INTERNATIONAL MONETARY FUND

REPUBLIC OF YEMEN

STAFF REPORT FOR THE 2013 ARTICLE IV CONSULTATION—DEBT SUSTAINABILITYANALYSIS

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Based on the updated Debt Sustainability Analysis (DSA) reflecting the most recent information, Yemen's risk of debt distress is upgraded from "high" to "moderate." The improved debt outlook reflects updated projections of hydrocarbon exports in view of the low depletion rates of recent years and official proven reserves figures, which are consistent with data published by well established sources.[1] All the relevant debt indicators are below the policy-dependent thresholds in the baseline scenario. One indicator, however, breaches the threshold in the stress scenario. Specifically, Yemen remains vulnerable to less favorable borrowing terms and to an abrupt decrease in exports, possibly associated with a sharp decrease in oil prices.

[1] This DSA updates the previous DSA prepared for the staff report for request for RCF (EBS/12/37), Supplement 1).

BACKGROUND

1. **Yemen's public external debt-to-GDP is at a relatively low level of 17.9 percent of GDP as of end-2012.** The external borrowing by the private sector is currently negligible, and the debt sustainability analysis mainly includes public debt. The stock of public external debt is moderate partly due to Yemen's limited access to non-concessional borrowing.

2. **Yemen's external debt is owed mostly to official creditors and the stock of debt is mostly concessional.** Of the total external debt of $6.2 billion, half is owed to multilateral creditors.[2] The other half is owed to bilateral creditors, with the largest creditors being Russia ($1.2 billion), Saudi Arabia ($0.4 billion), Japan ($0.3 billion), and Kuwait ($0.2 billion). Regional donors have played an important role in providing assistance in 2012.

3. **In August 2012, the Friends of Yemen pledged around $8 billion dollars in aid for the period 2012-2014**. These figures do not include the exceptional $2 billion grant provided in 2012 by Saudi Arabia in support of the budget. Of the Friends of Yemen pledges, the amount committed thus far—i.e., already allocated by donors to specific projects—is $6 billion, and the amount disbursed so far is about $1.8 billion (including the $1 billion Saudi deposit at the central bank). However, most of these pledges are for project financing which are not part of the government budget.

4. **Yemen has borrowed more recently on some non-concessional terms from the Arab Monetary Fund to address imminent budget financing needs.** Total borrowing from the AMF has risen from around $99 million at end 2010 to about $260 million, and an additional $100 million loan was signed and disbursed in 2013. Other regional organizations, including the Arab Fund for Economic and Social Development and Islamic Development Bank, have also stepped up their efforts soon after the GCC-brokered deal was agreed and the interim government established in December 2011. Given that the total amount of loans is relatively small compared to GDP and that they carry a high grant element, these loans would not affect debt sustainability.

5. **This DSA updates the 2011 DSA (EBS/12/37—Supp. 1; 3/22/12)**. It incorporates more recent macroeconomic data including new data on oil and gas exports, actual debt data, and recent WEO projections of key economic variables, including international oil and gas prices. In addition, the assumption that oil exports will stop suddenly within several years has been replaced by the assumption that they decline steadily at a rate of about 3 percent a year.

6. **The Yemeni authorities' agreed with the staff's assessment.** The staff however cautioned against the downside risks, especially in view of the projected decline, albeit gradual, in oil revenues and the risk of a deterioration in the fiscal and external accounts, in case of slippages in the policy stance, in addition to the high vulnerability to adverse economic developments highlighted by the stress tests.

[2] Excluding the Saudi deposit at the CBY of $1 billion.

MACROECONOMIC ASSUMPTIONS

7. The baseline macroeconomic framework underlying the DSA is broadly the same as the previous one, except for oil production and exports as explained above. Detailed assumptions are discussed below (Box 1).

Box 1. Assumptions for the Macroeconomic Framework

Growth: In the medium term (2013–18), real GDP growth averages about 4.1 percent, which is slightly lower than the 10-year historical average before the political turmoil (4.3 percent), reflecting the recent political settlement, increased international assistance, restoration of activities, and revitalization of idle production capacity. It converges to average 4.5 percent over the long term (2019–33). Given the gradually declining oil production, non-hydrocarbon growth is essential and requires increased credit to the private sector. The recent cuts in the policy interest rate were a good move and further cuts in interest rates are envisaged as inflation and exchange rates stabilize. The interim government would gradually conduct structural reforms to improve the investment environment, including security conditions, and attract sizeable donor-funded public investment. Revitalization of the domestic debt market, including further issuance of Sukuk, and reprioritization of expenditures should support infrastructure investment, boosting non-hydrocarbon growth. The assumptions that non-hydrocarbon growth rates average 4.4 percent in the medium term (2013–18) and 4.7 percent in the long term, are basically in line with the historical experience: the sector grew at an average rate of 4.9 percent during 2001–10 before the political crisis.

Hydrocarbon Sector: One of the key changes in the assumptions is that oil production continues towards the end of the projection period rather than being depleted in 2022, in line with the revised authorities' projections. The above revision is also consistent with the assessment of credible independent sources (e.g. British Petroleum Oil Statistics, Oil & Gas Journal, and Economic Intelligence Unit), which put Yemen's proven oil reserves at about 3 billion barrels. Assuming a recovery in oil production over the medium- term, and subsequent declines of three percent per year over the long-term, Yemen would use only about half of the proven reserves by 2033. Yemen has a large potential in the LNG sector too. This DSA assumes no increase in LNG over the medium-term and a gradual average annual increase of 5 percent from 2019 onwards.

