INTERNATIONAL MONETARY FUND

BANGLADESH

STAFF REPORT FOR THE 2015 ARTICLE IV CONSULTATION—DEBT SUSTAINABILITY ANALYSIS UPDATE

January 5, 2016

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This debt sustainability analysis (DSA) updates the joint IMF/IDA full DSA from October 5, 2015.[1] *The results indicate that Bangladesh remains at a low risk of external public debt distress. Total public debt is also on a sustainable path assuming that the new value added tax (VAT) comes into effect in full.*[2] *In the absence of a permanent boost to revenues, the public debt trajectory would become unsustainable.*

A. Background

This Debt Sustainability Analysis (DSA) update presents staffs' macroeconomic outlook and assumptions about the public sector's external and domestic borrowing paths. The DSA incorporates the authorities' estimates of the stock of public external and domestic debt and private external debt as of end-FY15 (fiscal year 2015, July 2014-June 2015) and analyzes the likely trajectories of standard debt sustainability (solvency and liquidity) ratios through FY36.

As of end-FY15, total public sector and public sector-guaranteed external nominal debt amounted to US$26 billion (13 percent of GDP or 77 percent of exports of goods and services). The World Bank and the Asian Development Bank are—by far—the two largest

[1] Based on the end-June 2014 stock of debt, the last full DSA was prepared in October 2015 (IMF Country Report No. 15/304). In line with the *Staff Guidance Note on the Application of the Joint Bank-Fund Debt Sustainability Framework for Low-Income Countries* (SM/13/292, IDA/SEC/82566), a full DSA is expected to be prepared once every three years for PRGT-eligible, IDA-only countries. In between short updates are expected to be produced unless macroeconomic conditions since the last full DSA have significantly changed.

[2] For the purposes of this DSA, the public sector comprises the central government and nonfinancial public enterprises. This analysis is based on the joint Fund-Bank debt sustainability framework for conducting debt sustainability analysis in low-income countries. Under IDA's Country Policy and Institutional Assessment (CPIA), Bangladesh is assessed to be a medium performer, with an average rating of 3.31 during 2012–14. This DSA update uses the indicative thresholds for countries for this category.

creditors, with outstanding loans of US$12 and US$7 billion, respectively. The largest bilateral creditor is Japan, with outstanding loans of US$2 billion (text table).

Bangladesh: Public and Publicly Guaranteed External Debt
(At end-June 2015)

	In millions of U.S. dollars	In percent of total external debt
Multilateral debt	20,507	78.5
World Bank	11,596	44.4
Asian Development Bank	7,402	28.3
International Monetary Fund	705	2.7
Islamic Development Bank	406	1.6
International Fund for Agricultural Development	339	1.3
Other	58	0.2
Bilateral debt	3,993	15.3
Japan	2,066	7.9
China	917	3.5
Korea, Republic of	353	1.3
India	207	0.8
Kuwait	121	0.5
Other	329	1.3
Guarantees provided to external borrowing by state-owned enterprises	941	3.6
Short-term debt	691	2.6
Total	26,131	100.0
(Percent of GDP)	13.4	

Sources: Bangladesh authorities; and IMF staff estimates.

Total public sector domestic debt as of end-FY15 amounted to 20 percent of GDP (or 208 percent of central government revenues, including grants). Domestic debt comprises mostly commercial banks' holdings of treasury instruments and non-banks' holdings of national savings certificates.[3] It also includes net credit by Bangladesh Bank and the outstanding liabilities of state-owned enterprises to the banking system (text table).

[3] High exposure of commercial banks to the central government remains a concern (see Box 1 in IMF Country Report No. 14/149 for a discussion). Development of an active secondary market and a funded pension system could help weaken the bank-sovereign link.

Bangladesh: Public Domestic Debt
(At end-June 2015)

	In billions of taka	In percent of total domestic debt
Central government	2,928	96.3
Overdraft at Bangladesh Bank (BB)	0	0.0
Ways and means advances from BB	24	0.8
Treasury bills	331	10.9
Treasury bonds	1,148	37.8
Checks issued but not cashed	113	3.7
Directorate of National Savings instruments	1,048	34.5
General Provident Fund	264	8.7
State-owned enterprises		
Net liabilities to the banking system	111	3.7
Total	3,039	100.0
(Percent of GDP)	20.1	

Sources: Bangladesh authorities; and IMF staff estimates.

B. Underlying Assumptions

The main changes to the macroeconomic assumptions relative to the full DSA in October 2015 are described below, primarily reflecting the impact of revisions to FY16 projections (based on data outturns for the first three months of FY16):

- Growth in FY16 and FY17 has been marked down by 0.2 percentage points of GDP.
- Average annual export and import growth in FY16-FY20 has been marked down by 0.7 and 0.3 percentage points respectively.
- The real bilateral taka-dollar exchange rate is assumed to appreciate by 3 percent in FY16 instead of remaining constant.

C. External DSA

Under the baseline scenario, Bangladesh's public and publicly guaranteed (PPG) external debt to GDP ratio is projected to increase from 13 percent of GDP in FY15 to 15 percent in FY21, mostly reflecting higher externally-financed public investment. It is projected to peak at approximately 17 percent in the late 2020s before trending down to 15 percent of GDP by FY36. All associated PPG indicators also trend up initially (reflecting the on-take of new debt at a declining grant element), but remain well within the respective policy-dependent solvency thresholds under the baseline scenario and all associated stress tests (Figure 1 and Tables 2–3). The stress tests with the larger impact on debt indicators are those involving a large nominal depreciation or borrowing on less favorable terms.

D. Public DSA

The present value (PV) of public debt to GDP ratio is projected to increase from 29½ per cent in FY15 to 34 per cent in FY21 as the impact of higher public investment on debt is mostly offset by an expected increase in tax revenue from the new VAT. The public debt-to-GDP ratio rises slightly further in the long term, reflecting a gradual increase in real interest rates as the concessionality of debt is assumed to decline steadily. By FY36 the debt-to-GDP ratio will be about 41 percent of GDP as compared with 35 percent of GDP in FY15. As in the case of the external DSA, all associated total PPG debt indicators remain well within the benchmark value under the baseline and for all standard stress tests (Figure 2 and Tables 4-5). Debt indicators drift upwards if primary deficits (as a share of GDP) remain fixed over the entire forecast period at their projected peak in FY16, highlighting the critical importance, as public investment is scaled up, of the assumed improvement in tax revenue from implementation of the VAT. The stress test with the larger impact on public debt indicators is the one involving materialization of contingent liabilities, following which debt indicators increase over the medium term but then stabilize.

