BANGLADESH

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SECOND REVIEW UNDER THE THREE-YEAR ARRANGEMENT UNDER THE EXTENDED CREDIT FACILITY AND REQUEST FOR MODIFICATION OF PERFORMANCE CRITERIA—DEBT SUSTAINABILITY ANALYSIS UPDATE

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This debt sustainability analysis (DSA) updates the joint IMF/IDA DSA from January 30, 2013, reflecting the most recent macroeconomic developments and borrowing needs.[1] In line with interim guidance, remittances have been added to three debt burden indicators and thresholds have been adjusted accordingly. As a result, these debt indicators are not directly comparable with those from previous DSAs. The results indicate that Bangladesh remains at a low risk of debt distress.[2]

1. **Main changes in assumptions.** Since the previous DSA update, conducted in the context of the first review under the Three-Year Arrangement under the Extended Credit Facility, key updates are:[3]

- **Growth.** Real GDP growth for the FY13–18 period has been marked down to an annual average of 6.3 percent (compared to 6.8 percent in the previous DSA) given the weaker domestic and global environment. Revisions to long-term assumptions are minor. All growth projections assume that the authorities are pursuing policies that maintain macroeconomic stability, promote broad-ranging structural reforms, and strengthen the trade and investment climate.

- **Primary fiscal deficit.** Over the medium term (FY13–18), the primary fiscal deficit is lower than in the previous DSA by 0.2 percent of GDP a year on average, reflecting a revised capital spending profile under the Annual Development Program.

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[1] In line with the 2010 Staff Guidance Note, a full joint LIC DSAs is expected to be prepared once every three years for PRGT-eligible IDA-only countries. In between, short annual updates are expected to be produced unless macroeconomic conditions since the last full DSA have significantly changed. See *Staff Guidance Note on the Application of the Joint Fund-Bank Debt Sustainability Framework for Low-Income Countries* (www.imf.org) and IDA/SECM2010-0029.

[2] The DSA presented in this document is based on the standard low-income countries (LIC) DSA framework. See *Debt Sustainability in Low-Income Countries: Further Considerations on an Operational Framework, Policy Implications* (www.imf.org) and IDA/SECM2004/0629. Under the Country Policy and Institutional Assessment (CPIA), Bangladesh is rated as a medium performer, with an average rating of 3.43 during 2009–11, and the DSA uses the indicative threshold for countries in this category.

[3] IMF Country Report No. 13/61 (March 2013).

- **External borrowing.** While the time profile of external borrowing is slightly revised, total amounts remain essentially unchanged.[4]

- **Domestic borrowing.** The definition of domestic borrowing has been extended to include domestic bank borrowing by SOEs, which corresponded to 1.4 percent of GDP at end-FY12. This stock is assumed to remain constant at 1.4 percent of GDP over the medium and long term.

BASELINE SCENARIO

2. **External debt.** The present value (PV) of external debt-to-GDP is expected to fall over the long run to 14 percent by FY33. While all external debt indicators remain well below the policy-dependent debt burden thresholds under the baseline scenario, the debt service-to-revenue ratio would exceed the 20 percent threshold in FY14 in the case of a one-time 30 percent nominal depreciation relative to the baseline in FY14. However, the breach is temporary and caused by maturing short-term oil-related suppliers' credits, most of which are expected to be rolled over and refinanced by new short-term credits.

3. **Public sector debt.** The PV of public sector debt-to-GDP ratio is projected to remain broadly constant over the next five years and then fall gradually to 30 percent of GDP by FY33. In addition to the risks tested in the scenario analysis, contingent fiscal liabilities arising from potential recapitalization costs for state-owned commercial banks (SOCBs) could materialize, leading to an increase in debt ratios.[5]

ALTERNATIVE SCENARIO

4. **Alternative assumptions and outcome.** The alternative scenario (Figure 3 and Table 6) assumes that (i) a sovereign bond, which the authorities have been considering for some time, is issued in FY14 for a total amount of US$1 billion with a 10-year maturity and (ii) Bangladesh proceeds with new nonconcessional borrowing of US$6 billion to construct two 1,000 megawatt nuclear reactors during FY17–21, with the range of current cost estimates cited in Bangladesh at US$4–8 billion (although these figures need to be verified by feasibility studies).[6] Within that range, the risk of external debt distress remains low.

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[4] Under the ECF arrangement, the performance criterion (ceiling) on new nonconcessional external debt is assumed to rise over time to accommodate the new borrowing.

[5] The baseline scenario already reflects recapitalization costs of Tk 55 billion in FY13 to cover Bangladesh Petroleum Corporation-related losses for SOCBs, as well as a further partial SOCB recapitalization of Tk 20 billion in FY14. In addition, Fund staff estimates that the fiscal costs of restoring SOCB capital to the regulatory minimum in case of full write-off of non-performing loans would amount to about 1½ percentage points of GDP. The estimated costs, however, could go up following findings from the ongoing diagnostic examinations of SOCBs by Bangladesh Bank.

[6] Feasibility studies would need to ascertain the costs of risk mitigation associated with the health, safety, and environmental hazards posed by nuclear power in a high population country like Bangladesh. For more details, see the previous DSA.
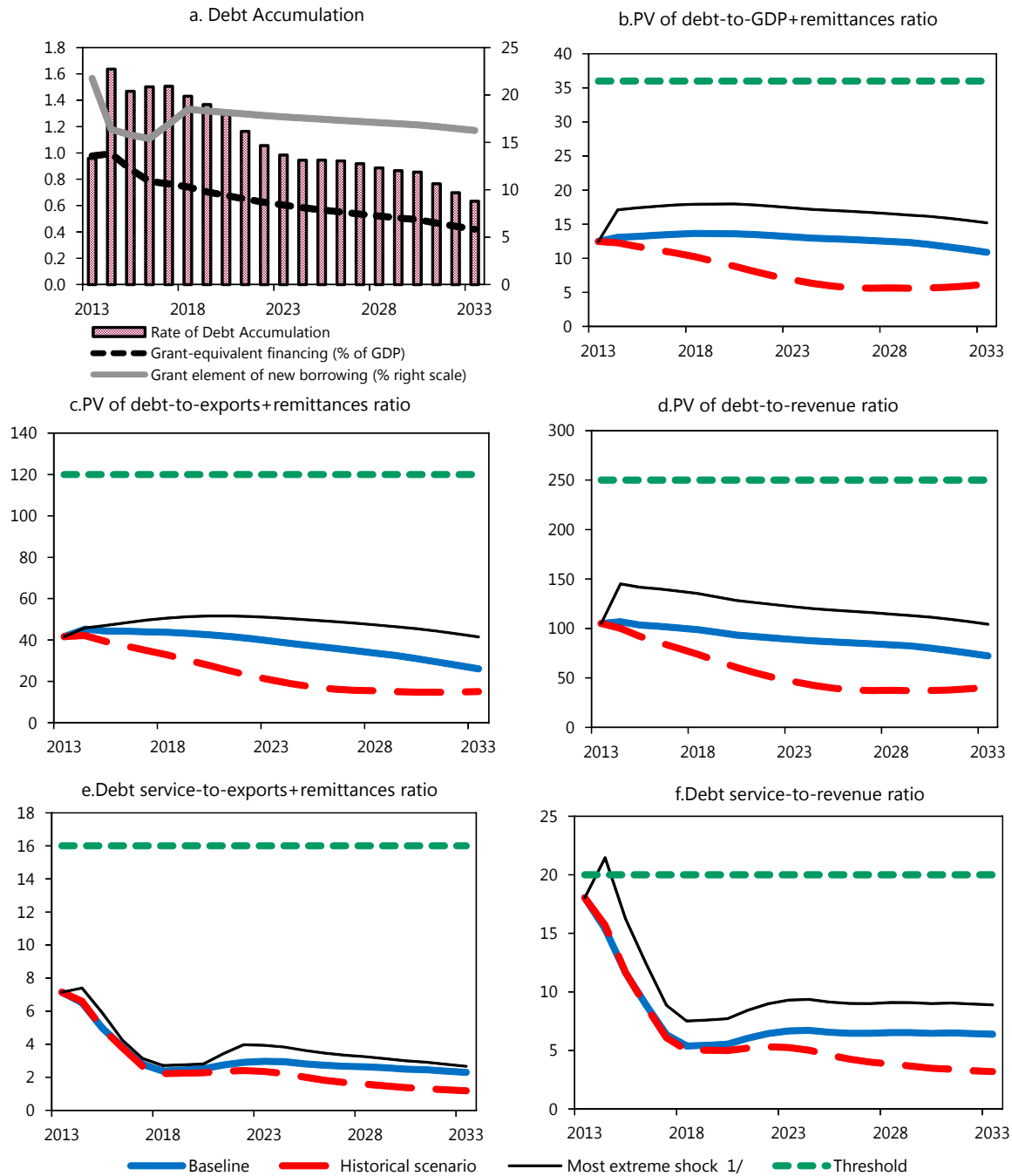
Table 1. Bangladesh: DSA Update: Key Variables 1/