Inflation: Inflation stays relatively high but remains at the single digit in the medium term, due to continued fiscal pressure and recovery of economic activities. It moderates afterwards to an average of 6.8 percent in the long term assuming stable international food and fuel prices and that the central bank refrains from financing the government budget and continues to stabilize the real exchange rate.

Public finance: After experiencing a relatively large fiscal deficit of around 5.8 percent of GDP in 2013, fiscal adjustment continues over the projection period. An increase in non oil revenues, through recently introduced General Sales Tax and strengthening of tax and customs administration, partly offsets a gradual decrease in oil revenues. Total revenues (excluding grants) over GDP ratio hovers around 20 percent. On the expenditure side, expenditure restraints, including moderate efforts to control the public wage bill and fuel subsidies. These expenditure controls are broadly in line with projected real GDP growth, which would allow overall expenditures to decline from 33.0 percent in 2013 to 22.1 percent in 2033. As a result, the overall fiscal deficit over GDP gradually declines to around 2.2 percent in 2033.

External sector: Exports are expected to decrease in the medium term reflecting declining oil productions. However, a gradual increase in non-oil exports and, more importantly, in LNG exports is to offset a decrease in oil exports in the long run. Non-hydrocarbon exports growth would be around 5.9 percent in the medium term after a large decline during the crisis, and then stabilize at around 6.0 percent in the long run. Import growth is modest at average 2.8 percent over the projection period, reflecting moderate fiscal adjustment and imports substitution. The current account deficit would gradually increase to over 3.6 percent of GDP in the medium term but slowly worsen over the projection period. Official creditors, broadly consistent with commitments made in the Friend of Yemen meeting, are expected to resume providing financing on favorable terms, mainly in the form of grants. Improved security conditions and business environment would attract more foreign direct investment and allow for more commercial borrowing.

DEBT SUSTAINABILITY ANALYSIS

A. External DSA

Baseline

8. Under the baseline scenario all debt indicators are below the policy-dependent thresholds over the projection period. However, the PV of debt-to-exports ratio is the only indicator that rises close to the threshold over the long term, but does not at any time exceed it through the end of the projection in 2033.

Stress tests and alternative scenarios

9. Under the alternative scenarios and stress tests, all indicators remain below the policy-dependent thresholds with one exception. The PV of debt-to-export ratio under the most extreme shock quickly rises above the threshold of 100 percent starting in 2015, and peaking in 2023 at 180 percent (B2). This highlights Yemen's high dependence on oil exports for its long term external sustainability. However, the vulnerability to such a shock is expected to decline over the long term as the share of non-oil exports pick up.

B. Public DSA

10. Yemen's nominal debt-to-GDP ratio would exceed the 50 percent mark in 2015 and remains above it through 2020. This debt-to-GDP ratio would peak in 2018 at 58 percent and declines through the remainder of the projection period, reaching about 32.5 percent in 2033.

11. The alternative scenarios highlight the importance for Yemen to embark on a fiscal consolidation path. The PV of public debt to GDP is vulnerable to growth shocks (A3) (B1).

CONCLUSION

12. Based on the updated macroeconomic assumptions and ongoing reforms, Yemen's risk of debt distress is upgraded to "medium" from "high." This reflects in particular the revised assumption on oil output beyond 2022.

Table 1a.Yemen, Republic of: Public Sector Debt Sustainability Framework, Baseline Scenario, 2010–2033

(In percent of GDP, unless otherwise indicated)