E. Alternative Scenario

An alternative scenario considers the consequences of failing to introduce the new VAT. In that case, the tax revenue to GDP ratio would be lower by about 2 percentage points relative to the baseline. With no consolidation in expenditure assumed, the fiscal deficit would widen, leading to higher domestic borrowing costs.[4] As a result, there would be a significant deterioration in all standard public debt sustainability indicators, and the debt trajectory would become clearly unsustainable (Figure 4). This implies that in the absence of a boost to tax revenues through the introduction of the new VAT, to keep public debt on a sustainable path, a significant cut in public expenditure would eventually be needed with knock-on effects on economic growth and poverty reduction.

F. Conclusion

The macroeconomic framework is broadly unchanged from the last full DSA. The debt sustainability assessment remains unchanged and the risk of external and public debt distress continues to be classified as low. However, in the absence of a permanent boost to revenues, including for instance from a failure to implement the VAT, and with no fiscal consolidation, there would be a significant deterioration in all standard debt sustainability indicators, and the debt trajectory would become unsustainable. The authorities agreed with the main conclusions of this DSA Update.

[4] The alternative scenario assumes the same future profile for public investment and external financing as the baseline, and that domestic financing is used to meet the revenue shortfall from the failure to implement the new VAT.

Table 1. Bangladesh: DSA Key Variables 1/

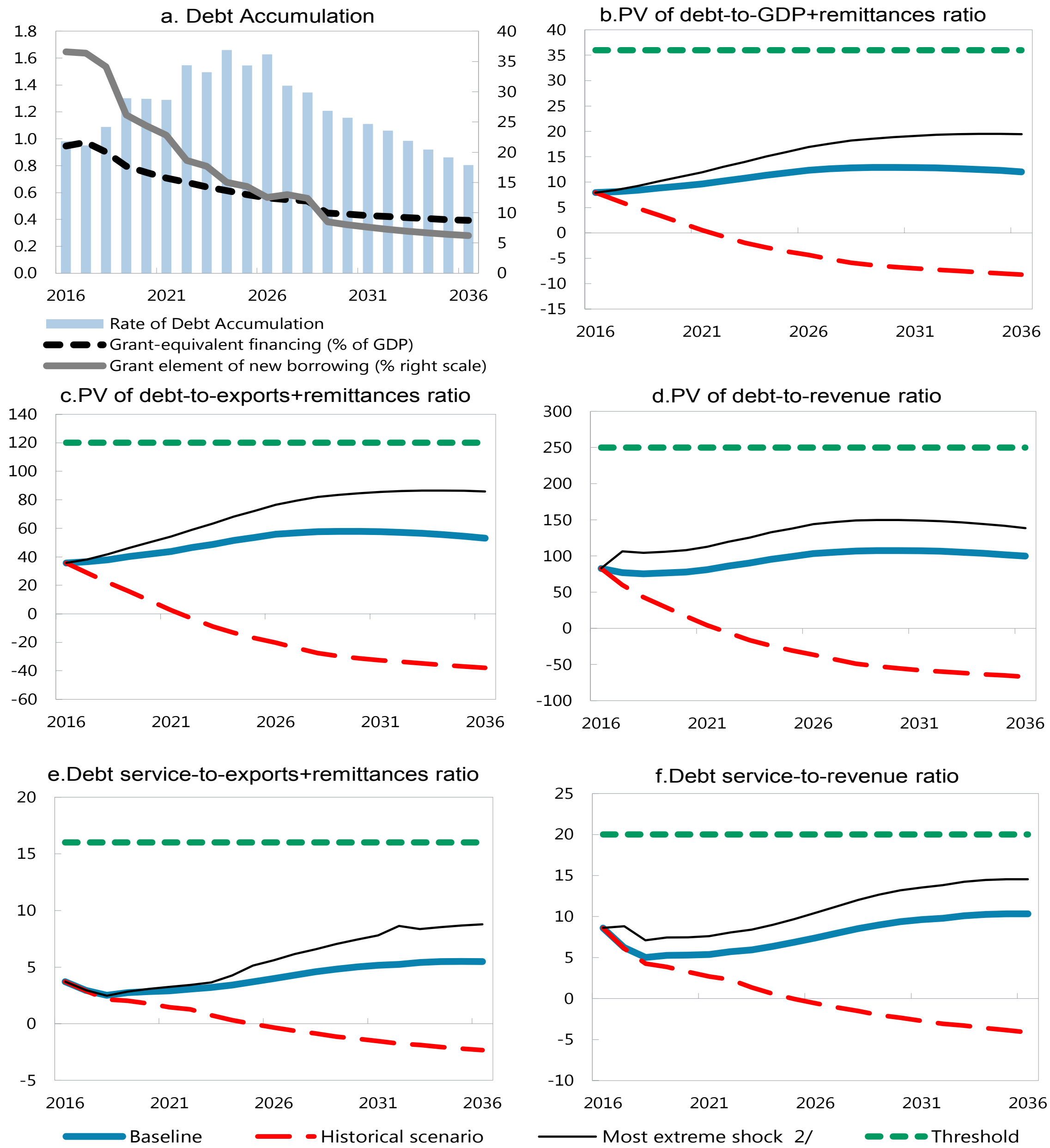
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2026	2031	2036
	(In percent of GDP, unless otherwise mentioned)											
Nominal GDP (in billions of U.S. dollars)	150	173	195	216	236	257	281	307	333	504	762	1,153
Real GDP (percentage change)	6.0	6.1	6.5	6.3	6.8	7.0	7.0	7.0	6.5	6.5	6.5	6.5
GDP deflator (percentage change)	7.2	5.7	5.8	6.8	7.4	7.0	6.7	6.7	5.7	5.2	4.7	4.7
GDP deflator (percentage change in US$)	6.2	8.7	5.8	4.5	1.9	2.1	2.1	2.0	2.0	2.0	2.0	2.0
Gross national savings	30.0	29.4	28.1	27.7	29.2	31.1	31.6	31.8	31.8	31.4	31.0	30.9
Public national savings	2.9	2.7	2.1	1.6	2.1	2.8	3.3	3.5	3.6	3.4	3.3	3.0
Private national savings	27.1	26.7	26.0	26.1	27.1	28.4	28.4	28.3	28.2	28.0	27.7	27.8
Gross investment	28.4	28.6	29.0	29.0	30.6	32.8	33.5	33.8	33.9	33.8	33.6	33.4
Public investment	6.6	6.5	6.9	7.7	8.8	9.7	10.3	10.3	10.3	10.2	9.9	9.7
Private investment	21.7	22.0	22.1	21.2	21.8	23.1	23.2	23.5	23.6	23.7	23.7	23.7
Fiscal (central government)												
Total revenue and grants	11.2	10.9	9.9	10.5	11.6	12.2	12.6	12.9	12.9	12.9	12.9	12.9
Foreign grants	0.5	0.5	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Total expenditure	14.6	14.0	13.8	14.9	15.8	16.3	16.7	16.9	16.7	16.8	16.6	16.6
Interest payments	2.0	2.1	2.0	2.1	2.3	2.3	2.2	2.3	2.1	2.1	2.1	2.2
Overall balance	-3.4	-3.1	-3.9	-4.4	-4.3	-4.1	-4.1	-4.0	-3.8	-3.9	-3.7	-3.8
Primary balance	-1.4	-1.0	-1.8	-2.4	-2.0	-1.9	-1.8	-1.7	-1.7	-1.8	-1.6	-1.6
Net domestic financing	2.2	2.1	3.1	3.4	3.3	3.2	3.0	3.0	2.9	2.9	2.8	2.8
Net external financing	0.8	0.7	0.8	1.0	1.0	1.0	1.0	1.0	0.9	1.0	0.9	1.0
Balance of payments												
Exports of goods and services	19.6	19.0	17.3	16.6	16.8	16.8	16.9	17.0	17.1	17.8	18.5	19.3
Imports of goods and services	26.4	25.3	24.8	23.9	24.0	24.1	24.1	24.2	24.2	24.3	24.3	24.4
Workers' remittances	9.6	8.2	7.8	7.2	7.0	6.8	6.6	6.4	6.3	5.6	4.9	4.3
Other current account items (net)	-1.2	-1.1	-1.2	-1.2	-1.2	-1.2	-1.2	-1.2	-1.3	-1.7	-1.8	-1.8
Current account, including official transfers	1.6	0.8	-0.8	-1.3	-1.4	-1.6	-1.8	-2.0	-2.1	-2.5	-2.7	-2.6
Foreign direct investment	1.2	0.8	0.9	0.9	1.0	1.0	1.1	1.1	1.1	1.5	2.0	2.0
External borrowing (net)	0.8	0.8	0.9	1.0	1.2	1.4	1.6	1.6	1.5	1.6	0.9	1.0
Central government	0.8	0.8	0.8	1.0	1.0	1.0	1.0	1.0	0.9	1.0	0.9	1.0
Public enterprises with guarantee	0.0	0.0	0.1	0.0	0.3	0.4	0.5	0.6	0.6	0.6	0.0	0.0
Gross official reserves	10.1	12.4	12.8	12.6	12.5	12.4	12.3	12.1	12.0	11.4	11.2	11.1
(months of prospective imports of goods and services)	4.1	5.3	5.8	5.8	5.7	5.6	5.6	5.5	5.5	5.2	5.1	5.0

