INTERNATIONAL MONETARY FUND

LIBERIA

STAFF REPORT FOR THE 2018 ARTICLE IV CONSULTATION—DEBT SUSTAINABILITY ANALYSIS

May 24, 2018

Risk of external debt distress:	Moderate
Augmented by significant risks stemming from domestic public and/or private external debt?	No

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Liberia remains at moderate risk of debt distress, though care and precision in implementing its ambitious infrastructure program will be critical. Under the baseline scenario, which reflects staff's interpretation of the authorities' stated plans, Liberia will remain at moderate risk of debt distress but move closer to thresholds that mark a high probability of debt distress. Adverse risks to the baseline are also significant. Staff discussed an alternative reform scenario that would ease the risk of debt distress while achieving roughly the same level of spending. The reform scenario assumes that all external financing would be on concessional terms and the amount of additional borrowing would be strictly controlled and supplemented with domestic resource mobilization. Such steps would be beneficial not only to improve the safety margin for the preservation of debt and macroeconomic stability, but also to sustain broad-based growth over the forecast horizon.

CONTEXT

1. **This debt sustainability analysis (DSA) was conducted in the context of the 2018 Article IV consultation**. The last Low-Income Country DSA (LIC-DSA) update was considered by the Executive Board in November 2017 as part of Liberia's seventh and eight reviews under the Extended Credit Facility Arrangement (ECF).[1] In January, Liberia successfully completed its first democratic political transition between different political parties since 1944. It does not currently have a Fund-supported program but continues to be subject to the IDA Non-Concessional Borrowing Policy (NCBP) regardless of the risk of debt distress.[2]

2. **Liberia remains a fragile country vulnerable to external shocks, with a significant infrastructure deficit and poor living conditions for the majority of its population**. Two civil wars between 1989 and 2003 effectively destroyed Liberia's basic infrastructure and social services. When the war ended, average income in Liberia was just one-quarter of what it had been in 1989 and just one-sixth of its level before the 1980 coup (Box 1, Staff Report). This cumulative decline in GDP was substantial, even compared to similar dramatic episodes in other countries. By 2008, Liberia's total external debt had reached $4.7 billion in nominal terms (over 600 percent of GDP) and was mostly in arrears. In 2010, the Heavily Indebted Poor Countries (HIPC) debt relief initiative's completion was reached, and debt-financed reconstruction of the country began. After eight years, however, there is still far to go. The Mount Coffee hydropower plant is rehabilitated, but an estimated 81 percent of households still have no electricity. Moreover, only 5 percent of the country's roads are paved, leaving much of the population isolated during the six-month rainy season.

3. **More recently, Liberia has seen a sharp decline in grant inflows, which were elevated during 2014–16**. Total grant inflows declined from 19.3 percent of GDP in FY2016 to 16.7 percent of GDP in FY2017, as significant amounts of grants were frontloaded during the Ebola crisis, the largely grant-financed rehabilitation of the Mount Coffee hydropower station was completed, and UN peacekeeping operations were wound down. With limited domestic revenue mobilization and expenditure adjustment, the overall fiscal deficit increased from 2.7 percent of GDP in FY2016 to 4.8 percent of GDP in FY2017.

4. **National accounts data have been revised, and indicate that Liberia's nominal GDP is higher than previously reported by a factor of between 1.5 to 1.6** (¶3, Staff Report). Thus, the potential tax base is significantly higher than previously estimated and more effort is needed to tap into those domestic resources.

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[1] The DSA was prepared jointly by the staff of the IMF and World Bank, in collaboration with the authorities of Liberia. The last joint DSA update prepared for the 7th and 8th ECF review can be found in IMF Country Report No. 17/348, November 2017.

[2] The NCBP requires a minimum grant element of 35 percent or higher, should a higher minimum level be required under a Fund-supported program.

5. Accumulation of external debt has accelerated since 2010 due to scaled-up infrastructure spending and the fiscal response to a series of adverse shocks. The total public external debt stock was $736 million (25 percent of GDP) at end-FY2017, comprising mostly multilateral loans (Text Table 1).[3] The GOL also has ratified but undisbursed loans amounting to $422 million. Two thirds of the total debt outstanding, $431 million, was disbursed during the last four years (FY2014–17). The distribution of external loans is concentrated in infrastructure (excluding energy) and basic services (37 percent), energy (29 percent), public administration (including both public finance management and budget support, 24 percent), agriculture (7 percent), and health (4 percent) (Staff Report, Annex VII).

6. The coverage of fiscal data has been expanded to include off-budget grant-financed project spending.[4] For example, FY2016 revenue is reported at $453 million (14.0 percent of GDP), but reported grants now include both budget support and project financing grants, which amount to $624 million (19.3 percent of GDP) instead of $199 million reported in IMF Country Report 17/348.

Text Table 1. Liberia: Composition of External Debt Stock, 2017

	End of March 2017	
	Millions of US dollar	Percent of Total
Total debt stock	**736**	**100**
(as % of GDP)	25	
By creditors		
Multilateral including IMF	683	93
Of which:		
IMF	199	27
World Bank	291	40
AfDB	70	9
Bilateral	54	7

Sources: Liberian authorities; and IMF staff calculations

7. Finally, as remittances data have become more reliable over time, remittances have now been included in the assessment of Liberia's capacity to repay its external obligations in this DSA. Liberia's inward remittances averaged close to 18 percent of GDP and 78 percent of exports of goods and services between 2015 and 2017.

UNDERLYING ASSUMPTIONS

8. The baseline scenario presented in this Article IV consultation is staff's interpretation of the authorities' stated policies as articulated at the time of the March 2018 mission. The key changes in the macroeconomic assumptions relative to the November 2017 DSA update are as follows (Text Table 2):

- The path of ***real GDP growth*** is projected to be lower to account for the upward revision in the GDP level. Growth is projected at 3.2 percent in 2018, compared to 3.9 percent in the previous DSA update, and is mostly driven by a further expansion of the mining sector.

[3] The debt to GDP ratio calculated for the Staff Report and the DSA differ because the former uses debt and GDP expressed in U.S. dollars, while the latter uses those expressed in national currency.