	Actual			Average 5/	Standard Deviation 5/	Estimate	Projections								
	2010	2011	2012			2013	2014	2015	2016	2017	2018	2013-18 Average	2023	2033	2019-33 Average
Public sector debt 1/	42.2	45.2	47.8			48.1	50.2	51.8	53.6	54.8	57.9		46.5	32.5	
of which: foreign-currency denominated	19.3	18.3	17.9			16.7	17.0	17.6	18.5	19.2	19.9		19.2	14.5	
Change in public sector debt	-7.7	3.0	2.6			0.3	2.1	1.6	1.8	1.2	3.1		-2.1	-0.6	
Identified debt-creating flows	-8.0	2.8	3.5			-0.7	1.9	1.4	1.6	0.9	2.7		-2.2	-0.5	
Primary deficit	1.6	0.2	0.9	1.6	3.4	1.2	1.5	1.4	1.5	1.3	2.8	1.6	-0.7	0.6	-0.3
Revenue and grants	26.0	25.0	29.9			27.2	26.9	25.9	24.8	24.7	23.4		21.5	19.8	
of which: grants	1.2	1.2	6.1			1.2	1.5	1.5	1.6	1.7	1.6		1.2	0.6	
Primary (noninterest) expenditure	27.7	25.2	30.8			28.4	28.4	27.3	26.3	26.0	26.2		20.8	20.4	
Automatic debt dynamics	-9.6	2.7	2.6			-1.8	0.4	0.0	0.1	-0.4	0.0		-1.5	-1.1	
Contribution from interest rate/growth differential	-6.1	5.7	2.9			-1.1	-0.1	-0.3	-0.3	-0.6	-0.4		-1.6	-1.1	
of which: contribution from average real interest rate	-2.6	-0.4	3.9			1.6	1.5	1.6	1.6	1.4	1.6		0.4	0.3	
of which: contribution from real GDP growth	-3.6	6.1	-1.1			-2.7	-1.6	-1.9	-1.9	-2.1	-1.9		-2.1	-1.4	
Contribution from real exchange rate depreciation	-3.5	-3.1	-0.3			-0.8	0.5	0.3	0.4	0.2	0.3		...	...	
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	0.3	0.1	-0.9			1.0	0.1	0.2	0.2	0.3	0.3		0.0	-0.1	
Other Sustainability Indicators															
PV of public sector debt	...	...	44.0			44.6	46.6	48.1	49.7	50.7	53.7		43.3	30.3	
of which: foreign-currency denominated	...	...	14.1			13.1	13.4	13.8	14.6	15.1	15.7		16.0	12.4	
of which: external	...	...	14.1			13.1	13.4	13.8	14.6	15.1	15.7		16.0	12.4	
PV of contingent liabilities (not included in public sector debt)	...	...	...			...	...	...	...	...	...		...	...	
Gross financing need 2/	4.6	5.0	6.9			6.3	6.4	6.5	6.4	5.9	7.0		2.5	2.8	
PV of public sector debt-to-revenue and grants ratio (in percent)	...	...	147.1			163.8	172.9	185.9	200.1	205.6	229.6		201.7	153.0	
PV of public sector debt-to-revenue ratio (in percent)	...	...	185.0			171.2	182.8	197.6	213.8	220.6	246.7		213.6	157.4	
of which: external 3/	...	...	59.2			50.4	52.6	56.8	62.7	65.8	72.2		78.8	64.3	
Debt service-to-revenue and grants ratio (in percent) 4/	11.5	19.3	20.1			18.9	18.4	19.4	19.8	18.6	18.2		14.6	11.0	
Debt service-to-revenue ratio (in percent) 4/	12.0	20.3	25.3			19.8	19.5	20.7	21.1	20.0	19.6		15.4	11.3	
Primary deficit that stabilizes the debt-to-GDP ratio	9.3	-2.8	-1.7			0.8	-0.6	-0.2	-0.3	0.1	-0.3		1.5	1.1	
Key macroeconomic and fiscal assumptions															
Nominal GDP (local currency)	6816.7	7083.1	7588.5			8870.1	9985.3	11249.9	12548.9	13966.8	15242.5		25867.7	75949.7	
Real GDP growth (in percent)	7.7	-12.7	2.4	2.5	5.5	6.0	3.4	3.9	3.8	4.0	3.7	4.1	4.4	4.5	4.5
Average nominal interest rate on public debt (in percent)	6.4	10.4	13.0	8.9	6.5	11.3	10.1	9.9	9.1	8.3	7.3	9.3	5.7	5.6	5.8
Average nominal interest rate on forex debt (in percent)	1.2	0.9	1.3	1.2	0.2	1.6	1.4	1.4	1.4	1.5	1.4	1.4	0.7	1.6	1.2
Average nominal interest rate on domestic debt (in percent)	11.5	18.4	20.9	17.7	3.1	17.0	14.7	14.2	12.9	11.9	10.5	13.5	9.0	9.0	9.1
Average real interest rate (in percent)	-5.6	-0.8	8.9	1.9	5.6	3.6	3.2	3.3	3.1	2.7	3.0	3.2	0.9	0.9	1.0
Average real interest rate on foreign-currency debt (in percent)	-1.9	-2.1	-2.0	-2.3	0.6	-2.1	-2.1	-2.1	-2.1	-2.1	-2.1	-2.1	-2.1	-2.1	-2.1
Average real interest rate on domestic debt (in percent)	-10.2	-0.5	15.6	6.1	11.7	6.1	5.3	5.3	5.1	4.5	5.0	5.2	2.4	2.2	2.4
Exchange rate (LC per US dollar)	213.8	213.8	215.9	201.4	11.3	222.4	244.7	264.1	285.2	302.2	317.3	272.6	404.9	659.6	466.3
Nominal depreciation of local currency (percentage change in LC per dollar)	3.1	0.0	1.0	1.9	1.7	3.0	10.0	7.9	8.0	6.0	5.0	6.6	5.0	5.0	5.0
Exchange rate (US dollar per LC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nominal appreciation (increase in US dollar value of local currency, in percer	-3.0	0.0	-1.0	-1.9	1.6	-2.9	-9.1	-7.4	-7.4	-5.6	-4.8	-6.2	-4.8	-4.8	-4.8
Real exchange rate depreciation (in percent, + indicates depreciation)	-15.3	-14.2	-1.4	-6.5	10.9	-4.6	...	...	...	...	...	...	...	...	...
Inflation rate (GDP deflator, in percent)	24.2	19.0	4.6	12.0	11.2	10.3	8.9	8.4	7.5	7.0	5.3	7.9	6.4	6.7	6.5
Growth of real primary spending (deflated by GDP deflator, in percent)	-0.1	-0.2	0.2	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Grant element of new external borrowing (in percent)	...	...	...	...	...	22.1	21.9	21.8	21.8	21.8	20.4	21.6	20.4	20.4	...