Sources: Bangladesh authorities; and IMF staff estimates and projections.

1/ Data on a fiscal year basis; e.g., 2015 corresponds to July 2014–June 2015.

Figure 1. Bangladesh: Indicators of Public and Publicly Guaranteed External Debt, 2016–2036 1/

(In percent, unless otherwise mentioned)



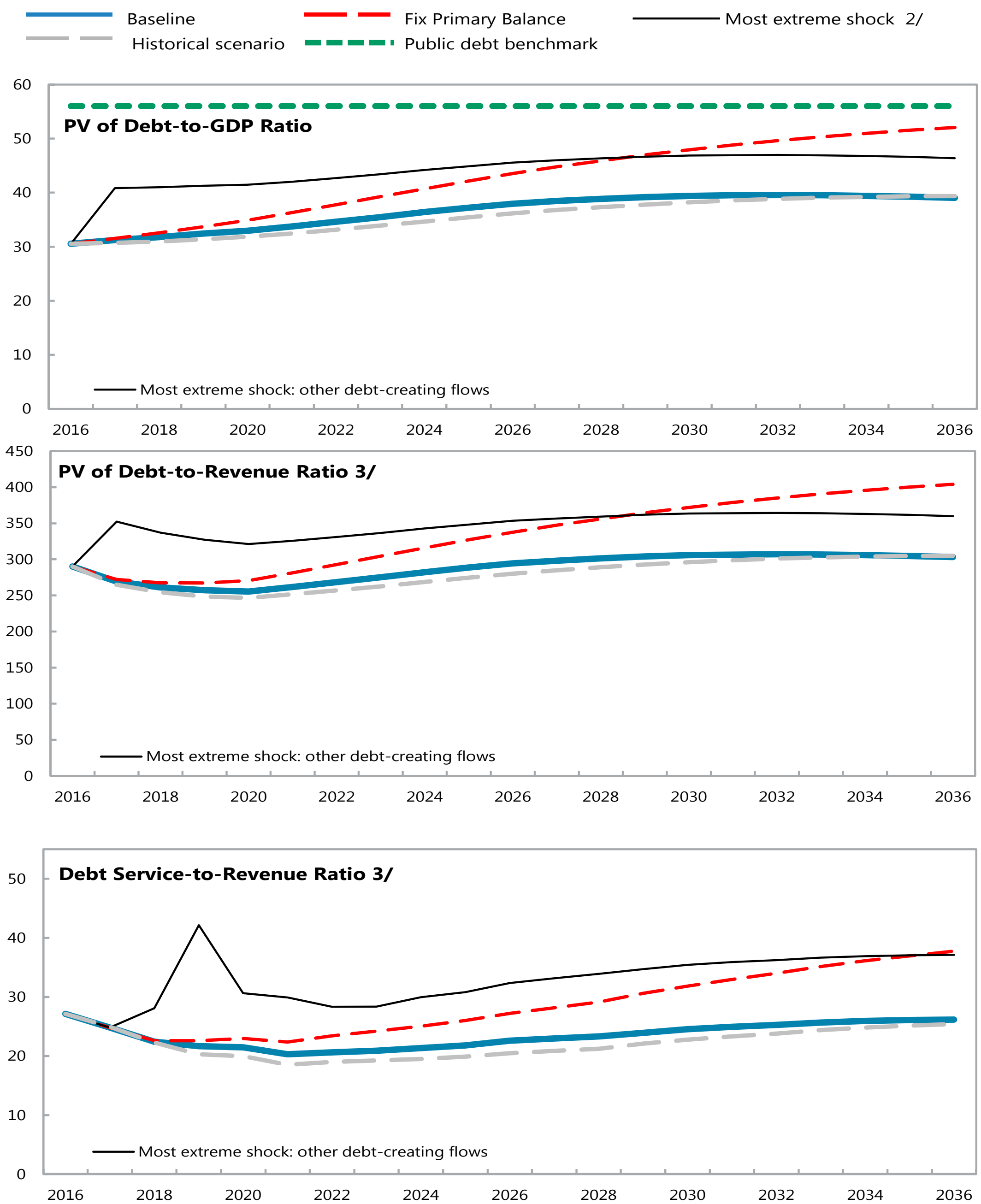
Sources: Bangladesh authorities; and IMF staff estimates and projections.

