BANGLADESH

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STAFF REPORT FOR THE 2013 ARTICLE IV CONSULTATION AND THIRD REVIEW 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 May 14, 2013, reflecting the most recent macroeconomic developments and borrowing needs.[1] The results indicate that Bangladesh remains at a low risk of debt distress.[2] The authorities agreed with the assessment.

1.   **At end-FY13 (i.e., end-June 2013), the components of Bangladesh's public debt stock for DSA purposes were as follows:**

- Public and publicly guaranteed external debt, with a face value equivalent to about 18 percent of GDP, about 81 percent of which is owed to multilateral creditors; and

- Domestic debt, which amounted to 21 percent of GDP, comprising Treasury bonds and bills (60 percent), National Savings Instruments (29 percent), and government overdrafts at the central bank (10 percent).

Bangladesh: Public and Publicly Guaranteed External Debt (At end-June 2013)		
	In Millions of U.S. Dollars	In Percent of Total External Debt
Multilateral debt	19,837	81.2
World Bank	11,329	46.4
Asian Development Bank	7,288	29.8
International Monetary Fund	596	2.4
International Fund for Agricultural Development	320	1.3
Islamic Development Bank	199	0.8
Other	107	0.4
Bilateral debt	2,965	12.1
Japan	1,950	8.0
China	288	1.2
Korea, Republic of	269	1.1
Kuwait	144	0.6
India	96	0.4
United States	69	0.3
Other	147	0.6
Guarantees provided to external borrowing by state-owned enterprises	143	0.6
Short-term debt	1,471	6.0
Total	24,416	100.0
(Percent of GDP)	18.3	
Sources: Bangladesh authorities; and IMF staff estimates.		

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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, and 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.

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

Bangladesh: Public Domestic Debt (At end-June 2013)		
	In Billions of Taka	In Percent of Total Domestic Debt
Treasury bonds	1,013	46.3
National saving directorate instrument	644	29.4
Treasury bills	294	13.4
Overdraft	219	10.0
Ways and means advance	20	0.9
Total	2,190	
(Percent of GDP)	21.0	
General Provident Fund	244	

Sources: Bangladesh authorities; and IMF staff estimates.

- **Real growth and nominal GDP.** Long-term real GDP growth for the FY25–34 period has been increased slightly to an annual average of 6½ percent (compared to 6 percent in the previous DSA), on the assumption that investment in infrastructure and structural reforms will increase potential long-term growth. 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. Foreign direct investment is projected to remain at about 1 percent of GDP over the medium term and then to increase to about 2 percent of GDP by FY24 and 2½ percent of GDP by FY34 as a result of the improving business climate and further liberalization of the capital account. Because of revised projections of real growth, and other minor revisions to near-term inflation, nominal GDP measured in U.S. dollars is now 9 percent higher by FY18 and 29 percent higher by FY33.

- **Discount rate.** The Executive Boards of the IMF and the World Bank approved in October a decision to revise up the discount rate used for DSA calculations to 5 percent, from 3 percent. This DSA update reflects the new discount rate.

- **Grant element of new borrowing.** The average grant element of new borrowing has increased as a result of using a higher discount rate. However, this DSA update assumes a steeper decline in the projected grant element of new borrowing (it declines from about 22 percent in FY19 to 10 percent in FY34, Figure 1.a), reflecting a gradual shift toward more nonconcessional borrowing.

- **Remittances.** Earnings from remittances have been revised downward, on the assumption that domestic labor demand will be higher and migrant outflows consequently lower. Remittances are now projected at just below 6 percent of GDP by the end of the forecast period, compared to 9 percent of GDP in the previous DSA.

- **Primary fiscal deficit.** The primary fiscal deficit is higher than in the previous DSA by about ¼ percent of GDP a year over the long term, mainly reflecting an increase in social-related expenses as well as a demographics-driven rise in pension outlays to civil servants.

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[3] IMF Country Report No. 13/157 (June 2013).

BASELINE SCENARIO

3.   External debt. The present value (PV) of public and publicly guaranteed (PPG) external debt is expected to fall slightly over the long run to 9 percent of GDP plus remittances by FY34 (from 10 percent in FY14). All external debt indicators remain well below the policy-dependent debt burden thresholds (adjusted for remittances) under the baseline scenario and all bound tests (see Table 3).

4.   Public sector debt. The PV of the public sector debt-to-GDP ratio is projected to fall gradually to about 27 percent of GDP by FY34 (from 33 percent in FY13).