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2023	2028	2033
	(Percent of GDP, unless otherwise indicated)											
Nominal GDP (US$ billions)	100	112	116	130	145	157	171	186	202	308	451	658
Real GDP (percentage change)	6.1	6.7	6.3	5.4	5.5	6.5	6.7	7.0	7.0	6.6	6.0	6.0
GDP deflator (percentage change)	6.5	7.5	8.0	7.7	6.8	5.4	5.7	5.6	5.6	4.5	4.5	4.5
Fiscal (central government)												
Total revenue and grants	11.5	11.9	13.0	13.7	14.1	14.7	15.0	15.4	15.7	16.6	16.6	16.6
Foreign grants	0.6	0.3	0.5	0.5	0.5	0.5	0.4	0.4	0.3	0.3	0.2	0.2
Total expenditure	14.6	16.0	16.4	17.8	17.9	18.0	18.1	18.3	18.5	18.7	18.5	18.3
Interest payments	2.1	2.0	2.2	2.2	2.2	2.1	1.9	1.9	1.9	1.7	1.6	1.6
Overall balance	-3.1	-4.1	-3.4	-4.0	-3.7	-3.3	-3.1	-2.9	-2.8	-2.1	-1.9	-1.7
Primary balance	-0.9	-2.2	-1.2	-1.8	-1.5	-1.2	-1.2	-1.0	-0.9	-0.4	-0.3	-0.1
Net domestic financing	1.3	3.8	2.4	3.0	2.5	2.2	1.8	1.7	1.8	1.6	1.5	1.6
Net external financing	0.9	0.4	0.8	1.0	1.3	1.1	1.3	1.2	1.0	0.5	0.4	0.1
Balance of payments												
Exports of goods and services	18.6	22.5	23.1	22.0	21.1	21.9	22.4	22.9	23.4	26.2	30.8	36.4
Imports of goods and services	25.5	34.3	34.1	31.3	31.6	32.5	33.1	33.7	34.2	36.6	40.8	45.3
Workers' remittances	10.9	10.4	11.1	11.3	11.0	11.2	11.3	11.4	11.4	10.5	9.7	9.0
Current account, including official transfers	3.2	-2.0	-0.5	1.2	-0.4	-0.4	-0.4	-0.4	-0.5	-1.0	-1.5	-1.0
Foreign direct investment	0.9	0.7	1.0	1.0	0.9	0.9	0.9	1.0	1.0	1.5	2.5	2.5
External borrowing												
Central government	1.6	0.9	1.5	1.7	2.0	1.8	1.9	1.8	1.6	1.4	1.3	1.0
Public enterprises with guarantee	0.0	0.0	0.0	0.1	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Debt service by public enterprises	...	...	...	0.0	0.0	0.0	0.1	0.2	0.2	0.5	0.5	0.5
Gross official reserves	3.2	2.9	3.0	3.6	3.8	4.1	4.3	4.4	4.5	4.5	4.7	5.0
(Months of imports of goods and services)												

Sources: Data provided by Bangladesh authorities; and IMF staff estimates and projections.

1/ Data on a fiscal year basis, with 2010 corresponding to July 2009–June 2010.

Figure 1. Bangladesh: Indicators of Public and Publicly Guaranteed External Debt under Different Assumptions, 2013–33 1/

(In percent)

a. Debt Accumulation

b.PV of debt-to-GDP+remittances ratio

- Rate of Debt Accumulation
- Grant-equivalent financing (% of GDP)
- Grant element of new borrowing (% right scale)

c.PV of debt-to-exports+remittances ratio

d.PV of debt-to-revenue ratio

e.Debt service-to-exports+remittances ratio

f.Debt service-to-revenue ratio

Baseline   Historical scenario   Most extreme shock 1/   Threshold

Sources: Data provided by Bangladesh authorities; and IMF 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 One-time depreciation shock; in c. to a Terms shock; in d. to a One-time depreciation shock; in e. to a Non-debt flows shock and in figure f. to a One-time depreciation shock.