1/ Data on a fiscal year basis; e.g., 2015 corresponds to July 2014–June 2015.

2/ The most extreme stress test is the test that yields the highest ratio on or before 2026. In figure b. it corresponds to a terms shock; in c. to a terms shock; in d. to a one-time depreciation shock; in e. to a terms shock; and in figure f. to a one-time depreciation shock.

Figure 2. Bangladesh: Indicators of Public Debt, 2016–2036 1/

(In percent)



Sources: Bangladesh authorities; and IMF staff estimates and projections.
1/ Data on a fiscal year basis; e.g., 2015 corresponds to July 2014–June 2015.
2/ The most extreme stress test is the test that yields the highest ratio on or before 2026.
3/ Revenues are defined inclusive of grants.

Table 2. Bangladesh: External Debt Sustainability Framework, Baseline Scenario, 2013–2036 1/

(In percent of GDP, unless otherwise indicated)

	Actual		Est.	Historical 6/	Standard 6/	Projections									
				Average	Deviation							2016-2021			2022-2036
	2013	2014	2015			2016	2017	2018	2019	2020	2021	Average	2026	2036	Average
External debt (nominal) 1/	**16.9**	**17.6**	**16.7**			**16.8**	**16.7**	**16.4**	**16.4**	**16.3**	**16.5**		**17.7**	**15.9**	
of which: public and publicly guaranteed (PPG)	15.8	15.0	13.4			13.7	13.9	14.1	14.4	14.7	15.0		17.0	14.9	
Change in external debt	-2.2	0.7	-0.9			0.0	-0.1	-0.2	-0.1	-0.1	0.2		0.1	-0.5	
Identified net debt-creating flows	-4.9	-3.9	-2.0			-0.6	-0.6	-0.4	-0.3	-0.2	0.0		0.0	-0.4	
Non-interest current account deficit	**-1.8**	**-1.1**	**0.4**	**-0.9**	**1.3**	**0.9**	**1.0**	**1.2**	**1.4**	**1.6**	**1.6**		**2.0**	**1.9**	2.0
Deficit in balance of goods and services	6.8	6.3	7.5			7.3	7.3	7.2	7.2	7.2	7.1		6.4	5.1	
Exports	19.6	19.0	17.3			16.6	16.8	16.8	16.9	17.0	17.1		17.8	19.3	
Imports	26.4	25.3	24.8			23.9	24.0	24.1	24.1	24.2	24.2		24.3	24.4	
Net current transfers (negative = inflow)	-10.0	-8.6	-8.2	-9.2	1.0	-7.6	-7.4	-7.1	-6.9	-6.7	-6.6		-5.8	-4.5	-5.4
of which: official	-0.1	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Other current account flows (negative = net inflow)	1.3	1.3	1.1			1.2	1.1	1.1	1.1	1.1	1.2		1.4	1.3	
Net FDI (negative = inflow)	**-1.2**	**-0.8**	**-0.9**	**-0.9**	**0.1**	**-0.9**	**-1.0**	**-1.0**	**-1.1**	**-1.1**	**-1.1**		**-1.5**	**-2.0**	-1.7
Endogenous debt dynamics 2/	**-1.9**	**-2.0**	**-1.5**			**-0.6**	**-0.6**	**-0.7**	**-0.6**	**-0.6**	**-0.5**		**-0.5**	**-0.3**	
Contribution from nominal interest rate	0.2	0.3	0.4			0.3	0.4	0.4	0.4	0.4	0.5		0.5	0.7	
Contribution from real GDP growth	-1.0	-0.9	-1.0			-0.9	-1.0	-1.1	-1.1	-1.0	-1.0		-1.0	-1.0	
Contribution from price and exchange rate changes	-1.1	-1.3	-1.0			...	...	...	...	...	...		...	...	
Residual (3-4) 3/	**2.7**	**4.6**	**1.1**			**0.6**	**0.5**	**0.2**	**0.2**	**0.1**	**0.2**		**0.2**	**0.0**	
of which: exceptional financing	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
PV of external debt 4/	...	...	11.5			11.5	11.5	11.3	11.3	11.4	11.8		13.8	13.5	
In percent of exports	...	...	66.5			69.4	68.4	67.2	67.1	67.3	68.7		77.2	70.2	
PV of PPG external debt	**...**	**...**	**8.2**			**8.5**	**8.7**	**9.0**	**9.4**	**9.8**	**10.2**		**13.0**	**12.6**	
In percent of exports	**...**	**...**	**47.5**			**51.2**	**51.9**	**53.3**	**55.8**	**57.8**	**59.8**		**73.2**	**65.1**	
In percent of government revenues	**...**	**...**	**85.4**			**82.9**	**77.1**	**75.6**	**76.6**	**77.9**	**81.3**		**103.5**	**99.8**	
Debt service-to-exports ratio (in percent)	**5.9**	**5.3**	**7.7**			**9.9**	**9.0**	**7.5**	**6.9**	**6.3**	**6.1**		**6.1**	**8.5**	
PPG debt service-to-exports ratio (in percent)	**4.4**	**3.7**	**4.1**			**5.3**	**4.2**	**3.5**	**3.8**	**3.9**	**4.0**		**5.2**	**6.7**	
PPG debt service-to-revenue ratio (in percent)	**8.1**	**6.8**	**7.3**			**8.6**	**6.2**	**5.0**	**5.3**	**5.3**	**5.4**		**7.4**	**10.3**	
Total gross financing need (Billions of U.S. dollars)	-1.1	0.0	5.0			7.2	6.8	7.1	7.6	7.9	8.3		11.2	20.5	
Non-interest current account deficit that stabilizes debt ratio	0.4	-1.7	1.3			0.9	1.1	1.5	1.5	1.6	1.4		1.9	2.3	
Key macroeconomic assumptions															
Real GDP growth (in percent)	6.0	6.1	6.5	6.2	0.6	6.3	6.8	7.0	7.0	7.0	6.5	6.8	6.5	6.5	6.5
GDP deflator in US dollar terms (change in percent)	6.2	8.7	5.8	4.4	4.3	4.5	1.9	2.1	2.1	2.0	2.0	2.4	2.0	2.0	2.0
Effective interest rate (percent) 5/	1.4	1.7	2.8	1.3	0.6	2.2	2.7	2.7	2.8	2.9	3.1	2.7	3.3	4.5	3.8
Growth of exports of G&S (US dollar terms, in percent)	10.2	11.9	2.7	13.6	9.2	6.5	9.7	9.7	9.7	9.7	9.5	9.1	9.5	9.5	9.5
Growth of imports of G&S (US dollar terms, in percent)	1.4	10.7	10.4	14.0	14.9	7.0	9.4	9.4	9.4	9.4	8.7	8.9	8.7	8.7	8.7
Grant element of new public sector borrowing (in percent)	...	...	...	...	...	36.6	36.4	34.1	26.2	24.4	22.8	30.1	12.5	6.2	10.7
Government revenues (excluding grants, in percent of GDP)	10.7	10.4	9.6			10.3	11.3	11.9	12.3	12.6	12.6		12.6	12.6	12.6
Aid flows (in Billions of US dollars) 7/	2.8	3.2	3.0			3.6	3.9	4.4	4.9	4.9	5.0		8.5	18.4	
of which: Grants	0.7	0.8	0.6			0.5	0.7	0.8	0.9	0.9	1.0		1.5	3.4	
of which: Concessional loans	2.1	2.4	2.4			3.1	3.2	3.6	4.0	4.0	4.0		7.0	15.0	
Grant-equivalent financing (in percent of GDP) 8/	...	...	...			0.9	1.0	0.9	0.8	0.7	0.7		0.6	0.4	0.5
Grant-equivalent financing (in percent of external financing) 8/	...	...	...			44.1	45.7	44.2	36.7	35.4	34.3		23.6	21.2	23.5
Memorandum items:															
Nominal GDP (Billions of US dollars)	150.0	172.9	194.8			216.4	235.6	257.4	281.1	306.7	333.2		504.0	1153.3	
Nominal dollar GDP growth	12.5	15.2	12.7			11.1	8.8	9.3	9.2	9.1	8.6	9.4	8.6	8.6	8.6
PV of PPG external debt (in Billions of US dollars)			16.0			17.9	20.0	22.6	25.9	29.6	33.5		64.8	143.1	
(PVt-PVt-1)/GDPt-1 (in percent)						1.0	1.0	1.1	1.3	1.3	1.3	1.2	1.6	0.8	1.2
Gross workers' remittances (Billions of US dollars)	14.3	14.1	15.2			15.6	16.6	17.6	18.6	19.7	20.9		28.0	50.1	
PV of PPG external debt (in percent of GDP + remittances)	...	...	7.6			7.9	8.1	8.4	8.8	9.2	9.6		12.3	12.0	
PV of PPG external debt (in percent of exports + remittances)	...	...	32.8			35.7	36.6	37.9	40.1	41.9	43.7		55.8	53.2	
Debt service of PPG external debt (in percent of exports + remittances)	...	...	2.8			3.7	3.0	2.5	2.8	2.8	2.9		4.0	5.5	