ALTERNATIVE SCENARIOS

5.   Alternative assumptions and outcome. This DSA update considers two alternative scenarios:

- The first scenario (Figures 3 and 4) assumes a combination of shocks to PPG debt: (i) issuance of a US$1.0 billion (0.6 percent of GDP) sovereign bond (with 10-year maturity) in FY15; (ii) new nonconcessional borrowing of US$6 billion (2.5 percent of GDP in FY19) to construct two 1,000 megawatt nuclear reactors during FY17–21;[4] and (iii) beyond what is already considered in the baseline, an additional recapitalization of state-owned banks of about 2.2 percent of GDP over FY14 and FY15 (split evenly in the two years).[5] Under this scenario, the present value of PPG external debt as a share of GDP plus remittances increases over the medium term, peaks at 14 percent in FY21, and then declines to 9 percent by FY34. The present value of total public debt rises very slightly as a share of GDP over the first two years, and then declines over the medium term. The risk of external debt distress remains low in this scenario.[6]

- The second scenario (Figures 5 and 6) is a robustness test on the sensitivity of the baseline results to permanently slower growth. GDP growth in Bangladesh has averaged 6.2 percent over the past 10 years, with a standard deviation of 0.3 percent. Given the relative stability of growth in recent years, a temporary or even a permanent growth shock of one or two standard deviations would have little impact on overall outcomes. This scenario considers a much larger growth shock of 2 percentage points (more than six times the standard deviation) starting in FY14 and throughout the entire projection horizon. The accumulation of new external debt is assumed to be identical to the baseline. Even though there would be a considerable increase in debt ratios, the risk of external debt distress remains low in this scenario.

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[4] While current cost estimates cited in Bangladesh are in the range of US$4–8 billion, these figures remain to be verified by feasibility studies.

[5] The baseline scenario includes recapitalization costs of state-owned commercial and specialized banks of Tk 70 billion in FY14, and assumes a further Tk 75 billion in FY15. This alternative scenario assumes a full write-off of all nonperforming loans (NPLs) as well as of fraudulent loans that have not yet been classified as NPLs, and the additional recapitalization needs are estimated on the basis of what is needed to restore state-owned banks' tangible capital to the regulatory minimum.
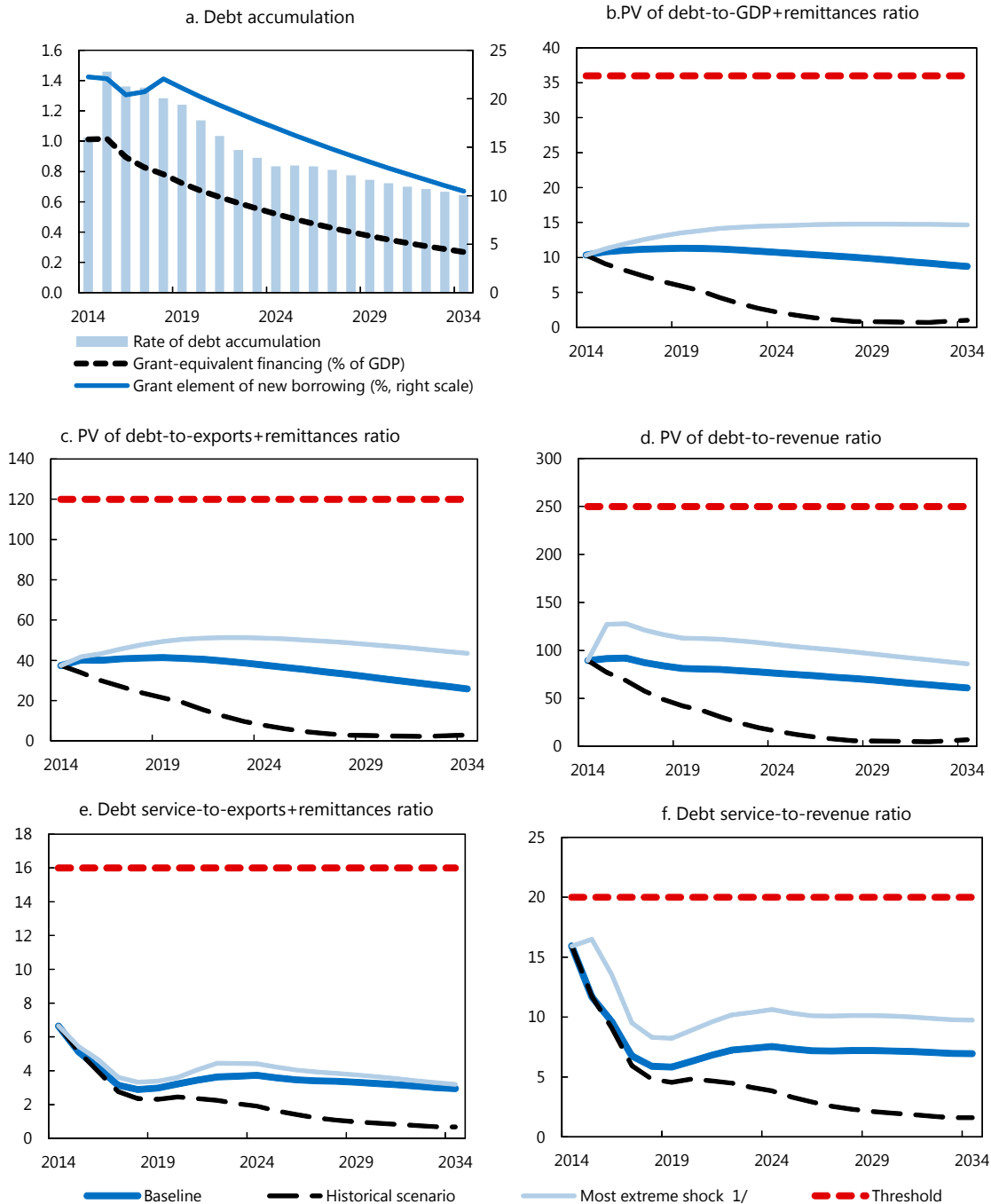
[6] If the sovereign bond and the external financing for the construction of the nuclear power plant were rolled over at the time of maturity, external debt accumulation would increase but external debt ratios would still remain well below the relevant thresholds.