Figure 2. Bangladesh: Indicators of Public Debt under Different Assumptions, 2013–33 1/

(In percent)

- Baseline
- Fix Primary Balance
- Most extreme shock Non-debt flows
- Historical scenario

PV of Debt-to-GDP Ratio

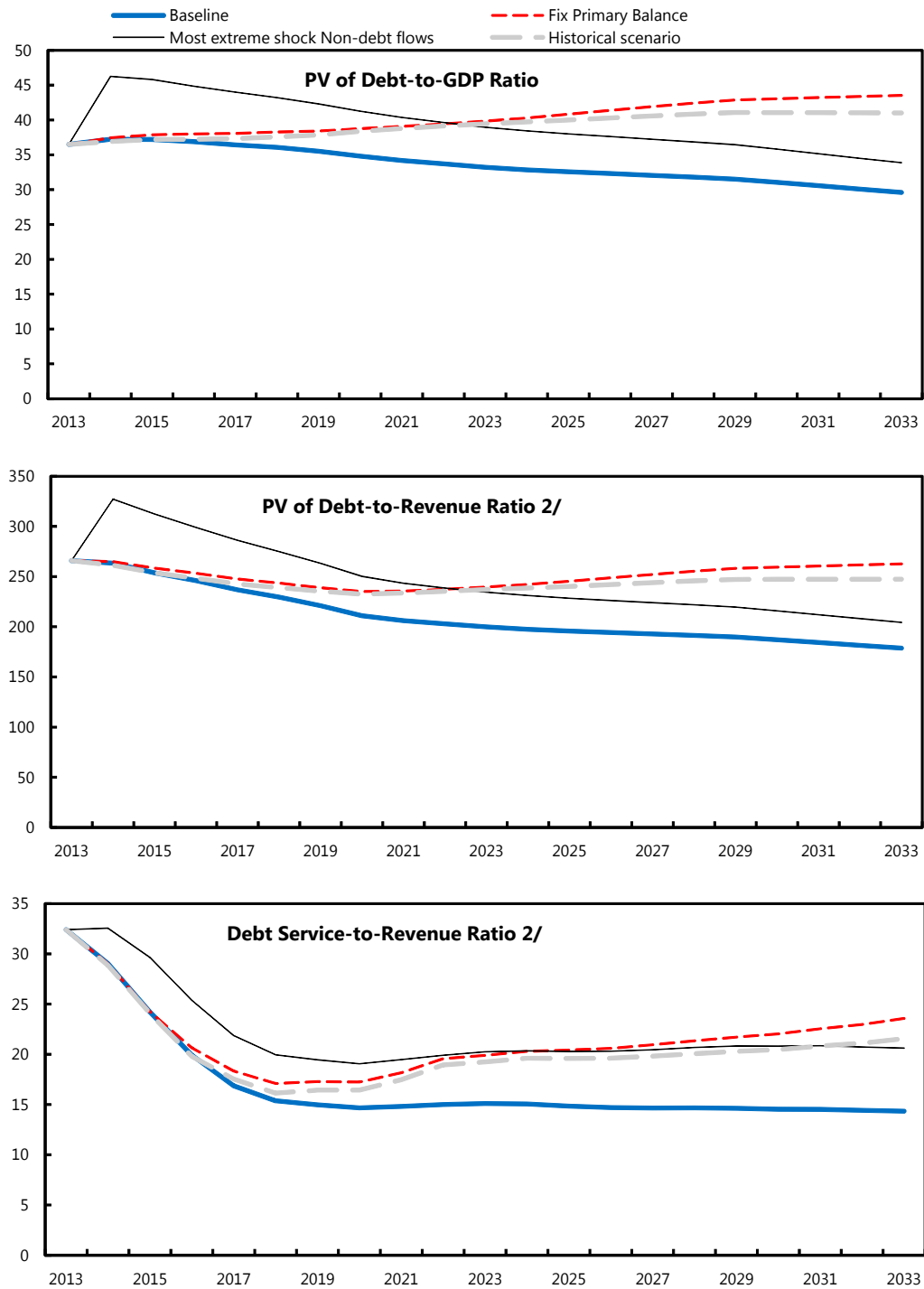**PV of Debt-to-Revenue Ratio 2/**

Debt Service-to-Revenue Ratio 2/

Sources: Data provided by Bangladesh authorities; and IMF 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.

Table 2. Bangladesh: External Debt Sustainability Framework, Baseline Scenario, 2010–33
(In percent of GDP, unless otherwise indicated)