Sources: Bangladesh authorities; and IMF staff estimates and projections.

1/ Includes both public and private sector external debt. Data on a fiscal year basis; e.g., 2015 corresponds to July 2014-June 2015.

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 3. Bangladesh: Sensitivity Analysis for Key Indicators for Public and Publicly Guaranteed External Debt, 2016–2036

(In percent)

	Projections							
	2016	2017	2018	2019	2020	2021	**2026**	2036
PV of debt-to-GDP+remittances ratio								
Baseline	8	8	8	9	9	10	**12**	12
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2016-2036 2/	8	6	5	3	2	1	**-4**	-8
A2. New public sector loans on less favorable terms in 2016-2036 3/	8	8	9	10	11	12	**17**	19
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2017-2018	8	8	8	9	9	10	**12**	12
B2. Export value growth at historical average minus one standard deviation in 2017-2018 4/	8	9	10	11	11	11	**13**	12
B3. US dollar GDP deflator at historical average minus one standard deviation in 2017-2018	8	8	8	9	9	10	**13**	12
B4. Net non-debt creating flows at historical average minus one standard deviation in 2017-2018 5/	8	7	7	8	8	8	**11**	12
B5. Combination of B1-B4 using one-half standard deviation shocks	8	7	7	7	8	8	**11**	12
B6. One-time 30 percent nominal depreciation relative to the baseline in 2017 6/	8	11	11	12	12	13	**17**	16
PV of debt-to-exports+remittances ratio								
Baseline	36	37	38	40	42	44	**56**	53
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2016-2036 2/	36	29	22	16	9	3	**-20**	-38
A2. New public sector loans on less favorable terms in 2016-2036 3/	36	38	42	46	50	54	**76**	86
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2017-2018	36	36	37	39	41	43	**55**	52
B2. Export value growth at historical average minus one standard deviation in 2017-2018 4/	36	40	50	52	53	55	**65**	58
B3. US dollar GDP deflator at historical average minus one standard deviation in 2017-2018	36	36	37	39	41	43	**55**	52
B4. Net non-debt creating flows at historical average minus one standard deviation in 2017-2018 5/	36	32	30	34	36	38	**52**	51
B5. Combination of B1-B4 using one-half standard deviation shocks	36	30	28	32	34	36	**51**	51
B6. One-time 30 percent nominal depreciation relative to the baseline in 2017 6/	36	36	37	39	41	43	**55**	52
PV of debt-to-revenue ratio								
Baseline	83	77	76	77	78	81	**104**	100
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2016-2036 2/	83	60	43	30	17	5	**-36**	-67
A2. New public sector loans on less favorable terms in 2016-2036 3/	83	80	83	88	93	101	**142**	161
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2017-2018	83	76	76	77	78	82	**104**	100
B2. Export value growth at historical average minus one standard deviation in 2017-2018 4/	83	82	93	92	93	95	**112**	101
B3. US dollar GDP deflator at historical average minus one standard deviation in 2017-2018	83	77	77	78	79	83	**105**	102
B4. Net non-debt creating flows at historical average minus one standard deviation in 2017-2018 5/	83	70	63	65	67	71	**96**	96
B5. Combination of B1-B4 using one-half standard deviation shocks	83	68	60	62	64	68	**94**	97
B6. One-time 30 percent nominal depreciation relative to the baseline in 2017 6/	83	107	105	106	108	113	**144**	139

Table 3. Bangladesh: Sensitivity Analysis for Key Indicators for Public and Publicly Guaranteed External Debt, 2016–2036 (Concluded)

(In percent)