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 2a.Yemen, Republic of: Sensitivity Analysis for Key Indicators of Public Debt 2013–2033

(In percent)

	Projections							
	2013	2014	2015	2016	2017	2018	2023	2033
PV of Debt-to-GDP Ratio								
Baseline	45	47	48	50	51	54	43	30
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	45	47	50	52	54	57	62	70
A2. Primary balance is unchanged from 2013	45	46	48	49	50	51	50	46
A3. Permanently lower GDP growth 1/	45	47	50	53	56	61	62	85
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2014-2015	45	51	60	65	69	75	75	78
B2. Primary balance is at historical average minus one standard deviations in 2014-2015	45	50	55	56	57	60	49	35
B3. Combination of B1-B2 using one half standard deviation shocks	45	50	55	59	62	67	62	58
B4. One-time 30 percent real depreciation in 2014	45	53	54	56	57	59	49	37
B5. 10 percent of GDP increase in other debt-creating flows in 2014	45	56	58	59	60	63	51	36
PV of Debt-to-Revenue Ratio 2/								
Baseline	164	173	186	200	206	230	202	153
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	164	175	191	208	218	240	287	349
A2. Primary balance is unchanged from 2013	164	172	184	197	202	219	233	233
A3. Permanently lower GDP growth 1/	164	176	193	213	226	259	286	425
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2014-2015	164	190	230	259	277	319	347	393
B2. Primary balance is at historical average minus one standard deviations in 2014-2015	164	186	212	227	232	257	228	175
B3. Combination of B1-B2 using one half standard deviation shocks	164	185	213	236	249	283	286	290
B4. One-time 30 percent real depreciation in 2014	164	197	210	224	229	254	229	188
B5. 10 percent of GDP increase in other debt-creating flows in 2014	164	208	222	237	242	268	238	183
Debt Service-to-Revenue Ratio 2/								
Baseline	19	18	19	20	19	18	15	11
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	19	19	20	21	20	20	34	51
A2. Primary balance is unchanged from 2013	19	18	19	19	18	16	25	33
A3. Permanently lower GDP growth 1/	19	19	20	21	22	23	33	75
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2014-2015	19	20	23	28	33	37	50	67
B2. Primary balance is at historical average minus one standard deviations in 2014-2015	19	18	21	30	31	28	21	15
B3. Combination of B1-B2 using one half standard deviation shocks	19	19	22	27	27	30	35	43
B4. One-time 30 percent real depreciation in 2014	19	19	21	22	22	22	21	20
B5. 10 percent of GDP increase in other debt-creating flows in 2014	19	18	23	46	26	37	22	17

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.

Table 3a. External Debt Sustainability Framework, Baseline Scenario, 2010–2033 1/

(In percent of GDP, unless otherwise indicated)