	Actual			Historical 1/ Average	Standard 1/ Deviation	Projections						2013–2018 Average	2023	2033	2019–2033 Average
	2010	2011	2012			2013	2014	2015	2016	2017	2018				
External debt (nominal) 2/	**22.3**	**22.6**	**22.2**			**20.0**	**20.6**	**20.5**	**20.6**	**20.6**	**20.5**		**19.8**	**16.8**	
Of which: Public and publicly guaranteed (PPG)	21.0	21.3	20.7			18.6	19.3	19.3	19.4	19.5	19.5		18.3	14.7	
Change in external debt	-3.4	0.3	-0.5			-2.2	0.6	-0.1	0.1	0.0	0.0		-0.2	-0.5	
Identified net debt-creating flows	-7.0	-1.0	-1.3			-3.2	-1.5	-1.8	-1.8	-1.8	-1.8		-1.7	-2.4	
Non-interest current account deficit	**-3.5**	**1.8**	**0.2**	**-0.8**	**1.5**	**-1.6**	**0.0**	**0.0**	**0.1**	**0.1**	**0.2**		**0.6**	**0.6**	0.8
Deficit in balance of goods and services	6.8	11.8	11.0			9.3	10.5	10.6	10.7	10.8	10.8		10.3	8.8	
Exports	18.6	22.5	23.1			22.0	21.1	21.9	22.4	22.9	23.4		26.2	36.4	
Imports	25.5	34.3	34.1			31.3	31.6	32.5	33.1	33.7	34.2		36.6	45.3	
Net current transfers (negative = inflow)	-11.6	-11.1	-11.8	-9.5	2.1	-11.7	-11.4	-11.5	-11.6	-11.7	-11.7		-10.8	-9.2	-10.3
Of which: Official	-0.1	-0.1	-0.1			-0.1	-0.1	-0.1	-0.1	-0.1	-0.1		-0.1	-0.1	
Other current account flows (negative = net inflow)	1.2	1.1	1.0			0.8	0.9	0.9	1.0	1.0	1.1		1.1	1.0	
Net FDI (negative = inflow)	**-0.9**	**-0.7**	**-1.0**	**-0.9**	**0.2**	**-1.0**	**-0.9**	**-0.9**	**-0.9**	**-1.0**	**-1.0**		**-1.5**	**-2.5**	-1.9
Endogenous debt dynamics 3/	**-2.6**	**-2.1**	**-0.4**			**-0.6**	**-0.6**	**-0.9**	**-0.9**	**-1.0**	**-1.0**		**-0.8**	**-0.6**	
Contribution from nominal interest rate	0.2	0.2	0.3			0.4	0.4	0.4	0.4	0.4	0.4		0.4	0.4	
Contribution from real GDP growth	-1.4	-1.3	-1.4			-1.1	-1.0	-1.2	-1.3	-1.3	-1.3		-1.2	-1.0	
Contribution from price and exchange rate changes	-1.4	-1.0	0.7			...	...	...	...	...	...		...	...	
Residual (3-4) 4/	**3.6**	**1.3**	**0.8**			**1.0**	**2.1**	**1.7**	**1.8**	**1.9**	**1.7**		**1.5**	**1.9**	
Of which: Exceptional financing	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
PV of external debt 5/	...	...	16.9			15.2	15.8	15.9	16.1	16.2	16.3		16.0	14.0	
In percent of exports	...	...	73.2			69.2	74.8	72.5	71.7	70.8	69.6		61.0	38.3	
PV of PPG external debt	**...**	**...**	**15.4**			**13.9**	**14.5**	**14.7**	**14.9**	**15.1**	**15.2**		**14.5**	**11.9**	
In percent of exports	**...**	**...**	**66.9**			**63.1**	**68.9**	**67.1**	**66.6**	**65.9**	**65.0**		**55.3**	**32.6**	
In percent of government revenues	**...**	**...**	**124.0**			**105.0**	**106.8**	**103.4**	**102.2**	**100.6**	**98.8**		**88.7**	**72.3**	
Debt service-to-exports ratio (in percent)	**5.5**	**4.1**	**5.7**			**12.4**	**11.5**	**9.0**	**7.1**	**5.4**	**4.7**		**5.5**	**4.3**	
PPG debt service-to-exports ratio (in percent)	**5.2**	**3.8**	**4.8**			**10.8**	**9.9**	**7.5**	**5.8**	**4.2**	**3.5**		**4.2**	**2.9**	
PPG debt service-to-revenue ratio (in percent)	**8.8**	**7.4**	**8.8**			**18.0**	**15.4**	**11.6**	**8.9**	**6.4**	**5.4**		**6.7**	**6.4**	
Total gross financing need (Billions of U.S. dollars)	-3.3	2.4	1.2			1.9	3.7	2.8	2.0	1.1	0.7		1.9	-1.7	
Non-interest current account deficit that stabilizes debt ratio	-0.1	1.5	0.7			0.6	-0.6	0.1	0.0	0.1	0.2		0.9	1.2	
Key macroeconomic assumptions															
Real GDP growth (in percent)	6.1	6.7	6.3	6.2	0.4	5.4	5.5	6.5	6.7	7.0	7.0	6.3	6.6	6.0	6.4
GDP deflator in US dollar terms (change in percent)	5.9	4.5	-2.8	3.0	4.1	6.5	5.8	1.8	1.8	1.8	1.8	3.3	1.7	1.7	1.7
Effective interest rate (percent) 6/	1.1	0.9	1.5	1.1	0.2	2.1	2.1	2.0	1.9	1.9	1.9	2.0	2.1	2.5	2.2
Growth of exports of G&S (U.S. dollar terms, in percent)	7.5	34.5	6.0	14.9	8.5	7.1	6.9	12.4	11.2	11.4	11.3	10.0	11.4	11.5	11.4
Growth of imports of G&S (U.S. dollar terms, in percent)	5.7	50.0	2.7	16.5	14.0	2.9	12.6	11.4	10.8	10.8	10.6	9.9	9.9	10.1	10.2
Grant element of new public sector borrowing (in percent) 7/	...	...	...	...	...	21.7	16.4	15.8	15.4	16.9	18.5	17.4	17.7	16.3	17.3
Government revenues (excluding grants, in percent of GDP)	10.9	11.7	12.4			13.2	13.6	14.2	14.6	15.0	15.4		16.4	16.4	16.3
Aid flows (in Billions of U.S. dollars) 8/	2.2	1.3	2.3			1.3	1.5	1.4	1.4	1.5	1.6		1.9	2.9	
Of which: Grants	0.6	0.3	0.6			0.7	0.8	0.7	0.7	0.7	0.7		0.8	1.1	
Of which: Concessional loans	1.6	1.1	1.7			0.6	0.7	0.7	0.7	0.8	0.9		1.1	1.8	
Grant-equivalent financing (in percent of GDP) 8/	...	...	...			1.0	1.0	0.9	0.8	0.8	0.7		0.6	0.4	0.6
Grant-equivalent financing (in percent of external financing) 9/	...	...	...			36.7	29.3	29.1	27.6	28.5	30.0		27.5	24.7	26.5
Memorandum items:															
Nominal GDP (Billions of U.S. dollars)	100.4	111.9	115.6			129.7	144.8	157.0	170.5	185.8	202.4		308.4	657.7	
Nominal dollar GDP growth	12.3	11.5	3.3			12.2	11.6	8.4	8.7	8.9	9.0	9.8	8.4	7.8	8.2
PV of PPG external debt (in Billions of U.S. dollars)			17.2			18.4	20.5	22.6	25.0	27.5	30.2		44.2	80.8	
(PVt-PVt-1)/GDPt-1 (in percent)						1.0	1.6	1.5	1.5	1.4	1.4	1.4	1.0	0.6	1.0
Gross workers' remittances (Billions of U.S. dollars)	11.0	11.7	12.8			14.7	16.0	17.6	19.3	21.3	23.1		32.5	59.5	
PV of PPG external debt (in percent of GDP + remittances)	...	...	13.9			12.5	13.1	13.2	13.4	13.5	13.6		13.1	10.9	
PV of PPG external debt (in percent of exports + remittances)	...	...	45.1			41.6	45.3	44.4	44.2	44.0	43.7		39.5	26.1	
Debt service of PPG external debt (in percent of exports + remittances)	...	...	3.2			7.2	6.5	5.0	3.9	2.8	2.4		3.0	2.3	

Sources: Data provided by Bangladesh authorities; and IMF staff estimates and projections.

1/ Historical averages and standard deviations are generally derived over the past 10 years, subject to data availability.
2/ Central government gross debt, including debt owed to the IMF, plus external borrowing by public enterprises that is supported by central government guarantees, including short-term oil-related suppliers' credits.
The years in the table refers to fiscal years. For example, 2012 refers to July 2011-June 2012.
3/ 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.
4/ Includes exceptional financing (i.e., changes in arrears and debt relief); changes in gross foreign assets; and valuation adjustments. For projections also includes contribution from price and exchange rate changes.
5/ Assumes that PV of private sector debt is equivalent to its face value.
6/ Current-year interest payments divided by previous period debt stock.
7/ Reduced grant element in 2014 as a result of the issuance of a sovereign bond.
8/ Defined as grants, concessional loans, and debt relief.
9/ Grant-equivalent financing includes grants provided directly to the government and through new borrowing (difference between the face value and the PV of new debt).

Table 3. Bangladesh: Sensitivity Analysis for Key Indicators of Public and Publicly Guaranteed External Debt, 2013–33

(In percent)