[4] Fiscal data cover the central government, and all public external debt is included in the analysis.

- The ***fiscal position*** of the central government in FY2018 and subsequent years has been revised to reflect revenue shortfalls observed since November 2017.

- An average annual financing gap of about 26 million (0.7 percent of GDP) is projected under the assumption that current expenditure would not fully adjust to accommodate a shrinking fiscal resource envelope,[5] given the high level of development and social spending needs. The gap is expected to be filled with non-debt creating flows or under execution of spending.

Text Table 2. Liberia: Underlying DSA Assumptions

		FY2018	FY2018-2023	FY2023-2040
Nominal GDP		(In million US dollar)	Growth (In percent)	Growth (In percent)
Nov 2017 Board		2154	6.4	8.8
Current	*Baseline*	3367	6.1	7.6
	Reform	3367	6.1	7.7
Exports of Goods and Service				
Nov 2017 Board		629	7.5	6.4
Current	*Baseline*	721	3.5	6.0
	Reform	722	3.4	6.1

Sources: Liberian authorities; and IMF staff projections.

- The ***current account deficit*** has been revised downwards for 2018 and subsequent years relative to the previous DSA update. The trade balance has also improved due to the decline in fuel imports. This DSA also assumes substantially lower iron ore production in the medium to long term, as it no longer assumes the return of the iron ore producer China Union to Liberia in the medium term.

9. External borrowing and accompanying debt disbursement are revised upwards to reflect the newly elected government's ambitious infrastructure plan over the medium term.

- ***Borrowing***. The baseline assumes that: (i) annual external loan disbursements almost double from about $60 million during the past four years to $120 million in the medium term and (ii) already ratified, but not disbursed, loans ($422 million) will be disbursed by the end of the medium term. The combination of these two would increase public external debt by about $1 billion in the next five years. If the financing gap were to be filled with additional borrowing, the public external debt to GDP ratio would increase to over 40.7 percent of GDP by 2023 (Staff Report, Text Table 2).

- ***Financing terms***. The baseline assumes no constraint on the availability of concessional loans. The grant element is assumed at 45 percent (Figure 1, panel a). However, as financing terms are assumed to be less favorable over the medium term when the elevating borrowing will take place, the baseline assumes that borrowing will be mostly on IDA terms until 2030 when the grant element will begin to gradually decline to 35 percent.

[5] With the current assumptions on the pace of reforms, domestic revenue is expected to improve by 2 percentage points of GDP over the medium term. Over the same period, however, aid inflows are anticipated to decline by 5.5 percentage points of GDP, resulting in a continuously shrinking fiscal resource envelope.

Box 1. Key Baseline Macroeconomic Assumptions, 2018–37

Real GDP growth. Following a period of sluggish growth due to stronger-than-expected adverse external shocks, and assuming the implementation of good policies, the medium-term outlook appears favorable. GDP growth in 2018 is projected at 3.2 percent, driven by expansion in the mining sector, and is expected to steadily increase to 5.3 percent by 2023. A number of factors are contributing to this positive outlook: (i) the peaceful political transition is favorable for the recovery of the domestic economy, as it will improve both consumer and investor confidence; (ii) the recovery in commodity prices is expected to positively impact key sectors of the Liberian economy (particularly iron ore and gold); (iii) improvements in power supply and road connectivity will support economic activity in the medium to long terms; and (iv) the effect of the rehabilitation of roads on aggregate supply would also be significant (Box 1, Staff Report). However, the effect of road construction on aggregate demand may be fairly limited, since only a small part of the total cost of asphalt-surfaced, capital-intensive roads would be expected to be sourced locally. The medium-term outlook is subject to both upside and downside risks (Annex III, Staff Report).

Inflation. Inflation is projected to remain high in the near term, given the sharp depreciation of the Liberian dollar in the past year, and then to gradually decline from an estimated 11.7 percent in 2018 to 6.3 percent in 2023. In the long run, inflation is set to continue its gradual decline and stabilize at around 5½ to 6 percent.

Tax revenues. The revenue-to-GDP ratio is estimated to improve from 12.9 percent in FY2018 to 15 percent in FY2023 by, among other measures, improving tax compliance and efficiency and expanding coverage, after which it is expected to remain broadly stable.

Fiscal balance. The fiscal deficit is expected to remain elevated as the authorities meet high spending needs, declining only from 5.1 percent of GDP in FY2018 to 4.4 percent in FY2023.

External account. The current account deficit has improved compared to the previous DSA and is projected to improve due to a further contraction in imports. However, with a decline in current transfers, the current account deficit will nonetheless remain elevated at 22.4 percent of GDP in 2018. With limited net capital inflows anticipated for the remainder of 2018, gross international reserves are projected to decrease further to about 3 months of imports by the end of 2018, which is lower than in the previous DSA update. The External Sector Assessment (ESA) shows that Liberia's external position is substantially weaker than implied by fundamentals and desirable policy settings.

EXTERNAL DEBT SUSTAINABILITY ANALYSIS

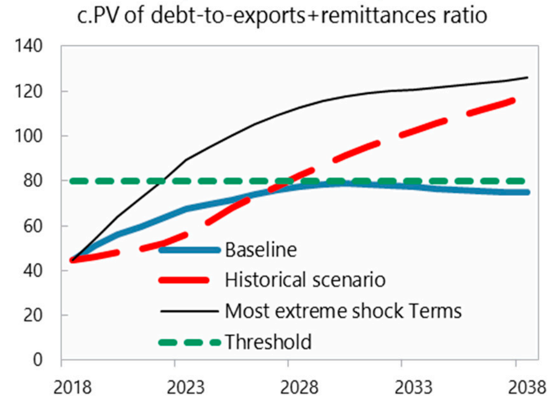
10. Liberia's risk of distress will remain moderate assuming the government uses care and precision in the implementation of its ambitious infrastructure program. The authorities' large-scale plan to rehabilitate the national road network will significantly raise the PV of debt relative to its foreign exchange earning capacity, bringing it closer to the threshold that marks high risk of debt distress (Table 1; Figure 1, panel c).