	Projections							
	2016	2017	2018	2019	2020	2021	**2026**	2036
Debt service-to-exports+remittances ratio								
Baseline	4	3	3	3	3	3	**4**	5.5
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2016-2036 2/	4	3	2	2	2	1	**0**	-2
A2. New public sector loans on less favorable terms in 2016-2036 3/	4	3	2	3	3	3	**6**	9
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2017-2018	4	3	3	3	3	3	**4**	5
B2. Export value growth at historical average minus one standard deviation in 2017-2018 4/	4	3	3	3	3	4	**5**	6
B3. US dollar GDP deflator at historical average minus one standard deviation in 2017-2018	4	3	3	3	3	3	**4**	5
B4. Net non-debt creating flows at historical average minus one standard deviation in 2017-2018 5/	4	3	2	3	3	3	**4**	5
B5. Combination of B1-B4 using one-half standard deviation shocks	4	3	2	2	3	3	**3**	5
B6. One-time 30 percent nominal depreciation relative to the baseline in 2017 6/	4	3	3	3	3	3	**4**	5
Debt service-to-revenue ratio								
Baseline	9	6	5	5	5	5	**7**	10
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2016-2036 2/	9	6	4	4	3	3	**-1**	-4
A2. New public sector loans on less favorable terms in 2016-2036 3/	9	6	5	5	6	6	**10**	16
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2017-2018	9	6	5	5	5	6	**8**	11
B2. Export value growth at historical average minus one standard deviation in 2017-2018 4/	9	6	5	6	6	6	**9**	11
B3. US dollar GDP deflator at historical average minus one standard deviation in 2017-2018	9	6	5	5	5	6	**8**	11
B4. Net non-debt creating flows at historical average minus one standard deviation in 2017-2018 5/	9	6	5	5	5	5	**7**	10
B5. Combination of B1-B4 using one-half standard deviation shocks	9	6	5	5	5	5	**7**	10
B6. One-time 30 percent nominal depreciation relative to the baseline in 2017 6/	9	9	7	7	7	8	**10**	15
Memorandum item:								
Grant element assumed on residual financing (i.e., financing required above baseline) 7/	7	7	7	7	7	7	**7**	7

Sources: Bangladesh authorities; and IMF staff estimates and projections.

1/ Data on a fiscal year basis; e.g., 2015 corresponds to July 2014–June 2015.
2/ 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.
3/ 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.
4/ 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 an offsetting adjustment in import levels).
5/ Includes official and private transfers and FDI.
6/ Depreciation is defined as percentage decline in dollar/local currency rate, such that it never exceeds 100 percent.
7/ 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, 2013–2036

(In percent of GDP, unless otherwise indicated)

	Actual		Est.			Projections									
	2013	2014	2015	Average 5/	Standard Deviation 5/	2016	2017	2018	2019	2020	2021	2016-21 Average	2026	2036	2022-36 Average
Public sector debt 1/	35.8	35.3	34.6			35.8	36.4	36.9	37.5	37.8	38.5		41.9	41.4	
of which: foreign-currency denominated	15.8	15.0	13.4			13.7	13.9	14.1	14.4	14.7	15.0		17.0	14.9	
Change in public sector debt	-0.4	-0.5	-0.7			1.2	0.6	0.5	0.5	0.4	0.6		0.6	-0.3	
Identified debt-creating flows	-1.8	-0.8	0.0			1.0	0.5	0.4	0.5	0.3	0.6		0.6	0.1	
Primary deficit	1.4	1.0	1.7	1.2	0.5	2.3	2.0	1.8	1.8	1.6	1.6	1.8	1.5	1.1	1.3
Revenue and grants	11.2	10.9	9.9			10.5	11.6	12.2	12.6	12.9	12.9		12.9	12.9	
of which: grants	0.5	0.5	0.3			0.3	0.3	0.3	0.3	0.3	0.3		0.3	0.3	
Primary (noninterest) expenditure	12.6	11.9	11.7			12.8	13.5	14.0	14.4	14.5	14.5		14.4	14.0	
Automatic debt dynamics	-3.1	-1.8	-1.8			-1.4	-1.7	-1.8	-1.7	-1.8	-1.5		-1.5	-1.3	
Contribution from interest rate/growth differential	-1.4	-1.2	-1.2			-1.3	-1.6	-1.7	-1.6	-1.6	-1.4		-1.4	-1.2	
of which: contribution from average real interest rate	0.6	0.9	1.0			0.7	0.6	0.7	0.8	0.8	0.9		1.1	1.3	
of which: contribution from real GDP growth	-2.1	-2.0	-2.2			-2.0	-2.3	-2.4	-2.4	-2.5	-2.3		-2.5	-2.5	
Contribution from real exchange rate depreciation	-1.7	-0.6	-0.6			-0.1	0.0	0.0	-0.1	-0.1	-0.1		...	...	
Other identified debt-creating flows	0.0	0.0	0.0			0.1	0.2	0.3	0.4	0.5	0.6		0.7	0.3	
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			0.1	0.2	0.3	0.4	0.5	0.6		0.7	0.3	
Residual, including asset changes	1.4	0.3	-0.7			0.2	0.1	0.0	0.0	0.0	0.0		0.0	-0.4	
Other Sustainability Indicators															
PV of public sector debt	...	...	29.4			30.6	31.2	31.8	32.5	33.0	33.7		38.0	39.1	
of which: foreign-currency denominated	...	...	8.2			8.5	8.7	9.0	9.4	9.8	10.2		13.0	12.6	
of which: external	...	...	8.2			8.5	8.7	9.0	9.4	9.8	10.2		13.0	12.6	
PV of contingent liabilities (not included in public sector debt)	...	...	...			...	...	...	...	...	...		...	...	
Gross financing need 2/	5.2	4.5	4.9			5.5	5.0	4.6	4.6	4.4	4.2		4.4	4.5	
PV of public sector debt-to-revenue and grants ratio (in percent)	...	...	295.5			290.3	269.3	261.2	257.1	255.6	261.6		294.5	303.1	
PV of public sector debt-to-revenue ratio (in percent)	...	...	304.5			297.5	276.7	268.1	263.6	261.8	268.0		301.5	310.2	
of which: external 3/	...	...	85.4			82.9	77.1	75.6	76.6	77.9	81.3		103.5	99.8	
Debt service-to-revenue and grants ratio (in percent) 4/	24.5	24.6	26.6			27.1	24.8	22.4	21.6	21.5	20.3		22.6	26.2	
Debt service-to-revenue ratio (in percent) 4/	25.6	25.7	27.4			27.8	25.5	23.0	22.2	22.0	20.8		23.1	26.8	
Primary deficit that stabilizes the debt-to-GDP ratio	1.8	1.5	2.5			1.1	1.3	1.4	1.2	1.2	0.9		0.9	1.4	
Key macroeconomic and fiscal assumptions															
Real GDP growth (in percent)	6.0	6.1	6.5	6.2	0.6	6.3	6.8	7.0	7.0	7.0	6.5	6.8	6.5	6.5	6.5
Average nominal interest rate on forex debt (in percent)	1.0	0.9	1.6	1.0	0.2	1.1	1.0	1.3	1.7	2.1	2.3	1.6	3.1	4.1	3.4
Average real interest rate on domestic debt (in percent)	4.2	5.1	4.8	3.8	1.1	3.6	3.7	3.6	3.5	3.5	3.5	3.6	3.6	3.9	3.7
Real exchange rate depreciation (in percent, + indicates depreciation)	-9.9	-4.1	-4.1	-2.6	5.1	-0.9	...	...	...	...	...	...	...	...	...
Inflation rate (GDP deflator, in percent)	7.2	5.7	5.8	6.8	1.0	6.8	7.4	7.0	6.7	6.7	5.7	6.7	5.2	4.7	4.9
Growth of real primary spending (deflated by GDP deflator, in percent)	9.1	0.2	4.4	1.4	3.0	17.0	12.7	10.7	9.9	7.7	6.3	10.7	6.3	6.4	6.3
Grant element of new external borrowing (in percent)	...	...	...	...	...	36.6	36.4	34.1	26.2	24.4	22.8	30.1	12.5	6.2	...

