	69	0
A3. Permanently lower GDP growth 1/	917	775	703	664	572	473	137	192
A4. Alternative Scenario :[Costumize, enter title]	921	943	901	972	991	989	811	525
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2009-2010	917	821	797	752	652	545	183	242
B2. Primary balance is at historical average minus one standard deviations in 2009-2010	917	766	690	648	552	452	108	70
B3. Combination of B1-B2 using one half standard deviation shocks	917	796	750	707	609	506	156	189
B4. One-time 30 percent real depreciation in 2009	917	1109	999	942	809	679	213	168
B5. 10 percent of GDP increase in other debt-creating flows in 2009	917	800	719	675	576	473	119	80
Debt Service-to-Revenue Ratio 2/								
Baseline	6	12	12	19	26	46	22	5
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	6	13	12	21	30	58	35	3
A2. Primary balance is unchanged from 2008	6	12	12	18	25	45	20	0
A3. Permanently lower GDP growth 1/	6	13	12	19	26	47	24	11
A4. Alternative Scenario :[Costumize, enter title]	6	15	15	25	39	78	72	19
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2009-2010	6	13	14	22	30	52	27	16
B2. Primary balance is at historical average minus one standard deviations in 2009-2010	6	12	12	19	26	46	22	5
B3. Combination of B1-B2 using one half standard deviation shocks	6	13	13	20	28	50	25	12
B4. One-time 30 percent real depreciation in 2009	6	15	17	27	37	66	34	15
B5. 10 percent of GDP increase in other debt-creating flows in 2009	6	12	13	20	27	47	22	6

Sources: Country authorities; and Fund 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.