11. Given the concessional financing terms, the ratios of debt service-to-exports and debt service to-revenue will remain within the range associated with moderate risk of debt distress. The burden of debt service will remain relatively low until 2030 (Table 1; Figure 1, panels e and f), and only rise marginally thereafter, making the near- to medium-term servicing of debt manageable.

12. The sustainability of the external debt profile is most vulnerable to terms of trade shocks and changes in the exchange rate (Table 2). Under the baseline scenario, given the positive medium- to long-term outlook for growth and revenue, the PV of public external debt, measured either as a ratio to GDP or to revenue, remains consistent with moderate risk of debt distress (Figure 1, panels b and d). Sensitivity analysis, however, shows that the PV of external debt surpasses the threshold if Liberia experiences the most extreme shocks—either a one-time 30 percent depreciation or a one-standard-deviation terms of trade shock.

Text Figure 1. Liberia: If Financing Gap is Financed with External Borrowing

(Million US dollars)



13. If the financing gap projected under the baseline scenario were financed by external borrowing, Liberia would move to a high risk of debt distress. This deterioration would take place even if the additional borrowing was on IDA terms (Text Figure 1).

PUBLIC SECTOR DEBT SUSTAINABILITY

14. The public sector DSA also highlights the importance of fiscal adjustments and sustained growth. Given the limited available domestic sources of funding, the general picture of domestic debt sustainability is similar to the analysis for the public external debt sustainability. The PV of public debt-to-GDP ratio is projected to increase from an estimated 19.5 in FY2018 to a peak of 22.3 in FY2027 and decline slowly thereafter (Table 3; Figure 2), while staying well below the benchmark of 38 percent of GDP that marks a high risk of debt distress. However, the alternative scenario, where the current primary deficit remains at 4.6 percent of GDP, highlights the importance of effecting a gradual adjustment over time (Figure 2, first panel). Moreover, sensitivity analysis illustrates Liberia's vulnerability to growth shocks, with the most extreme shock— a one standard deviation shock to growth in 2019–20—highlighting the importance of sustained growth going forward.

REFORM SCENARIO

15. Staff also discussed a reform scenario that would ease the risk of debt distress while achieving roughly the same level of spending. By adopting additional measures to mitigate the baseline's adverse impact on debt, this scenario allows for greater assurance of debt and macroeconomic sustainability, while achieving the same development goals. This reform scenario (Text Table 3; Text Figure 2), which

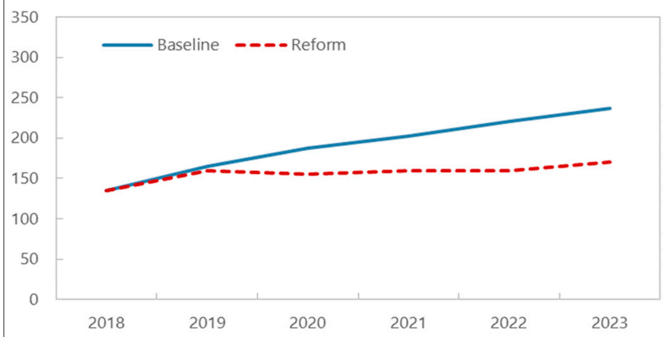
Text Table 3. Liberia: Baseline vs. Reform

(Million U.S. dollar; unless otherwise indicated)

	FY2014-17	FY2018-23	
		Baseline	Reform
New loans (annual average)	60	120	85
Primary balance improves by (percentage point of GDP)		0.7	2.7

relies less on external borrowing, entails: (i) annual external loan disbursements increasing from about $60 million over the past four years to about $85 million in the medium term ($35 million less than in the baseline scenario); (ii) financing on IDA terms (close to 60 percent grant element rather than 45 percent grant element); (iii) already ratified, but not disbursed loans totaling US$422 million are disbursed by the end of the medium term (same as in the baseline); and (iv) additional domestic resources of 3 percentage points of GDP are mobilized by FY2023 to compensate for reduced borrowing. The combination of all these measures would allow the government to have the same level of public resources available to meet development and social spending needs while reducing significantly the risk factors (outlined in ¶16 and ¶17).

Text Figure 2. Annual Disbursement Schedule
(Millions of US dollars)



Source: IMF Staff Projection.

16. There are uncertainties around the borrowing limits proposed in both scenarios that have implications for debt sustainability:

- *Timing of disbursement and inventories:* Liberia has ratified various loans in recent years, and the timing of disbursement is uncertain. If disbursement of the whole $422 million of these loans was to take place in the next few years, then the change in timing of disbursement alone could lead to an elevated risk of debt distress.

- *Concessionality of new loans:* If new loans were on concessional terms, but with less favorable terms than those offered by IDA, Liberia's risk of debt distress could deteriorate to "high" as this would raise the PV of debt and debt service.

17. The main sources of downside and upside risks that can affect the level of debt distress in the reform scenario would be the same as in the baseline scenario:

- *High volatility in exports:* Exports of goods and services have been volatile, as the standard deviation of the export growth rate is around 15 percent. Thus, Liberia remains vulnerable to exogenous shocks (e.g., commodity price shocks). This volatility poses both downside and upside risk. A sharp decline in exports of goods and services could bring Liberia to a high level of debt distress. On the upside, an increase in remittances (which are less volatile than exports) or the return of China Union would improve the risk assessment.