	Actual			Historical 6/	Standard 6/	Projections									
				Average	Deviation							2013-2018			2019-2033
	2010	2011	2012			2013	2014	2015	2016	2017	2018	Average	2023	2033	Average
External debt (nominal) 1/	**21.1**	**20.4**	**20.3**			**19.2**	**20.2**	**21.6**	**23.3**	**24.6**	**26.2**		**27.9**	**22.5**	
of which: public and publicly guaranteed (PPG)	19.3	18.3	17.9			16.7	17.0	17.6	18.5	19.2	19.9		19.2	14.5	
Change in external debt	-5.0	-0.7	-0.1			-1.1	1.0	1.3	1.7	1.4	1.6		0.1	-0.9	
Identified net debt-creating flows	0.8	5.8	-1.3			3.6	4.5	4.5	3.9	3.3	2.6		3.4	0.4	
Non-interest current account deficit	**3.5**	**3.9**	**0.7**	**2.9**	**4.6**	**2.4**	**3.2**	**3.4**	**3.9**	**3.4**	**3.0**		**4.4**	**1.1**	3.2
Deficit in balance of goods and services	5.0	2.9	8.8			4.5	4.4	5.1	5.9	6.0	4.9		5.6	2.7	
Exports	29.8	29.9	26.5			26.4	25.9	24.9	23.7	23.9	23.3		18.7	16.1	
Imports	34.9	32.8	35.3			30.9	30.3	30.0	29.6	29.9	28.1		24.2	18.8	
Net current transfers (negative = inflow)	-6.8	-6.4	-12.4	-7.7	2.0	-6.8	-6.7	-6.8	-6.8	-7.0	-7.0		-6.2	-5.6	-6.0
of which: official	-2.1	-2.3	-6.2			-1.9	-1.8	-1.9	-2.0	-2.1	-2.0		-1.5	-0.6	
Other current account flows (negative = net inflow)	5.3	7.5	4.2			4.7	5.5	5.2	4.8	4.4	5.1		5.1	4.0	
Net FDI (negative = inflow)	**2.1**	**3.0**	**-1.0**	**-0.8**	**3.4**	**2.0**	**1.7**	**1.5**	**0.5**	**0.3**	**0.1**		**-0.3**	**-0.3**	-0.3
Endogenous debt dynamics 2/	**-4.7**	**-1.2**	**-1.1**			**-0.8**	**-0.4**	**-0.5**	**-0.4**	**-0.4**	**-0.4**		**-0.7**	**-0.4**	
Contribution from nominal interest rate	0.2	0.2	0.2			0.3	0.2	0.3	0.4	0.5	0.5		0.5	0.5	
Contribution from real GDP growth	-1.6	2.5	-0.5			-1.1	-0.6	-0.8	-0.8	-0.9	-0.9		-1.2	-1.0	
Contribution from price and exchange rate changes	-3.3	-3.8	-0.8			...	...	...	...	...	...		...	...	
Residual (3-4) 3/	**-5.8**	**-6.6**	**1.2**			**-4.7**	**-3.4**	**-3.1**	**-2.2**	**-1.9**	**-1.1**		**-3.3**	**-1.3**	
of which: exceptional financing	-0.3	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/	...	...	16.5			15.6	16.6	17.8	19.3	20.5	22.0		24.7	20.3	
In percent of exports	...	...	62.3			59.2	64.2	71.6	81.5	85.8	94.8		132.4	125.9	
PV of PPG external debt	**...**	**...**	**14.1**			**13.1**	**13.4**	**13.8**	**14.6**	**15.1**	**15.7**		**16.0**	**12.4**	
In percent of exports	**...**	**...**	**53.2**			**49.7**	**51.8**	**55.6**	**61.5**	**63.3**	**67.6**		**85.6**	**76.7**	
In percent of government revenues	**...**	**...**	**59.2**			**50.4**	**52.6**	**56.8**	**62.7**	**65.8**	**72.2**		**78.8**	**64.3**	
Debt service-to-exports ratio (in percent)	**2.8**	**2.6**	**3.0**			**3.0**	**3.4**	**3.7**	**4.4**	**4.4**	**4.6**		**5.9**	**6.5**	
PPG debt service-to-exports ratio (in percent)	**2.8**	**2.6**	**2.9**			**3.0**	**3.3**	**3.4**	**3.9**	**3.5**	**3.6**		**4.1**	**4.6**	
PPG debt service-to-revenue ratio (in percent)	**3.3**	**3.3**	**3.2**			**3.0**	**3.4**	**3.5**	**4.0**	**3.7**	**3.9**		**3.8**	**3.8**	
Total gross financing need (Billions of U.S. dollars)	2.0	2.6	0.2			2.1	2.5	2.6	2.5	2.2	2.0		3.4	2.3	
Non-interest current account deficit that stabilizes debt ratio	8.5	4.7	0.8			3.6	2.1	2.1	2.2	2.0	1.4		4.3	2.0	
Key macroeconomic assumptions															
Real GDP growth (in percent)	7.7	-12.7	2.4	2.5	5.5	6.0	3.4	3.9	3.8	4.0	3.7	4.1	4.4	4.5	4.5
GDP deflator in US dollar terms (change in percent)	14.7	22.3	4.3	10.2	10.9	7.9	2.2	-0.4	-0.4	0.1	-0.2	1.5	1.4	1.6	1.4
Effective interest rate (percent) 5/	1.2	0.9	1.2	1.2	0.3	1.4	1.4	1.5	1.7	2.1	2.1	1.7	1.8	2.5	2.2
Growth of exports of G&S (US dollar terms, in percent)	30.6	7.0	-5.5	6.6	21.7	14.2	3.5	-0.5	-1.6	5.1	0.5	3.5	4.4	4.1	3.5
Growth of imports of G&S (US dollar terms, in percent)	8.2	0.3	15.0	12.0	15.3	0.3	3.3	2.5	2.1	5.1	-2.6	1.8	3.5	3.3	3.2
Grant element of new public sector borrowing (in percent)	...	...	...	...	...	22.1	21.9	21.8	21.8	21.8	20.4	21.6	20.4	20.4	20.4
Government revenues (excluding grants, in percent of GDP)	24.8	23.8	23.8			26.0	25.5	24.4	23.2	23.0	21.8		20.3	19.3	20.1
Aid flows (in Billions of US dollars) 7/	0.7	0.5	2.5			0.6	0.8	0.9	1.0	1.1	0.8		0.8	0.7	
of which: Grants	0.4	0.4	2.2			0.5	0.6	0.7	0.7	0.8	0.8		0.8	0.7	
of which: Concessional loans	0.3	0.1	0.3			0.2	0.1	0.2	0.3	0.3	0.0		0.0	0.0	
Grant-equivalent financing (in percent of GDP) 8/	...	...	...			1.5	1.8	1.9	2.1	2.1	2.0		1.5	0.7	1.2
Grant-equivalent financing (in percent of external financing) 8/	...	...	...			56.9	62.9	57.3	54.9	56.3	56.8		56.3	52.8	54.6
Memorandum items:															
Nominal GDP (Billions of US dollars)	31.0	33.1	35.4			40.5	42.8	44.2	45.7	47.6	49.2		65.4	118.0	
Nominal dollar GDP growth	23.5	6.7	6.8			14.4	5.6	3.4	3.3	4.1	3.5	5.7	5.8	6.2	6.0
PV of PPG external debt (in Billions of US dollars)			4.9			5.2	5.5	5.9	6.4	7.0	7.6		10.2	14.3	
(PVt-PVt-1)/GDPt-1 (in percent)						0.8	0.6	1.0	1.2	1.3	1.2	1.0	0.9	0.3	0.7
Gross workers' remittances (Billions of US dollars)	1.6	1.4	2.3			2.1	2.1	2.3	2.3	2.5	2.6		3.3	6.2	
PV of PPG external debt (in percent of GDP + remittances)	...	...	13.2			12.5	12.8	13.2	13.9	14.4	14.9		15.2	11.8	
PV of PPG external debt (in percent of exports + remittances)	...	...	42.9			41.7	43.4	46.1	50.7	52.0	55.3		67.5	57.8	
Debt service of PPG external debt (in percent of exports + remittances)	...	...	2.4			2.5	2.8	2.8	3.3	2.9	3.0		3.2	3.4	