				Projections				
	2013	2014	2015	2016	2017	2018	**2023**	2033
PV of debt-to-GDP+remittances ratio								
Baseline	12	13	13	13	14	14	**13**	11
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2013-2033 1/	12	12	12	11	11	10	**7**	6
A2. New public sector loans on less favorable terms in 2013-2033 2	12	13	14	15	15	16	**17**	17
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2014-2015	12	13	13	13	13	13	**13**	11
B2. Export value growth at historical average minus one standard deviation in 2014-2015 3/	12	13	14	14	14	14	**13**	11
B3. US dollar GDP deflator at historical average minus one standard deviation in 2014-2015	12	14	14	14	14	15	**14**	12
B4. Net non-debt creating flows at historical average minus one standard deviation in 2014-2015 4/	12	17	20	19	19	19	**16**	12
B5. Combination of B1-B4 using one-half standard deviation shocks	12	16	19	18	18	18	**16**	12
B6. One-time 30 percent nominal depreciation relative to the baseline in 2014 5/	12	17	17	18	18	18	**17**	15
PV of debt-to-exports+remittances ratio								
Baseline	42	45	44	44	44	44	**39**	26
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2013-2033 1/	42	42	39	37	35	33	**21**	15
A2. New public sector loans on less favorable terms in 2013-2033 2	42	46	47	48	50	51	**51**	42
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2014-2015	42	44	44	43	43	43	**39**	27
B2. Export value growth at historical average minus one standard deviation in 2014-2015 3/	42	44	49	48	48	47	**42**	29
B3. US dollar GDP deflator at historical average minus one standard deviation in 2014-2015	42	44	44	43	43	43	**39**	27
B4. Net non-debt creating flows at historical average minus one standard deviation in 2014-2015 4/	42	63	74	63	62	60	**49**	28
B5. Combination of B1-B4 using one-half standard deviation shocks	42	55	63	55	54	53	**45**	27
B6. One-time 30 percent nominal depreciation relative to the baseline in 2014 5/	42	44	44	43	43	43	**39**	27
PV of debt-to-revenue ratio								
Baseline	105	107	103	102	101	99	**89**	72
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2013-2033 1/	105	100	92	86	80	74	**46**	41
A2. New public sector loans on less favorable terms in 2013-2033 2	105	108	110	112	114	115	**114**	115
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2014-2015	105	104	102	101	99	97	**88**	75
B2. Export value growth at historical average minus one standard deviation in 2014-2015 3/	105	105	110	108	106	103	**91**	75
B3. US dollar GDP deflator at historical average minus one standard deviation in 2014-2015	105	111	112	110	109	107	**96**	82
B4. Net non-debt creating flows at historical average minus one standard deviation in 2014-2015 4/	105	130	152	146	141	136	**110**	79
B5. Combination of B1-B4 using one-half standard deviation shocks	105	126	144	139	135	131	**109**	82
B6. One-time 30 percent nominal depreciation relative to the baseline in 2014 5/	105	145	142	140	138	135	**122**	104

Table 3. Bangladesh: Sensitivity Analysis for Key Indicators of Public and Publicly Guaranteed External Debt, 2013-2033

Publicly Guaranteed External Debt, 2013–33 (concluded)

(In percent)

				Projections				
	2013	2014	2015	2016	2017	2018	**2023**	2033
Debt service-to-exports+remittances ratio								
Baseline	7	7	5	4	3	2	**3**	2
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2013-2033 1/	7	7	5	4	3	2	**2**	1
A2. New public sector loans on less favorable terms in 2013-2033 2	7	7	5	4	3	2	**3**	3
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2014-2015	7	7	5	4	3	2	**3**	2
B2. Export value growth at historical average minus one standard deviation in 2014-2015 3/	7	7	5	4	3	3	**3**	2
B3. US dollar GDP deflator at historical average minus one standard deviation in 2014-2015	7	7	5	4	3	2	**3**	2
B4. Net non-debt creating flows at historical average minus one standard deviation in 2014-2015 4/	7	7	6	4	3	3	**4**	3
B5. Combination of B1-B4 using one-half standard deviation shocks	7	7	6	4	3	3	**4**	2
B6. One-time 30 percent nominal depreciation relative to the baseline in 2014 5/	7	7	5	4	3	2	**3**	2
Debt service-to-revenue ratio								
Baseline	18	15	12	9	6	5	**7**	6
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2013-2033 1/	18	16	12	9	6	5	**5**	3
A2. New public sector loans on less favorable terms in 2013-2033 2	18	15	12	9	7	6	**7**	9
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2014-2015	18	15	12	9	6	5	**7**	6
B2. Export value growth at historical average minus one standard deviation in 2014-2015 3/	18	15	12	9	6	6	**7**	7
B3. US dollar GDP deflator at historical average minus one standard deviation in 2014-2015	18	16	13	10	7	6	**7**	7
B4. Net non-debt creating flows at historical average minus one standard deviation in 2014-2015 4/	18	15	12	10	7	6	**9**	7
B5. Combination of B1-B4 using one-half standard deviation shocks	18	16	13	10	7	6	**9**	7
B6. One-time 30 percent nominal depreciation relative to the baseline in 2014 5/	18	21	16	12	9	8	**9**	9
Memorandum item:								
Grant element assumed on residual financing (i.e., financing required above baseline) 6/	14	14	14	14	14	14	**14**	14

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 4. Bangladesh: Public Sector Debt Sustainability Framework, Baseline Scenario, 2010–33
(In percent of GDP, unless otherwise indicated)