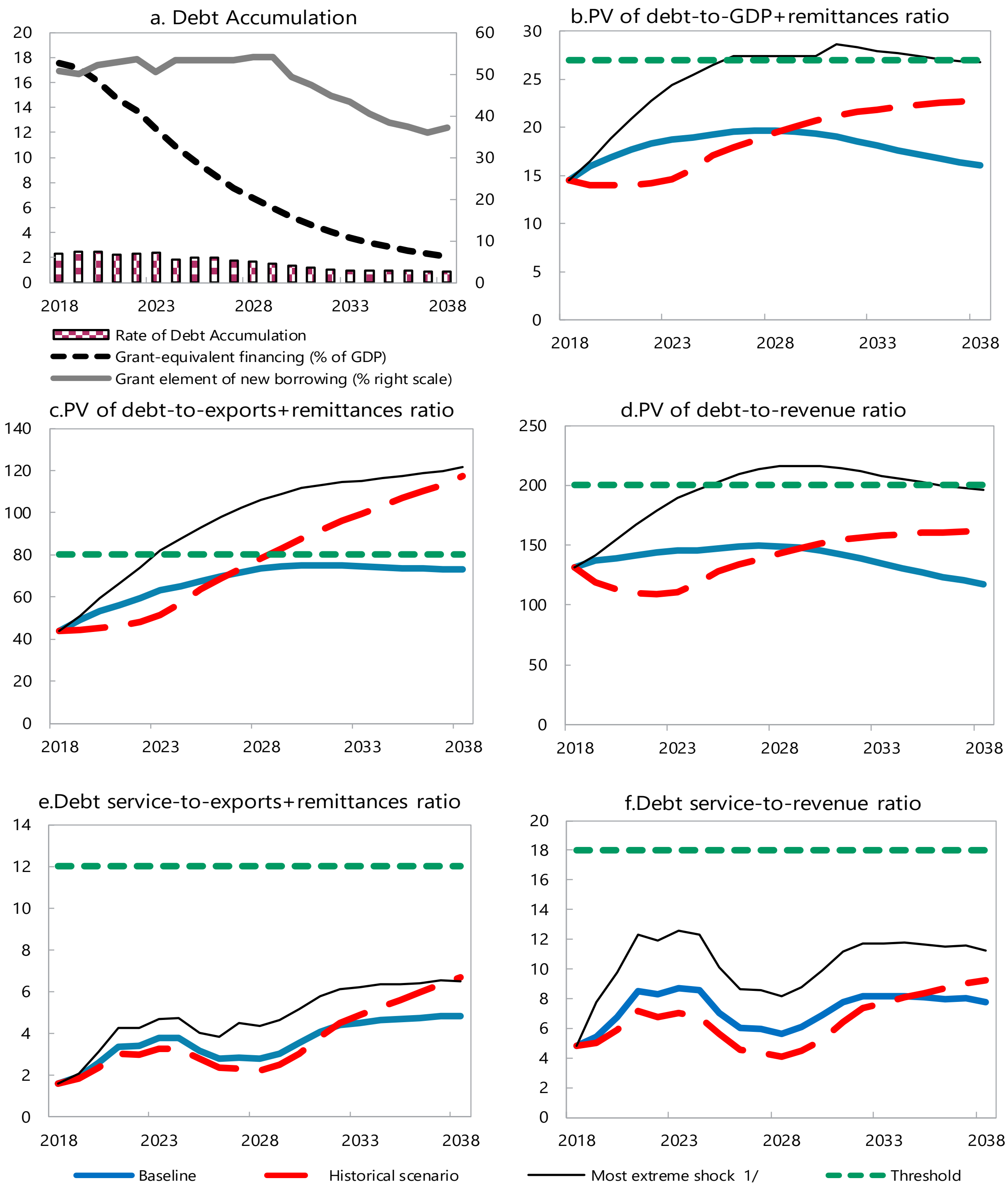
- *High volatility in growth*: Shocks to growth could have nontrivial impacts as discussed above. Sustained growth is critically important.

CONCLUSION AND AUTHORITIES' VIEWS

18. Liberia's vulnerabilities call for a prudent fiscal policy, maintenance of the fiscal anchor on debt accumulation, and the implementation of effective measures to mobilize domestic resources. To maintain debt levels at moderate levels, it is important to continue to prioritize grants and concessional loans. A strong commitment to mobilizing domestic resources—for example through the adoption of a Medium-Term Revenue Strategy (MTRS)—is critical for maintaining macroeconomic stability, while satisfying the high spending needs currently faced by the government. It is also important to enhance debt management capacity by improving the information flow between different entities and strengthening the capacity of the Debt Management Unit (DMU) within the Ministry of Finance.

19. The authorities concurred on the importance of macroeconomic stability and debt sustainability in the medium term, but remain more optimistic than staff. They maintained that debt thresholds should be country- and context-specific and that Liberia's borrowing space is significantly larger than that estimated by staff. In particular, they remain more optimistic about medium-term growth and the return on investment from infrastructure projects.

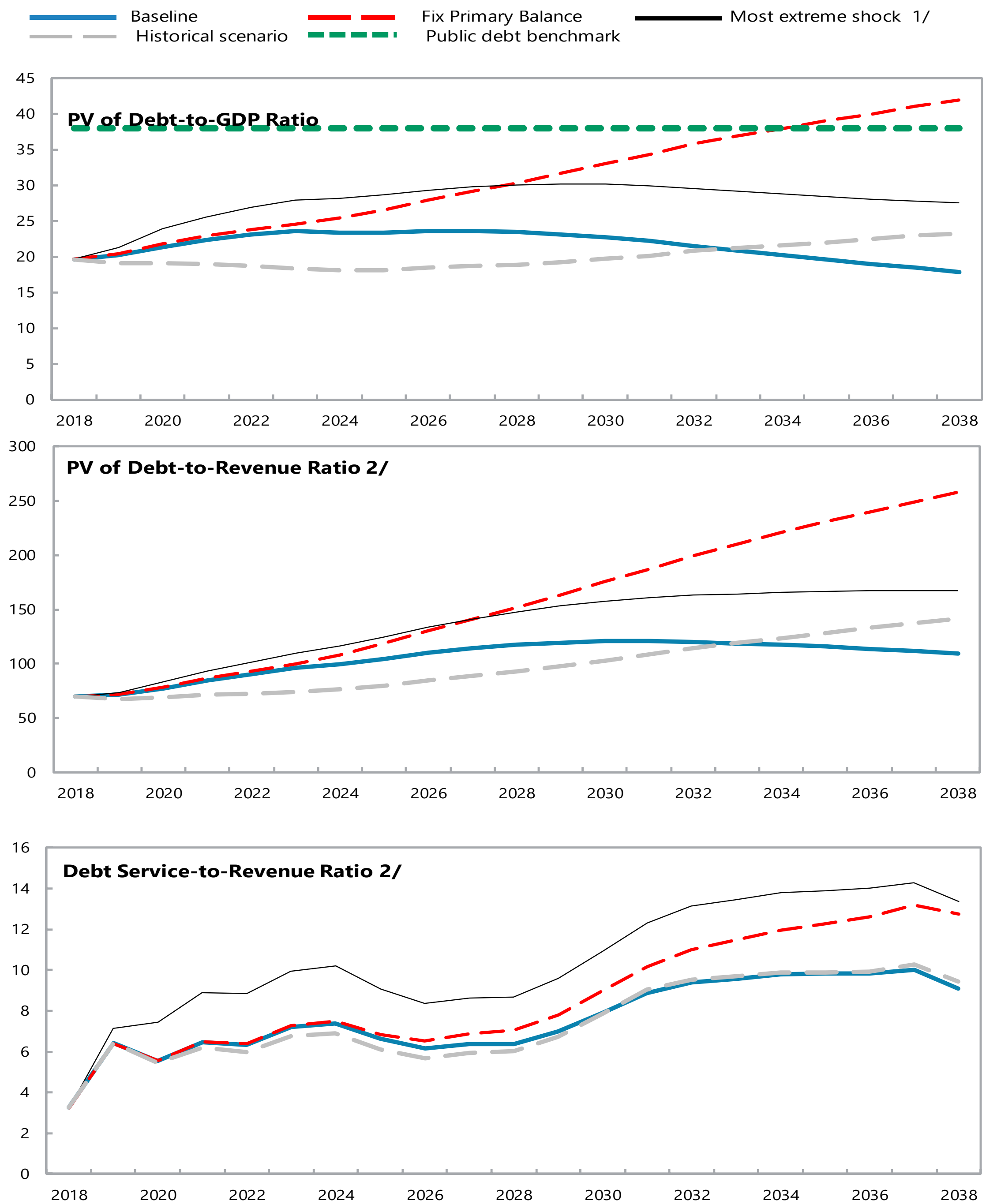
Figure 1. Liberia: Indicators of Public and Publicly Guaranteed External Debt Under Alternative Scenarios, 2018–38[1]