Sources:Bangladesh authorities; and IMF staff estimates and projections.

1/ 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 refer to fiscal years. For example, 2015 refers to July 2014-June 2015.

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 5. Bangladesh: Sensitivity Analysis for Key Indicators of Public Debt, 2016–2036
(In percent)

	Projections							
	2016	2017	2018	2019	2020	2021	**2026**	2036
PV of Debt-to-GDP Ratio								
Baseline	31	31	32	32	33	34	**38**	39
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	31	31	31	31	32	32	**36**	39
A2. Primary balance is unchanged from 2016	31	32	33	34	35	36	**44**	52
A3. Permanently lower GDP growth 2/	31	31	32	33	33	34	**39**	42
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2017-2018	31	32	33	34	35	36	**41**	44
B2. Primary balance is at historical average minus one standard deviations in 2017-2018	31	31	31	32	33	33	**38**	39
B3. Combination of B1-B2 using one half standard deviation shocks	31	31	32	32	33	34	**40**	42
B4. One-time 30 percent real depreciation in 2017	31	35	35	35	36	36	**41**	44
B5. 10 percent of GDP increase in other debt-creating flows in 2017	31	41	41	41	41	42	**46**	46
PV of Debt-to-Revenue Ratio 3/								
Baseline	290	269	261	257	256	262	**294**	303
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	290	265	254	248	247	252	**280**	305
A2. Primary balance is unchanged from 2016	290	272	268	267	270	281	**338**	404
A3. Permanently lower GDP growth 2/	290	270	262	259	258	265	**303**	329
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2017-2018	290	273	271	269	269	277	**320**	343
B2. Primary balance is at historical average minus one standard deviations in 2017-2018	290	267	258	254	253	259	**292**	302
B3. Combination of B1-B2 using one half standard deviation shocks	290	267	259	257	258	266	**308**	329
B4. One-time 30 percent real depreciation in 2017	290	299	287	280	277	282	**318**	343
B5. 10 percent of GDP increase in other debt-creating flows in 2017	290	352	337	327	321	326	**353**	360
Debt Service-to-Revenue Ratio 3/								
Baseline	27	25	22	22	21	20	**23**	26
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	27	25	22	20	20	19	**20**	25
A2. Primary balance is unchanged from 2016	27	25	23	23	23	22	**27**	38
A3. Permanently lower GDP growth 2/	27	25	22	22	22	21	**23**	29
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2017-2018	27	25	23	23	23	22	**25**	31
B2. Primary balance is at historical average minus one standard deviations in 2017-2018	27	25	22	21	21	20	**22**	26
B3. Combination of B1-B2 using one half standard deviation shocks	27	25	23	21	21	21	**24**	29
B4. One-time 30 percent real depreciation in 2017	27	26	25	24	25	24	**28**	36
B5. 10 percent of GDP increase in other debt-creating flows in 2017	27	25	28	42	31	30	**32**	37

Sources: Bangladesh authorities; and IMF staff estimates and projections.

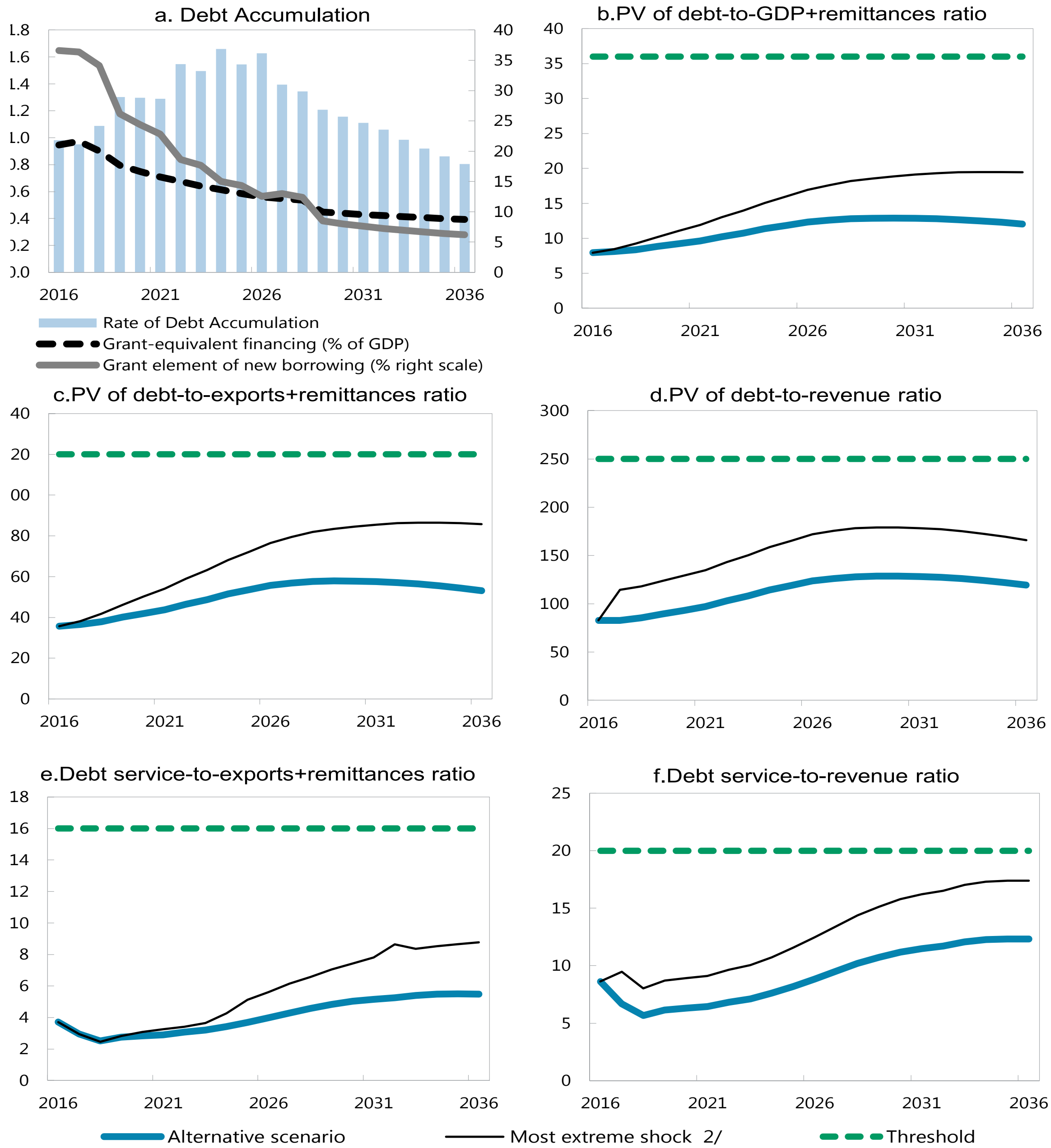
1/ Data on a fiscal year basis; e.g., 2015 corresponds to July 2014–June 2015.