	Actual		Estimate	Average 1/	Standard Deviation 1/	Projections						2013–18 Average	2023	2033	2019–33 Average
	2010	2011	2012			2013	2014	2015	2016	2017	2018				
Public sector debt 2/	42.9	44.2	42.8			41.2	42.0	41.8	41.4	40.8	40.3		37.0	32.5	
Of which: domestic borrowing by nonfinancial public enterprises	1.6	1.8	1.4			1.4	1.4	1.4	1.4	1.4	1.4		1.4	1.4	
Of which: foreign-currency denominated	21.0	21.3	20.7			18.6	19.3	19.3	19.4	19.5	19.5		18.3	14.7	
Of which: guarantee-supported external borrowing	...	...	...			0.1	0.6	1.1	1.7	2.1	2.5		3.9	5.9	
Change in public sector debt	-2.5	1.3	-1.4			-1.5	0.8	-0.2	-0.5	-0.6	-0.5		-0.6	-0.6	
Identified debt-creating flows	-2.0	-0.1	-0.3			-1.7	0.6	-0.3	-0.4	-0.7	-0.7		-0.8	-0.8	
Primary deficit	0.9	2.2	1.1	1.3	0.5	1.7	1.4	1.1	1.2	1.0	1.0	1.2	0.4	0.1	0.3
Revenue and grants	11.5	11.9	13.0			13.7	14.1	14.7	15.0	15.4	15.7		16.6	16.6	
Of which: Grants	0.6	0.3	0.5			0.5	0.5	0.5	0.4	0.4	0.3		0.3	0.2	
Primary (noninterest) expenditure	12.4	14.1	14.1			15.4	15.6	15.8	16.2	16.4	16.7		17.0	16.7	
Automatic debt dynamics	-2.9	-2.3	-1.5			-3.4	-1.4	-2.0	-2.1	-2.2	-2.2		-1.7	-1.5	
Contribution from interest rate/growth differential	-1.8	-2.6	-2.3			-1.6	-1.5	-1.8	-2.1	-2.2	-2.2		-1.7	-1.3	
of which: Contribution from average real interest rate	0.8	0.1	0.3			0.6	0.7	0.8	0.5	0.5	0.4		0.6	0.6	
of which: Contribution from real GDP growth	-2.6	-2.7	-2.6			-2.2	-2.2	-2.6	-2.6	-2.7	-2.7		-2.3	-1.9	
Contribution from real exchange rate depreciation	-1.1	0.2	0.8			-1.9	0.1	-0.2	0.0	0.0	0.0		...	...	
Other identified debt-creating flows	0.0	0.0	0.0			0.1	0.5	0.6	0.6	0.6	0.6		0.5	0.5	
Guarantee-supported external borrowing	0.0	0.0	0.0			0.1	0.5	0.6	0.6	0.6	0.6		0.5	0.5	
Residual, including asset changes	-0.5	1.4	-1.1			0.1	0.2	0.1	0.0	0.1	0.2		0.2	0.2	
Other Sustainability Indicators															
PV of public sector debt	...	...	37.5			36.5	37.2	37.2	36.9	36.4	36.1		33.2	29.6	
Of which: Foreign-currency denominated	...	...	15.4			13.9	14.5	14.7	14.9	15.1	15.2		14.5	11.9	
Of which: External	...	...	15.4			13.9	14.5	14.7	14.9	15.1	15.2		14.5	11.9	
PV of contingent liabilities (not included in public sector debt)	...	...	...			...	...	...	...	...	...		...	...	
Gross financing need 3/	3.9	6.3	6.5			8.6	7.7	6.6	5.8	5.0	4.6		4.1	3.7	
PV of public sector debt-to-revenue and grants ratio (in percent)	...	...	289.3			265.9	263.4	253.8	245.9	236.8	229.5		199.9	178.6	
PV of public sector debt-to-revenue ratio (in percent)	...	...	301.7			276.1	273.6	262.3	252.8	242.8	234.7		203.0	180.5	
Of which: External 4/	...	...	124.0			105.0	106.8	103.4	102.2	100.6	98.8		88.7	72.3	
Debt service-to-revenue and grants ratio (in percent) 5/	25.2	22.1	24.3			32.4	29.0	24.2	19.9	16.9	15.4		15.1	14.3	
Debt service-to-revenue ratio (in percent) 5/	26.6	22.6	25.3			33.7	30.2	25.0	20.5	17.3	15.7		15.3	14.5	
Primary deficit that stabilizes the debt-to-GDP ratio	3.4	0.9	2.6			3.2	0.7	1.3	1.6	1.6	1.4		0.9	0.7	
Key macroeconomic and fiscal assumptions															
Real GDP growth (in percent)	6.1	6.7	6.3	6.2	0.4	5.4	5.5	6.5	6.7	7.0	7.0	6.3	6.6	6.0	6.4
Average nominal interest rate on forex debt (in percent)	1.1	0.9	1.2	1.0	0.1	1.7	1.7	1.6	1.5	1.5	1.5	1.6	1.6	1.6	1.6
Average real interest rate on domestic debt (in percent)	3.6	1.7	2.1	3.3	1.2	2.7	3.0	3.8	2.6	2.6	2.7	2.9	3.7	3.6	3.6
Real exchange rate depreciation (in percent, + indicates depreciation)	-4.9	1.2	4.2	-0.3	4.7	-9.5	...	...	...	...	...		...	...	
Inflation rate (GDP deflator, in percent)	6.5	7.5	8.0	6.3	1.5	7.7	6.8	5.4	5.7	5.6	5.6	6.1	4.5	4.5	4.6
Growth of real primary spending (deflated by GDP deflator, in percent)	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Grant element of new external borrowing (in percent) 6/	...	...	... ...		...	21.7	16.4	15.8	15.4	16.9	18.5	17.4	17.7	16.3	17.3

Sources: Data provided by Bangladesh authorities; and IMF staff estimates and projections.

1/ Historical averages and standard deviations are generally derived over the past 10 years, subject to data availability.
2/ Central government gross debt, including debt owed to the IMF, plus domestic bank borrowing by the nonfinancial public sector and external borrowing by public enterprises that is supported
by central government guarantees, including short-term oil-related suppliers' credits. The years in the table refers to fiscal years. For example, 2012 refers to July 2011–June 2012.
3/ 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.
4/ Revenues excluding grants.
5/ Debt service is defined as the sum of interest and amortization of medium and long-term debt.
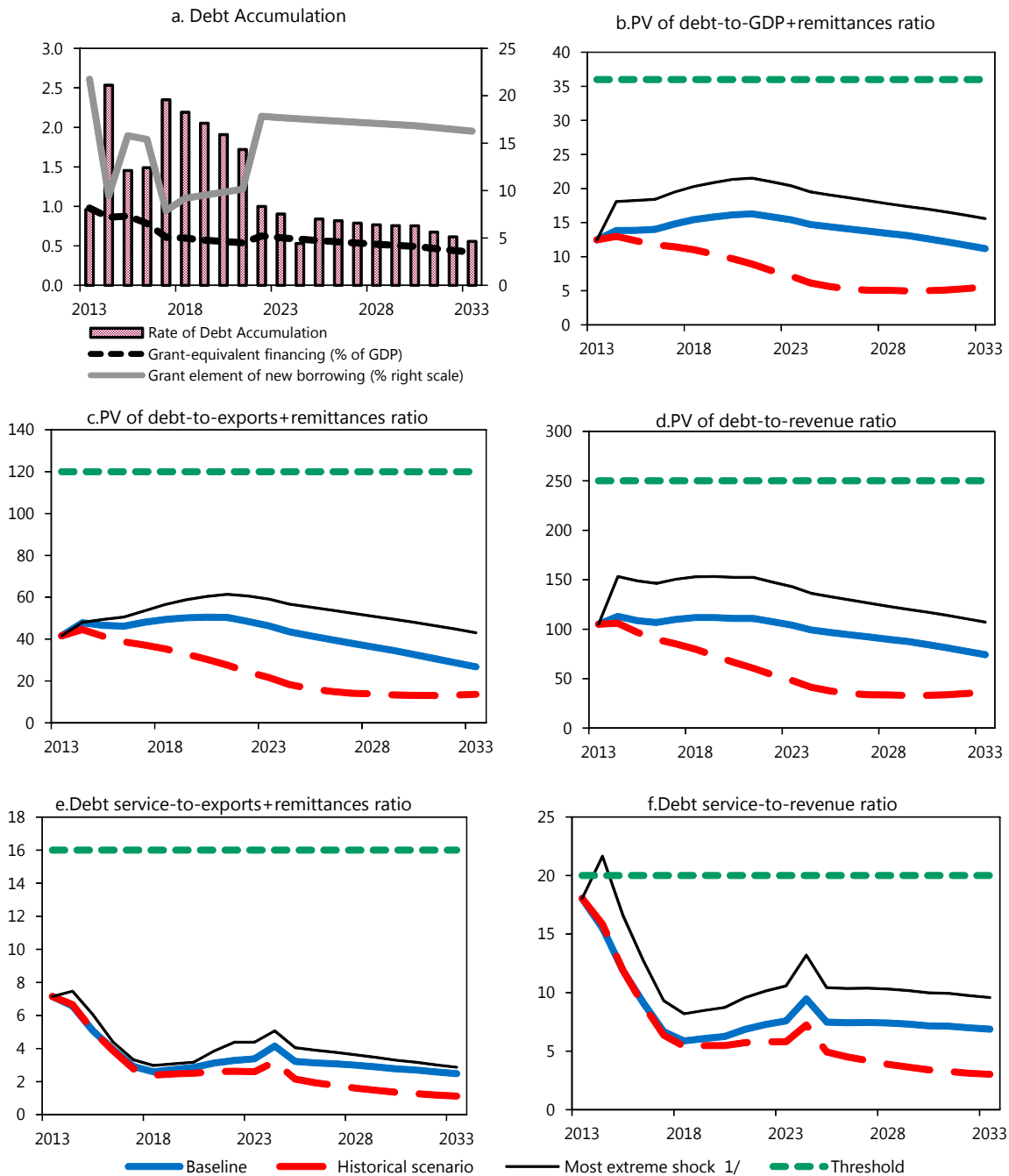6/ Reduced grant element in 2014 as a result of the issuance of a sovereign bond.