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 2028. In figure b. it corresponds to a Terms shock; in c. to a Terms shock; in d. to a Terms shock; in e. to a Exports shock and in figure f. to a One-time depreciation shock

Figure 2. Liberia: Indicators of Public Debt Under Alternative Scenarios, 2018–38[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 2028.
2/ Revenues are defined inclusive of grants.

Table 1. Liberia: External Debt Sustainability Framework, Baseline Scenario, 2015–38[1]

(Percent of GDP, unless otherwise indicated)

	Actual			Historical [6/]	Standard [6/]	Projections									
		0.0	0.0	0.0	Deviation							2018-2023			2024-2038
	2015	2016	2017			2018	2019	2020	2021	2022	2023	Average	2028	2038	Average
External debt (nominal) 1/	**14.6**	**19.0**	**25.0**			**28.2**	**31.1**	**33.2**	**35.3**	**37.0**	**37.9**		**38.7**	**27.3**	
of which: public and publicly guaranteed (PPG)	14.6	19.0	25.0			28.2	31.1	33.2	35.3	37.0	37.9		38.7	27.3	
Change in external debt	6.1	4.3	6.0			3.2	2.9	2.2	2.0	1.7	1.0		-0.3	-0.9	
Identified net debt-creating flows	7.4	5.9	6.4			6.3	5.5	4.7	4.0	3.5	2.9		0.4	-1.0	
Non-interest current account deficit	**26.7**	**22.3**	**20.7**	**20.8**	**3.0**	**21.9**	**22.1**	**22.2**	**22.1**	**21.1**	**20.0**		**14.6**	**9.6**	13.1
Deficit in balance of goods and services	61.5	55.3	43.5			35.0	31.8	28.9	27.5	26.1	24.7		20.2	14.5	
Exports	29.8	24.5	23.3			21.7	21.0	20.4	20.3	19.9	19.3		17.6	15.3	
Imports	91.3	79.9	66.8			56.8	52.8	49.3	47.8	46.1	44.0		37.8	29.8	
Net current transfers (negative = inflow)	-39.2	-39.3	-30.5	-46.1	13.4	-23.6	-23.0	-20.8	-19.3	-17.9	-16.4		-13.0	-8.3	-11.5
of which: official	-16.5	-17.7	-17.1			-15.4	-14.7	-13.4	-12.1	-10.9	-9.7		-7.4	-4.7	
Other current account flows (negative = net inflow)	4.4	6.2	7.7			10.5	13.3	14.1	13.9	12.9	11.7		7.4	3.4	
Net FDI (negative = inflow)	**-19.5**	**-16.0**	**-14.4**	**-16.7**	**1.7**	**-15.2**	**-15.6**	**-16.3**	**-16.7**	**-16.2**	**-15.6**		**-12.7**	**-9.5**	-11.9
Endogenous debt dynamics 2/	**0.2**	**-0.4**	**0.1**			**-0.5**	**-1.1**	**-1.2**	**-1.4**	**-1.5**	**-1.6**		**-1.5**	**-1.0**	
Contribution from nominal interest rate	0.1	0.1	0.2			0.3	0.2	0.2	0.2	0.2	0.2		0.3	0.3	
Contribution from real GDP growth	0.0	0.2	-0.5			-0.8	-1.3	-1.4	-1.6	-1.7	-1.8		-1.8	-1.4	
Contribution from price and exchange rate changes	0.1	-0.8	0.4			...	...	...	...	...	...		...	...	
Residual (3-4) 3/	**-1.3**	**-1.6**	**-0.4**			**-3.0**	**-2.6**	**-2.5**	**-1.9**	**-1.8**	**-1.9**		**-0.7**	**0.0**	
of which: exceptional financing	-0.6	-0.6	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
PV of external debt 4/	...	...	15.4			17.1	18.7	19.7	20.5	21.2	21.6		22.1	17.5	
In percent of exports	...	...	66.2			78.5	88.7	96.5	101.2	106.1	111.8		125.4	114.1	
PV of PPG external debt	**...**	**...**	**15.4**			**17.1**	**18.7**	**19.7**	**20.5**	**21.2**	**21.6**		**22.1**	**17.5**	
In percent of exports	**...**	**...**	**66.2**			**78.5**	**88.7**	**96.5**	**101.2**	**106.1**	**111.8**		**125.4**	**114.1**	
In percent of government revenues	**...**	**...**	**108.0**			**131.8**	**137.3**	**138.9**	**141.6**	**143.9**	**145.5**		**149.2**	**117.7**	