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 3b.Yemen, Republic of: Sensitivity Analysis for Key Indicators of Public and Publicly Guaranteed External Debt, 2013–2033

(In percent)

	Projections							
	2013	2014	2015	2016	2017	2018	**2023**	2033
PV of debt-to GDP ratio								
Baseline	13	13	14	15	15	16	**16**	12
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2013-2033 1/	13	10	7	6	5	5	**-1**	2
A2. New public sector loans on less favorable terms in 2013-2033 2	13	13	14	16	17	18	**20**	18
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2014-2015	13	14	15	16	17	17	**18**	14
B2. Export value growth at historical average minus one standard deviation in 2014-2015 3/	13	17	23	24	24	25	**24**	15
B3. US dollar GDP deflator at historical average minus one standard deviation in 2014-2015	13	13	14	14	15	16	**16**	12
B4. Net non-debt creating flows at historical average minus one standard deviation in 2014-2015 4/	13	14	17	17	18	18	**18**	13
B5. Combination of B1-B4 using one-half standard deviation shocks	13	14	16	17	17	18	**18**	13
B6. One-time 30 percent nominal depreciation relative to the baseline in 2014 5/	13	18	19	20	21	22	**22**	17
PV of debt-to-exports ratio								
Baseline	50	52	56	61	63	68	**86**	77
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2013-2033 1/	50	38	29	24	21	20	**-4**	14
A2. New public sector loans on less favorable terms in 2013-2033 2	50	51	57	66	70	77	**108**	113
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2014-2015	50	49	53	59	61	66	**83**	74
B2. Export value growth at historical average minus one standard deviation in 2014-2015 3/	50	78	132	142	144	152	**180**	131
B3. US dollar GDP deflator at historical average minus one standard deviation in 2014-2015	50	49	53	59	61	66	**83**	74
B4. Net non-debt creating flows at historical average minus one standard deviation in 2014-2015 4/	50	55	67	73	75	79	**98**	80
B5. Combination of B1-B4 using one-half standard deviation shocks	50	57	72	79	81	87	**107**	89
B6. One-time 30 percent nominal depreciation relative to the baseline in 2014 5/	50	49	53	59	61	66	**83**	74
PV of debt-to-revenue ratio								
Baseline	50	53	57	63	66	72	**79**	64
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2013-2033 1/	50	39	30	25	22	22	**-4**	12
A2. New public sector loans on less favorable terms in 2013-2033 2	50	52	58	67	73	83	**99**	95
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2014-2015	50	54	62	69	73	80	**88**	71
B2. Export value growth at historical average minus one standard deviation in 2014-2015 3/	50	65	94	102	105	114	**116**	77
B3. US dollar GDP deflator at historical average minus one standard deviation in 2014-2015	50	52	56	62	66	72	**79**	64
B4. Net non-debt creating flows at historical average minus one standard deviation in 2014-2015 4/	50	56	68	74	78	85	**90**	67
B5. Combination of B1-B4 using one-half standard deviation shocks	50	54	66	72	75	82	**88**	66
B6. One-time 30 percent nominal depreciation relative to the baseline in 2014 5/	50	71	77	85	90	100	**108**	88

Table 3b.Yemen, Republic of: Sensitivity Analysis for Key Indicators of Public and Publicly Guaranteed External Debt, 2013-2033 (continued)

(In percent)