Table 5. Bangladesh: Sensitivity Analysis for Key Indicators of Public Debt 2013–33

(In percent)

				Projections				
	2013	2014	2015	2016	2017	2018	**2023**	2033
PV of Debt-to-GDP Ratio								
Baseline	37	37	37	37	36	36	**33**	30
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	37	37	37	37	37	38	**39**	41
A2. Primary balance is unchanged from 2013	37	37	38	38	38	38	**40**	44
A3. Permanently lower GDP growth 1/	37	37	37	37	37	36	**34**	32
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2014–2015	37	37	37	37	37	36	**34**	31
B2. Primary balance is at historical average minus one standard deviations in 2014–2015	37	38	38	38	37	37	**34**	30
B3. Combination of B1-B2 using one half standard deviation shocks	37	37	38	37	37	37	**34**	30
B4. One-time 30 percent real depreciation in 2014	37	43	43	42	41	41	**37**	33
B5. 10 percent of GDP increase in other debt-creating flows in 2014	37	46	46	45	44	43	**39**	34
PV of Debt-to-Revenue Ratio 2/								
Baseline	266	263	254	246	237	230	**200**	179
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	266	261	254	248	243	239	**237**	247
A2. Primary balance is unchanged from 2013	266	265	258	253	248	244	**240**	263
A3. Permanently lower GDP growth 1/	266	264	254	247	238	231	**205**	194
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2014–2015	266	263	255	248	239	232	**204**	185
B2. Primary balance is at historical average minus one standard deviations in 2014–2015	266	266	261	252	243	235	**204**	181
B3. Combination of B1-B2 using one half standard deviation shocks	266	263	258	250	240	233	**203**	181
B4. One-time 30 percent real depreciation in 2014	266	306	291	280	268	259	**223**	199
B5. 10 percent of GDP increase in other debt-creating flows in 2014	266	327	312	299	286	275	**234**	204
Debt Service-to-Revenue Ratio 2/								
Baseline	32	29	24	20	17	15	**15**	14
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	32	29	24	20	18	16	**19**	22
A2. Primary balance is unchanged from 2013	32	29	24	21	18	17	**20**	24
A3. Permanently lower GDP growth 1/	32	29	24	20	17	16	**16**	16
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2014–2015	32	29	24	20	17	16	**16**	15
B2. Primary balance is at historical average minus one standard deviations in 2014–2015	32	29	24	21	19	16	**15**	15
B3. Combination of B1-B2 using one half standard deviation shocks	32	29	24	21	18	16	**15**	15
B4. One-time 30 percent real depreciation in 2014	32	33	30	25	22	20	**20**	21
B5. 10 percent of GDP increase in other debt-creating flows in 2014	32	29	28	45	21	26	**19**	22

Sources: Data provided by Bangladesh authorities; and IMF staff estimates and projections.

1/ Assumes that real GDP growth is at baseline minus one standard deviation divided by the square root of the length of the projection period.

2/ Revenues are defined inclusive of grants.

Figure 3. Bangladesh: Alternative Scenario—Indicators of Public and Publicly Guaranteed External Debt under Different Assumptions, 2013–33 1/

(In percent)

a. Debt Accumulation

b.PV of debt-to-GDP+remittances ratio

- Rate of Debt Accumulation
- Grant-equivalent financing (% of GDP)
- Grant element of new borrowing (% right scale)

c.PV of debt-to-exports+remittances ratio

d.PV of debt-to-revenue ratio

e.Debt service-to-exports+remittances ratio

f.Debt service-to-revenue ratio

Baseline — Historical scenario — Most extreme shock 1/ — Threshold

Sources: Data provided by Bangladesh authorities; and IMF 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 One-time depreciation shock; in c. to a Terms shock; in d. to a One-time depreciation shock; in e. to a Non-debt flows shock and in figure f. to a One-time depreciation shock.

Table 6. Bangladesh: External Debt Sustainability Framework, Alternative Scenario, 2010–33
(In percent of GDP, unless otherwise indicated)