Debt service-to-exports ratio (in percent)	**1.0**	**0.7**	**1.4**			**3.0**	**3.7**	**4.9**	**6.1**	**6.1**	**6.7**		**4.7**	**7.5**	
PPG debt service-to-exports ratio (in percent)	**1.0**	**0.7**	**1.4**			**3.0**	**3.7**	**4.9**	**6.1**	**6.1**	**6.7**		**4.7**	**7.5**	
PPG debt service-to-revenue ratio (in percent)	**2.1**	**1.2**	**2.3**			**5.0**	**5.7**	**7.0**	**8.5**	**8.3**	**8.7**		**5.7**	**7.8**	
Total gross financing need (Millions of U.S. dollars)	233.5	209.9	213.9			248.1	252.2	252.3	261.0	262.0	264.1		184.6	178.3	
Non-interest current account deficit that stabilizes debt ratio	20.7	18.0	14.7			18.7	19.3	20.0	20.1	19.4	19.1		14.9	10.5	
Key macroeconomic assumptions															
Real GDP growth (in percent)	0.0	-1.6	2.5	4.4	3.8	3.2	4.7	4.8	5.3	5.2	5.3	4.8	5.1	5.2	5.1
GDP deflator in US dollar terms (change in percent)	-0.7	5.7	-2.1	5.6	5.5	0.5	-2.4	1.9	1.5	2.6	3.3	1.2	2.7	1.9	2.6
Effective interest rate (percent) 5/	1.6	0.9	1.0	0.7	0.6	1.3	0.7	0.6	0.6	0.7	0.7	0.8	1.0	1.2	1.0
Growth of exports of G&S (US dollar terms, in percent)	-14.8	-14.5	-4.5	5.3	18.9	-3.3	-1.1	3.4	6.3	6.1	5.3	2.8	6.3	5.6	6.2
Growth of imports of G&S (US dollar terms, in percent)	10.4	-9.1	-16.1	3.1	12.8	-11.8	-4.8	-0.4	3.5	4.1	3.9	-0.9	6.0	5.1	5.1
Grant element of new public sector borrowing (in percent)	...	...	...	...	...	50.6	50.1	52.2	52.9	53.5	50.4	51.6	54.0	37.1	46.4
Government revenues (excluding grants, in percent of GDP)	14.0	14.0	14.3			12.9	13.6	14.2	14.5	14.7	14.8		14.8	14.8	14.8
Aid flows (in Millions of US dollars) 7/	500.8	623.6	648.3			629.3	653.1	681.6	671.8	682.6	685.6		550.5	421.3	
of which: Grants	500.8	623.6	541.6			512.9	506.6	494.0	468.7	461.9	448.9		347.4	208.0	
of which: Concessional loans	0.0	0.0	106.8			116.5	146.5	187.6	203.1	220.7	236.7		203.1	213.4	
Grant-equivalent financing (in percent of GDP) 8/	...	...	...			17.6	17.1	16.1	14.7	13.7	12.3		6.8	2.1	5.3
Grant-equivalent financing (in percent of external financing) 8/	...	...	...			88.5	87.7	86.9	85.8	85.0	82.9		83.0	65.2	77.0
Memorandum items:															
Nominal GDP (Millions of US dollars)	3110.4	3233.0	3244.7			3367.1	3441.8	3676.3	3926.8	4236.0	4609.1		6763.6	14370.6	
Nominal dollar GDP growth	-0.7	3.9	0.4			3.8	2.2	6.8	6.8	7.9	8.8	6.1	7.9	7.1	7.9
PV of PPG external debt (in Millions of US dollars)			455.1			533.0	615.6	699.5	781.6	871.7	973.2		1474.5	2470.2	
(PVt-PVt-1)/GDPt-1 (in percent)						2.4	2.5	2.4	2.2	2.3	2.4	2.4	1.7	0.8	1.3
Gross workers' remittances (Millions of US dollars)	544.2	582.5	560.8			570.6	580.6	609.2	636.4	663.1	690.1		845.1	1237.0	
PV of PPG external debt (in percent of GDP + remittances)	...	...	13.2			14.6	16.0	16.9	17.6	18.3	18.8		19.7	16.1	
PV of PPG external debt (in percent of exports + remittances)	...	...	38.0			44.1	49.2	53.2	56.2	59.4	63.0		73.4	73.0	
Debt service of PPG external debt (in percent of exports + remittances)	...	...	0.8			1.7	2.0	2.7	3.4	3.4	3.8		2.8	4.8	

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. Liberia: Sensitivity Analysis for Key Indicators of Public and Publicly Guaranteed External Debt, 2018–38[1]

(Percent)