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

3/ Revenues are defined inclusive of grants.

Figure 3. Bangladesh: Alternative Scenario — Indicators for Public and Publicly Guaranteed External Debt, 2016–2036 1/

(In percent, unless otherwise mentioned)



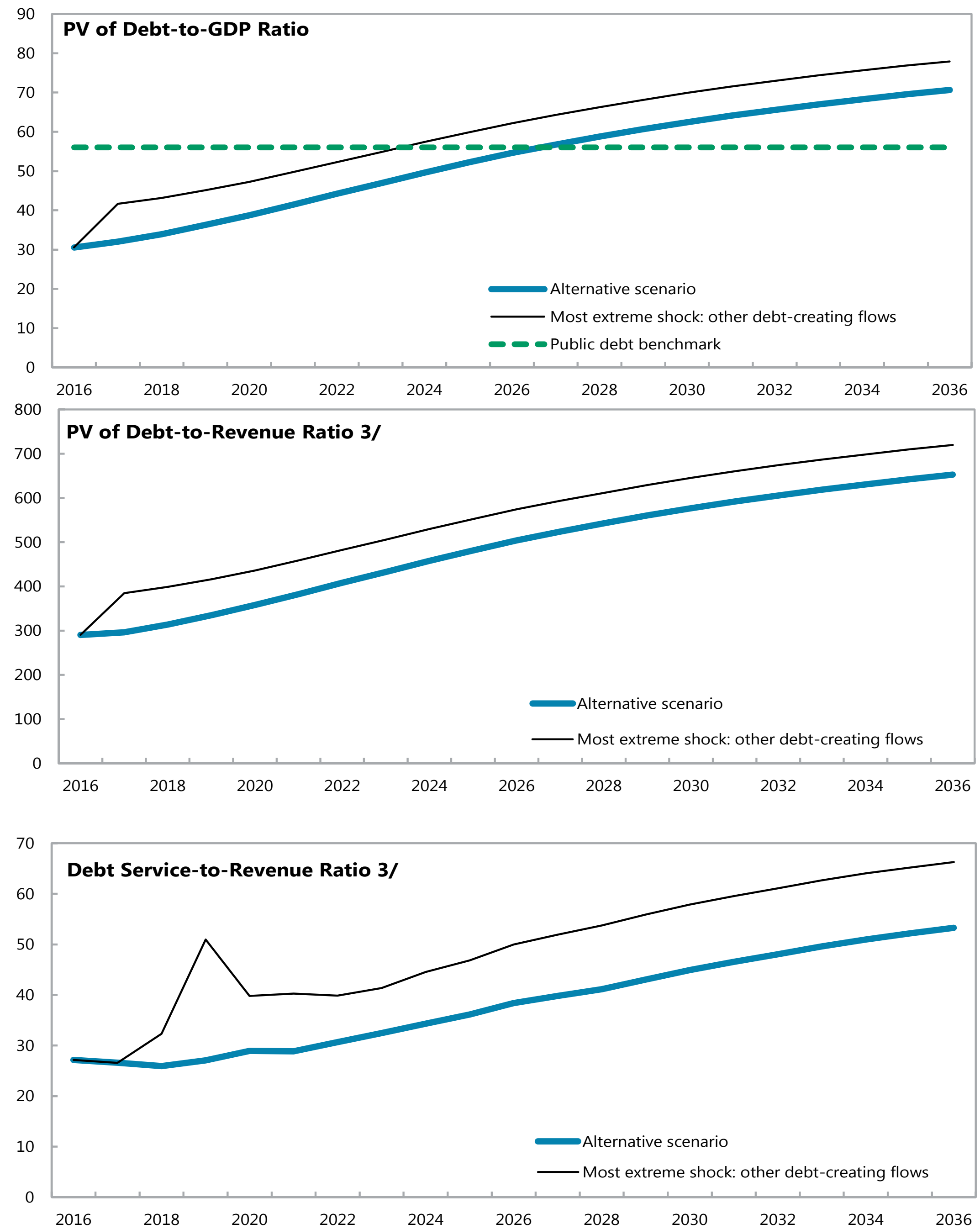
Sources: Bangladesh authorities; and IMF staff estimates and projections.

1/ Data on a fiscal year basis; e.g., 2015 corresponds to July 2014–June 2015.

2/ The most extreme stress test is the test that yields the highest ratio on or before 2026. In figure b. it corresponds to a terms shock; in c. to a terms shock; in d. to a one-time depreciation shock; in e. to a terms shock; and in figure f. to a one-time depreciation shock.

Figure 4. Bangladesh: Alternative Scenario — Indicators for Public Debt, 2016–2036 1/2/

(In percent)



Sources: Bangladesh authorities; and IMF staff estimates and projections.
1/ Data on a fiscal year basis; e.g., 2015 corresponds to July 2014–June 2015.
2/ The most extreme stress test is the test that yields the highest ratio on or before 2026.
3/ Revenues are defined inclusive of grants.