				Debt service-to-exports ratio				
Baseline	3	3	3	4	4	4	**4**	5
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2013-2033 1/	3	3	3	3	2	2	**1**	0
A2. New public sector loans on less favorable terms in 2013-2033 2	3	3	3	4	4	4	**5**	7
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2014-2015	3	3	3	4	4	4	**4**	5
B2. Export value growth at historical average minus one standard deviation in 2014-2015 3/	3	4	5	7	6	6	**7**	10
B3. US dollar GDP deflator at historical average minus one standard deviation in 2014-2015	3	3	3	4	4	4	**4**	5
B4. Net non-debt creating flows at historical average minus one standard deviation in 2014-2015 4/	3	3	4	4	4	4	**4**	5
B5. Combination of B1-B4 using one-half standard deviation shocks	3	4	4	5	4	4	**5**	6
B6. One-time 30 percent nominal depreciation relative to the baseline in 2014 5/	3	3	3	4	4	4	**4**	5
				Debt service-to-revenue ratio				
Baseline	3	3	4	4	4	4	**4**	4
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2013-2033 1/	3	3	3	3	2	2	**1**	0
A2. New public sector loans on less favorable terms in 2013-2033 2	3	3	3	4	4	4	**5**	6
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2014-2015	3	4	4	5	4	4	**4**	4
B2. Export value growth at historical average minus one standard deviation in 2014-2015 3/	3	3	4	5	4	5	**4**	6
B3. US dollar GDP deflator at historical average minus one standard deviation in 2014-2015	3	3	4	4	4	4	**4**	4
B4. Net non-debt creating flows at historical average minus one standard deviation in 2014-2015 4/	3	3	4	4	4	4	**4**	4
B5. Combination of B1-B4 using one-half standard deviation shocks	3	3	4	4	4	4	**4**	4
B6. One-time 30 percent nominal depreciation relative to the baseline in 2014 5/	3	5	5	6	5	5	**5**	5
Memorandum item:								
Grant element assumed on residual financing (i.e., financing required above baseline) 6/	19	19	19	19	19	19	**19**	19

Sources: Country authorities; and staff estimates and projections.

1/ Variables include real GDP growth, growth of GDP deflator (in U.S. dollar terms), non-interest current account in percent of GDP, and non-debt creating flows.

2/ Assumes that the interest rate on new borrowing is by 2 percentage points higher than in the baseline., while grace and maturity periods are the same as in the baseline.

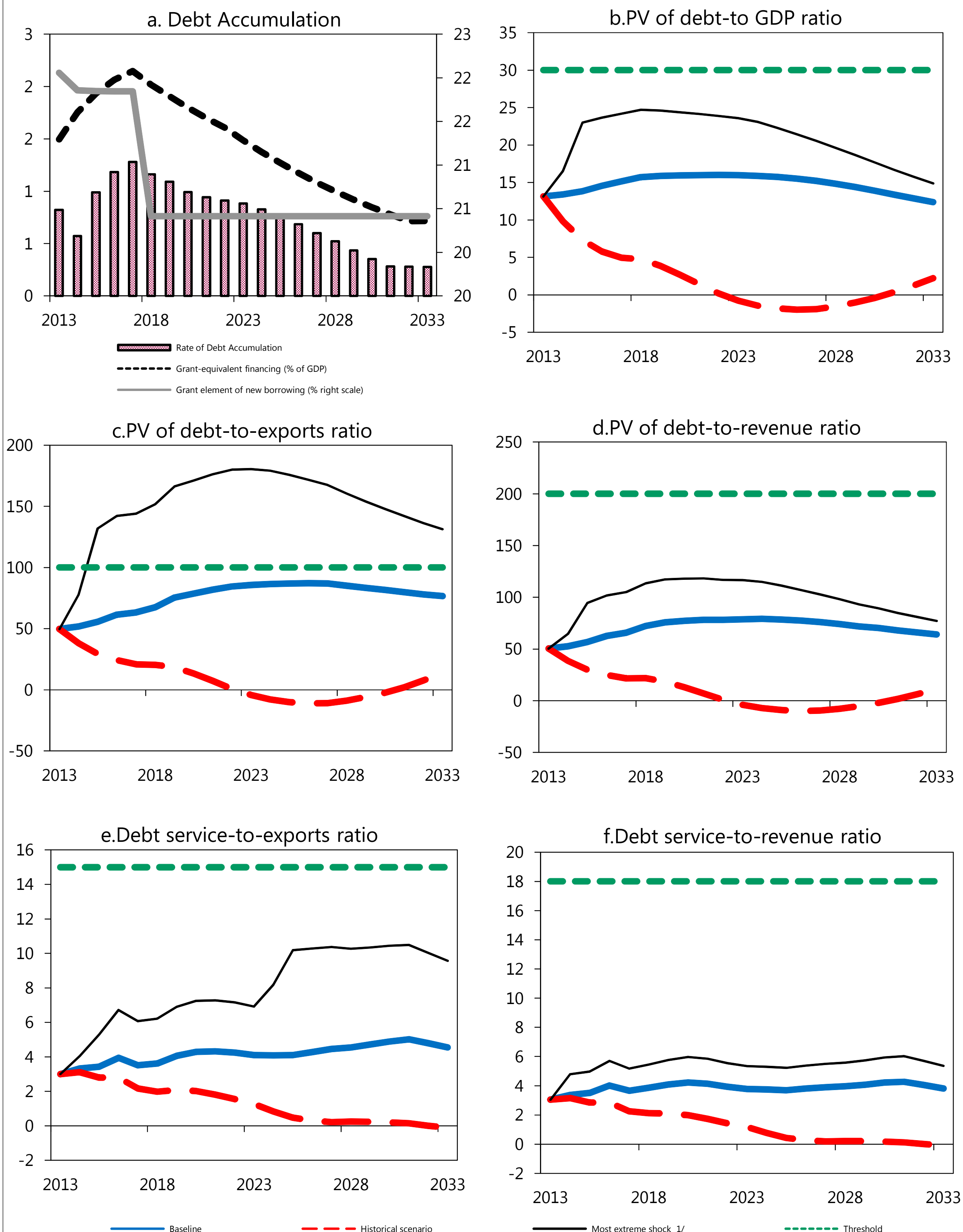
3/ Exports values are assumed to remain permanently at the lower level, but the current account as a share of GDP is assumed to return to its baseline level after the shock (implicitly assuming an offsetting adjustment in import levels).