	Projections							
	2018	2019	2020	2021	2022	2023	**2028**	2038
PV of debt-to GDP ratio								
Baseline	17	19	20	21	21	22	**22**	17
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2018-2038 1/	17	16	16	16	16	16	**21**	24
A2. New public sector loans on less favorable terms in 2018-2038 2	17	19	22	24	26	28	**32**	29
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2019-2020	17	19	21	22	22	23	**24**	19
B2. Export value growth at historical average minus one standard deviation in 2019-2020 3/	17	19	23	23	24	24	**24**	17
B3. US dollar GDP deflator at historical average minus one standard deviation in 2019-2020	17	17	19	20	20	21	**22**	17
B4. Net non-debt creating flows at historical average minus one standard deviation in 2019-2020 4/	17	14	10	11	12	13	**17**	17
B5. Combination of B1-B4 using one-half standard deviation shocks	17	10	4	5	6	7	**13**	17
B6. One-time 30 percent nominal depreciation relative to the baseline in 2019 5/	17	26	27	29	30	30	**31**	25
PV of debt-to-exports ratio								
Baseline	78	89	97	101	106	112	**125**	114
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2018-2038 1/	78	77	79	78	80	85	**120**	157
A2. New public sector loans on less favorable terms in 2018-2038 2	78	92	108	120	132	145	**181**	190
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2019-2020	78	85	93	98	103	109	**123**	112
B2. Export value growth at historical average minus one standard deviation in 2019-2020 3/	78	104	152	158	164	173	**185**	155
B3. US dollar GDP deflator at historical average minus one standard deviation in 2019-2020	78	85	93	98	103	109	**123**	112
B4. Net non-debt creating flows at historical average minus one standard deviation in 2019-2020 4/	78	65	50	56	62	69	**95**	111
B5. Combination of B1-B4 using one-half standard deviation shocks	78	49	20	27	35	43	**82**	123
B6. One-time 30 percent nominal depreciation relative to the baseline in 2019 5/	78	85	93	98	103	109	**123**	112
PV of debt-to-revenue ratio								
Baseline	132	137	139	142	144	145	**149**	118
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2018-2038 1/	132	119	113	110	109	110	**143**	162
A2. New public sector loans on less favorable terms in 2018-2038 2	132	142	155	167	179	189	**216**	196
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2019-2020	132	137	145	149	151	154	**159**	125
B2. Export value growth at historical average minus one standard deviation in 2019-2020 3/	132	140	160	162	163	164	**161**	116
B3. US dollar GDP deflator at historical average minus one standard deviation in 2019-2020	132	128	133	136	139	141	**146**	115
B4. Net non-debt creating flows at historical average minus one standard deviation in 2019-2020 4/	132	101	73	79	84	90	**113**	114
B5. Combination of B1-B4 using one-half standard deviation shocks	132	71	25	34	42	49	**86**	112
B6. One-time 30 percent nominal depreciation relative to the baseline in 2019 5/	132	190	194	198	202	205	**212**	167

Table 2. Liberia: Sensitivity Analysis for Key Indicators of Public and Publicly Guaranteed External Debt, 2018–38 (Concluded)

(Percent)

Debt service-to-exports ratio								
Baseline	3	4	5	6	6	7	**5**	8
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2018-2038 1/	3	3	4	5	5	5	**3**	9
A2. New public sector loans on less favorable terms in 2018-2038 2	3	4	5	7	7	8	**7**	12
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2019-2020	3	4	5	6	6	7	**5**	8
B2. Export value growth at historical average minus one standard deviation in 2019-2020 3/	3	4	7	9	9	10	**9**	11
B3. US dollar GDP deflator at historical average minus one standard deviation in 2019-2020	3	4	5	6	6	7	**5**	8
B4. Net non-debt creating flows at historical average minus one standard deviation in 2019-2020 4/	3	4	4	5	5	6	**1**	5
B5. Combination of B1-B4 using one-half standard deviation shocks	3	4	4	5	5	6	**-2**	4
B6. One-time 30 percent nominal depreciation relative to the baseline in 2019 5/	3	4	5	6	6	7	**5**	8
Debt service-to-revenue ratio								
Baseline	5	6	7	9	8	9	**6**	8
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2018-2038 1/	5	5	6	7	7	7	**4**	9
A2. New public sector loans on less favorable terms in 2018-2038 2	5	6	7	10	10	10	**9**	12
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2019-2020	5	6	8	9	9	9	**6**	8
B2. Export value growth at historical average minus one standard deviation in 2019-2020 3/	5	6	7	9	9	9	**7**	9
B3. US dollar GDP deflator at historical average minus one standard deviation in 2019-2020	5	6	7	8	8	9	**6**	8
B4. Net non-debt creating flows at historical average minus one standard deviation in 2019-2020 4/	5	6	6	7	7	7	**1**	6
B5. Combination of B1-B4 using one-half standard deviation shocks	5	5	6	6	6	6	**-2**	4
B6. One-time 30 percent nominal depreciation relative to the baseline in 2019 5/	5	8	10	12	12	13	**8**	11
Memorandum item:								
Grant element assumed on residual financing (i.e., financing required above baseline) 6/	55	55	55	55	55	55	**55**	55

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. Liberia: Public Sector Debt Sustainability Framework, Baseline Scenario, 2015–38

(Percent of GDP, fiscal year, unless otherwise indicated)