	Actual			Historical [1/] Average	Standard [1/] Deviation	Projections						2013–2018 Average	2023	2033	2019–2033 Average
	2010	2011	2012			2013	2014	2015	2016	2017	2018				
External debt (nominal) 2/	**22.3**	**22.6**	**22.2**			**20.0**	**21.3**	**21.1**	**21.2**	**21.8**	**22.2**		**22.0**	**17.2**	
Of which: Public and publicly guaranteed (PPG)	21.0	21.3	20.7			18.6	20.0	19.9	20.0	20.7	21.2		20.5	15.1	
Change in external debt	-3.4	0.3	-0.5			-2.2	1.3	-0.1	0.0	0.6	0.5		-0.5	-0.6	
Identified net debt-creating flows	-7.0	-1.0	-1.3			-3.2	-1.5	-1.8	-1.8	-1.3	-1.2		-1.7	-2.4	
Non-interest current account deficit	**-3.5**	**1.8**	**0.2**	**-0.8**	**1.5**	**-1.6**	**0.0**	**0.0**	**0.1**	**0.6**	**0.7**		**0.7**	**0.6**	0.9
Deficit in balance of goods and services	6.8	11.8	11.0			9.3	10.5	10.6	10.7	11.3	11.3		10.3	8.8	
Exports	18.6	22.5	23.1			22.0	21.1	21.9	22.4	22.9	23.4		26.2	36.4	
Imports	25.5	34.3	34.1			31.3	31.6	32.5	33.1	34.2	34.7		36.5	45.2	
Net current transfers (negative = inflow)	-11.6	-11.1	-11.8	-9.5	2.1	-11.7	-11.4	-11.5	-11.6	-11.7	-11.7		-10.8	-9.2	-10.3
Of which: Official	-0.1	-0.1	-0.1			-0.1	-0.1	-0.1	-0.1	-0.1	-0.1		-0.1	-0.1	
Other current account flows (negative = net inflow)	1.2	1.1	1.0			0.8	0.8	0.9	1.0	1.0	1.1		1.2	1.1	
Net FDI (negative = inflow)	**-0.9**	**-0.7**	**-1.0**	**-0.9**	**0.2**	**-1.0**	**-0.9**	**-0.9**	**-0.9**	**-1.0**	**-1.0**		**-1.5**	**-2.5**	-1.9
Endogenous debt dynamics 3/	**-2.6**	**-2.1**	**-0.4**			**-0.6**	**-0.6**	**-0.9**	**-0.9**	**-0.9**	**-1.0**		**-0.9**	**-0.6**	
Contribution from nominal interest rate	0.2	0.2	0.3			0.4	0.4	0.4	0.4	0.4	0.4		0.5	0.4	
Contribution from real GDP growth	-1.4	-1.3	-1.4			-1.1	-1.0	-1.3	-1.3	-1.4	-1.4		-1.4	-1.0	
Contribution from price and exchange rate changes	-1.4	-1.0	0.7			...	...	...	...	...	...		...	...	
Residual (3-4) 4/	3.6	1.3	0.8			1.0	2.8	1.6	1.8	1.9	1.7		1.2	1.8	
Of which: Exceptional financing	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
PV of external debt 5/	...	...	16.9			15.2	16.6	16.6	16.7	17.6	18.3		18.5	14.3	
In percent of exports	...	...	73.2			69.2	78.8	75.9	74.7	76.9	78.2		70.6	39.2	
PV of PPG external debt	**...**	**...**	**15.4**			**13.9**	**15.4**	**15.4**	**15.6**	**16.5**	**17.2**		**17.0**	**12.2**	
In percent of exports	...	...	66.9			63.1	72.8	70.5	69.6	72.1	73.6		65.0	33.5	
In percent of government revenues	...	...	124.0			105.0	112.8	108.7	106.8	109.9	111.8		104.2	74.3	
Debt service-to-exports ratio (in percent)	**5.5**	**4.1**	**5.7**			**12.4**	**11.6**	**9.1**	**7.3**	**5.6**	**5.0**		**6.1**	**4.5**	
PPG debt service-to-exports ratio (in percent)	**5.2**	**3.8**	**4.8**			**10.8**	**10.0**	**7.7**	**5.9**	**4.4**	**3.9**		**4.7**	**3.1**	
PPG debt service-to-revenue ratio (in percent)	**8.8**	**7.4**	**8.8**			**18.0**	**15.5**	**11.9**	**9.1**	**6.7**	**5.9**		**7.6**	**6.9**	
Total gross financing need (Billions of U.S. dollars)	-3.3	2.4	1.2			1.9	3.7	2.8	2.1	2.2	1.9		2.5	-1.1	
Non-interest current account deficit that stabilizes debt ratio	-0.1	1.5	0.7			0.6	-1.3	0.1	0.1	0.0	0.2		1.1	1.3	
Key macroeconomic assumptions															
Real GDP growth (in percent)	6.1	6.7	6.3	6.2	0.4	5.4	5.5	6.5	6.7	7.0	7.0	6.3	6.6	6.0	6.4
GDP deflator in US dollar terms (change in percent)	5.9	4.5	-2.8	3.0	4.1	6.5	5.8	1.8	1.8	1.8	1.8	3.3	1.7	1.7	1.7
Effective interest rate (percent) 6/	1.1	0.9	1.5	1.1	0.2	2.1	2.2	2.1	2.0	2.1	2.2	2.1	2.5	2.5	2.5
Growth of exports of G&S (U.S. dollar terms, in percent)	7.5	34.5	6.0	14.9	8.5	7.1	6.9	12.4	11.2	11.4	11.3	10.0	11.4	11.5	11.4
Growth of imports of G&S (U.S. dollar terms, in percent)	5.7	50.0	2.7	16.5	14.0	2.9	12.6	11.4	10.8	12.6	10.4	10.1	9.9	10.1	10.1
Grant element of new public sector borrowing (in percent) 7/	...	...	...	...	...	21.7	9.5	15.8	15.4	7.9	9.2	13.2	17.7	16.3	15.7
Government revenues (excluding grants, in percent of GDP)	10.9	11.7	12.4			13.2	13.6	14.2	14.6	15.0	15.4		16.4	16.4	16.3
Aid flows (in Billions of U.S. dollars) 8/	2.2	1.3	2.3			1.3	1.5	1.4	1.4	1.5	1.6		1.9	2.9	
Of which: Grants	0.6	0.3	0.6			0.7	0.8	0.7	0.7	0.7	0.7		0.8	1.1	
Of which: Concessional loans	1.6	1.1	1.7			0.6	0.7	0.7	0.7	0.8	0.9		1.1	1.8	
Grant-equivalent financing (in percent of GDP) 8/	...	...	...			1.0	0.9	0.9	0.8	0.6	0.6		0.6	0.4	0.5
Grant-equivalent financing (in percent of external financing) 9/	...	...	...			36.7	21.1	29.1	27.6	18.3	19.5		27.4	24.7	24.7
Memorandum items:															
Nominal GDP (Billions of U.S. dollars)	100.4	111.9	115.6			129.7	144.8	157.0	170.5	185.8	202.5		308.6	658.2	
Nominal dollar GDP growth	12.3	11.5	3.3			12.2	11.6	8.4	8.7	8.9	9.0	9.8	8.4	7.8	8.2
PV of PPG external debt (in Billions of U.S. dollars)			17.2			18.4	21.6	23.8	26.1	30.1	34.2		51.9	83.0	
(PVt-PVt-1)/GDPt-1 (in percent)						1.0	2.5	1.5	1.5	2.3	2.2	1.8	0.9	0.6	1.0
Gross workers' remittances (Billions of U.S. dollars)	11.0	11.7	12.8			14.7	16.0	17.6	19.3	21.3	23.1		32.5	59.5	
PV of PPG external debt (in percent of GDP + remittances)	...	...	13.9			12.5	13.8	13.9	14.0	14.8	15.4		15.4	11.2	
PV of PPG external debt (in percent of exports + remittances)	...	...	45.1			41.6	47.8	46.6	46.2	48.1	49.4		46.4	26.8	
Debt service of PPG external debt (in percent of exports + remittances)	...	...	3.2			7.2	6.6	5.1	3.9	2.9	2.6		3.4	2.5	

Sources: Data provided by Bangladesh authorities; and IMF staff estimates and projections.

1/ Historical averages and standard deviations are generally derived over the past 10 years, subject to data availability.
2/ Central government gross debt, including debt owed to the IMF, plus external borrowing by public enterprises that is supported by central government guarantees, including short-term oil-related suppliers' credits. The years in the table refers to fiscal years. For example, 2012 refers to July 2011-June 2012.
3/ 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.
4/ Includes exceptional financing (i.e., changes in arrears and debt relief); changes in gross foreign assets; and valuation adjustments. For projections also includes contribution from price and exchange rate changes.
5/ Assumes that PV of private sector debt is equivalent to its face value.
6/ Current-year interest payments divided by previous period debt stock.
7/ Reduced grant element in 2014 as a result of the issuance of a sovereign bond.
8/ Defined as grants, concessional loans, and debt relief.
9/ Grant-equivalent financing includes grants provided directly to the government and through new borrowing (difference between the face value and the PV of new debt).