4/ Includes official and private transfers and FDI.

5/ Depreciation is defined as percentage decline in dollar/local currency rate, such that it never exceeds 100 percent.

6/ Applies to all stress scenarios except for A2 (less favorable financing) in which the terms on all new financing are as specified in footnote 2.

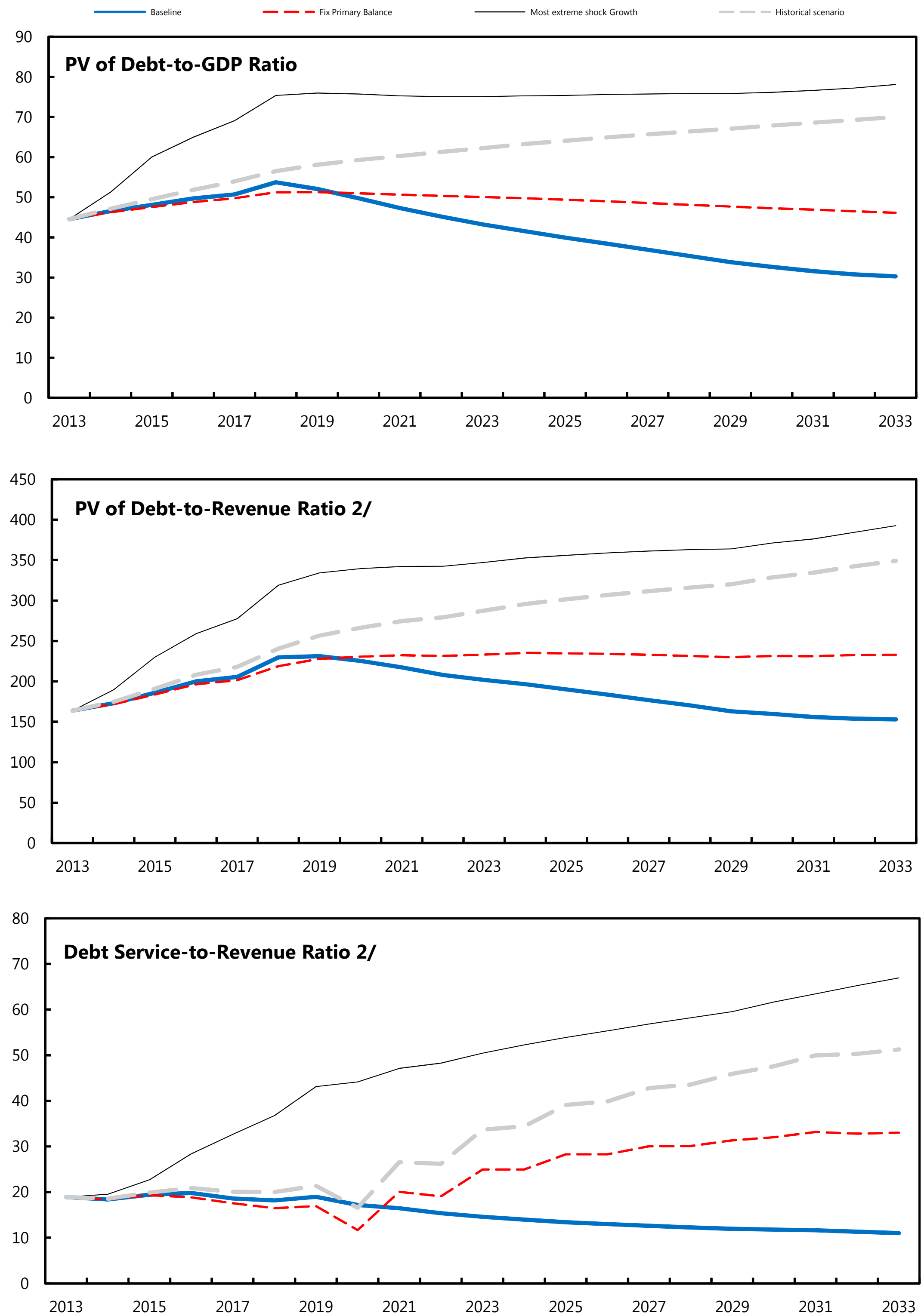
Figure 1. Yemen, Republic of: Indicators of Public and Publicly Guaranteed External Debt under Alternatives Scenarios, 2013-2033 1/



Sources: Country authorities; and staff estimates and projections.

1/ The most extreme stress test is the test that yields the highest ratio in 2023. In figure b. it corresponds to a Exports shock; in c. to a Exports shock; in d. to a Exports shock; in e. to a Exports shock and in figure f. to a One-time depreciation shock

Figure 2.Yemen, Republic of: Indicators of Public Debt Under Alternative Scenarios, 2013-2033 1/



Sources: Country authorities; and staff estimates and projections.
1/ The most extreme stress test is the test that yields the highest ratio in 2023.
2/ Revenues are defined inclusive of grants.