	Actual					Estimate	Projections								
	2015	2016	2017	Average 5/	Standard Deviation 5/	2018	2019	2020	2021	2022	2023	2018-23 Average	2028	2038	2024-38 Average
Public sector debt 1/	16.0	19.3	27.1			30.7	32.0	33.9	35.8	37.6	38.4		38.8	27.3	
of which: foreign-currency denominated	15.2	19.3	25.3			28.7	31.6	33.8	35.8	37.5	38.3		38.7	27.3	
Change in public sector debt	5.4	3.4	7.8			3.5	1.3	1.9	1.9	1.8	0.8		-0.3	-1.1	
Identified debt-creating flows	6.2	2.9	5.5			3.4	3.3	2.4	2.6	2.3	1.1		-0.8	-1.5	
Primary deficit	6.1	2.5	4.6	1.7	2.1	4.8	4.4	4.4	4.5	4.6	4.1	4.5	1.8	0.1	0.8
Revenue and grants	30.1	33.3	31.0			28.2	28.3	27.6	26.4	25.6	24.6		20.0	16.3	
of which: grants	16.1	19.3	16.7			15.2	14.7	13.4	11.9	10.9	9.7		5.1	1.4	
Primary (noninterest) expenditure	36.2	35.8	35.6			33.0	32.7	32.0	31.0	30.3	28.7		21.7	16.4	
Automatic debt dynamics	0.1	0.4	0.9			-1.4	-1.1	-1.9	-2.0	-2.4	-3.0		-2.5	-1.6	
Contribution from interest rate/growth differential	0.0	0.2	-0.6			-1.3	-1.5	-1.8	-2.0	-2.1	-2.3		-2.3	-1.6	
of which: contribution from average real interest rate	0.0	-0.1	-0.1			-0.5	-0.1	-0.3	-0.3	-0.3	-0.4		-0.4	-0.2	
of which: contribution from real GDP growth	0.0	0.3	-0.5			-0.9	-1.4	-1.5	-1.7	-1.8	-1.9		-1.9	-1.4	
Contribution from real exchange rate depreciation	0.0	0.2	1.5			-0.1	0.4	-0.2	0.1	-0.3	-0.7		...	...	
Other identified debt-creating flows	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Privatization receipts (negative)	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Recognition of implicit or contingent liabilities	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Debt relief (HIPC and other)	0.0	0.0	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	-0.7	0.5	2.3			0.1	-2.0	-0.5	-0.6	-0.5	-0.3		0.4	0.4	
Other Sustainability Indicators															
PV of public sector debt	...	...	17.6			19.6	19.6	20.3	21.1	21.8	22.1		22.3	17.5	
of which: foreign-currency denominated	...	...	15.8			17.6	19.2	20.2	21.0	21.7	21.9		22.1	17.5	
of which: external	...	...	15.4			17.1	18.7	19.7	20.5	21.2	21.6		22.1	17.5	
PV of contingent liabilities (not included in public sector debt)	...	...	...			...	...	...	...	...	...		...	...	
Gross financing need 2/	7.0	3.7	5.0			7.3	8.0	6.2	6.4	6.3	6.0		3.1	1.7	
PV of public sector debt-to-revenue and grants ratio (in percent)	...	...	56.8			69.4	69.1	73.6	79.8	85.1	89.8		111.5	107.2	
PV of public sector debt-to-revenue ratio (in percent)	...	...	123.1			151.0	144.0	143.6	145.6	148.2	148.9		150.2	117.7	
of which: external 3/	...	...	108.0			131.8	137.3	138.9	141.6	143.9	145.5		149.2	117.7	
Debt service-to-revenue and grants ratio (in percent) 4/	1.8	1.3	1.2			3.3	6.5	5.6	6.4	6.2	7.1		6.3	8.8	
Debt service-to-revenue ratio (in percent) 4/	3.9	3.2	2.7			7.2	13.6	11.0	11.6	10.9	11.8		8.4	9.7	
Primary deficit that stabilizes the debt-to-GDP ratio	0.6	-0.8	-3.2			1.3	3.1	2.4	2.6	2.9	3.3		2.1	1.2	
Key macroeconomic and fiscal assumptions															
Real GDP growth (in percent)	0.0	-1.6	2.5	4.4	3.8	3.2	4.7	4.8	5.3	5.2	5.3	4.8	5.1	5.2	5.1
Average nominal interest rate on forex debt (in percent)	1.9	1.2	1.1	0.9	0.7	1.3	1.1	1.0	0.9	0.9	0.8	1.0	1.0	1.2	1.0
Average real interest rate on domestic debt (in percent)	-2.9	-8.8	-6.0	-4.8	4.1	-13.6	14.1	16.9	9.6	10.1	5.5	7.1	2.5	...	2.1
Real exchange rate depreciation (in percent, + indicates depreciation)	0.5	1.3	7.9	-2.4	6.6	-0.4	...	...	...	...	...	...	...	...	...
Inflation rate (GDP deflator, in percent)	4.6	11.6	12.3	11.1	6.2	17.4	9.0	10.0	8.1	8.7	8.6	10.3	5.9	5.0	5.8
Growth of real primary spending (deflated by GDP deflator, in percent)	21.9	-2.9	1.9	2.3	7.0	-4.2	3.7	2.4	2.0	2.8	-0.2	1.1	1.1	4.7	1.3
Grant element of new external borrowing (in percent)	...	...	...	...	...	50.6	50.1	52.2	52.9	53.5	50.4	51.6	54.0	37.1	...

Sources: Country authorities; and staff estimates and projections.

1/ The public sector debt in DSA covers the central budgetary government's gross debt.

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. Liberia: Sensitivity Analysis for Key Indicators of Public Debt, 2018–34

(Percent)

		Projections						
	2018	2019	2020	2021	2022	2023	2025	2034
PV of Debt-to-GDP Ratio								
Baseline	20	20	20	21	22	22	22	17
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	20	18	18	18	17	17	17	23
A2. Primary balance is unchanged from 2018	20	20	21	22	22	23	29	42
A3. Permanently lower GDP growth 1/	20	20	21	22	23	24	27	31
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2019-2020	20	21	23	24	25	26	29	27
B2. Primary balance is at historical average minus one standard deviations in 2019-2020	20	19	20	21	21	22	22	17
B3. Combination of B1-B2 using one half standard deviation shocks	20	19	20	21	22	23	24	22
B4. One-time 30 percent real depreciation in 2019	20	27	26	25	25	24	22	19
B5. 10 percent of GDP increase in other debt-creating flows in 2019	20	24	25	25	26	26	26	19
PV of Debt-to-Revenue Ratio 2/								
Baseline	69	69	74	80	85	90	112	107
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	69	65	65	66	67	67	86	138
A2. Primary balance is unchanged from 2018	69	70	75	82	88	94	146	255
A3. Permanently lower GDP growth 1/	69	70	75	82	89	95	132	186
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2019-2020	69	71	79	88	96	104	141	165
B2. Primary balance is at historical average minus one standard deviations in 2019-2020	69	68	72	78	83	88	110	106
B3. Combination of B1-B2 using one half standard deviation shocks	69	67	70	77	84	90	120	132
B4. One-time 30 percent real depreciation in 2019	69	94	94	96	97	98	112	114
B5. 10 percent of GDP increase in other debt-creating flows in 2019	69	86	90	96	102	106	128	119
Debt Service-to-Revenue Ratio 2/								
Baseline	3	7	6	6	6	7	6	9
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	3	7	6	6	6	7	6	9
A2. Primary balance is unchanged from 2018	3	7	6	6	6	7	7	12
A3. Permanently lower GDP growth 1/	3	7	6	6	6	7	7	12
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2019-2020	3	7	6	7	7	8	7	11
B2. Primary balance is at historical average minus one standard deviations in 2019-2020	3	7	6	6	6	7	6	9
B3. Combination of B1-B2 using one half standard deviation shocks	3	7	6	6	6	7	7	10
B4. One-time 30 percent real depreciation in 2019	3	7	8	9	9	10	8	13
B5. 10 percent of GDP increase in other debt-creating flows in 2019	3	7	6	7	7	7	7	10

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.