Table 1. Bangladesh: DSA Update: Key Variables 1/

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2024	2029	2034
						(Percent of GDP, unless otherwise indicated)						
Nominal GDP (US$ billions)	112	116	130	152	167	183	201	221	243	381	594	928
Real GDP (percentage change)	6.7	6.2	6.0	5.5	6.5	6.5	7.0	7.0	7.0	6.5	6.5	6.5
GDP deflator (percentage change)	7.5	8.5	6.6	7.6	6.7	5.9	5.6	5.6	5.6	4.5	4.5	4.5
Fiscal (central government)												
Total revenue and grants	11.9	12.9	12.9	13.2	13.4	13.5	14.3	15.0	15.5	15.4	15.3	15.2
Foreign grants	0.3	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.3	0.2	0.2	0.1
Total expenditure	16.0	16.3	16.9	16.9	17.0	16.6	16.9	17.1	17.4	17.5	17.5	17.5
Interest payments	2.0	2.2	2.3	2.2	2.0	1.8	1.8	1.8	1.7	1.5	1.5	1.6
Overall balance	-4.1	-3.4	-4.0	-3.7	-3.6	-3.1	-2.6	-2.1	-2.0	-2.1	-2.2	-2.3
Primary balance	-2.2	-1.2	-1.7	-1.6	-1.6	-1.3	-0.8	-0.3	-0.3	-0.6	-0.6	-0.7
Net domestic financing	3.8	2.4	2.2	3.0	2.3	1.8	1.5	1.2	1.2	1.7	1.9	2.1
Net external financing	0.4	0.8	1.2	0.8	1.3	1.3	1.1	0.9	0.8	0.5	0.3	0.2
Balance of payments												
Exports of goods and services	22.5	23.0	22.6	20.7	20.0	20.8	20.9	21.0	21.2	23.1	26.2	29.9
Imports of goods and services	34.3	33.6	30.5	28.6	29.0	29.2	29.0	28.8	28.6	30.2	32.1	35.2
Workers' remittances	10.4	11.0	11.0	9.6	9.4	9.3	9.0	8.8	8.6	7.5	6.6	5.8
Current account, including official transfers	-2.0	-0.4	1.9	0.2	-1.2	-0.8	-0.8	-0.8	-0.7	-1.6	-1.6	-1.6
Foreign direct investment	0.7	1.0	1.0	0.9	1.0	1.0	1.0	1.0	1.1	2.0	2.1	2.5
External borrowing												
Central government	0.9	1.5	1.9	1.5	1.9	1.9	1.6	1.4	1.4	1.2	1.0	0.9
Public enterprises with guarantee	0.0	0.0	0.0	0.1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Gross official reserves	3.0	3.1	4.2	4.2	4.3	4.5	4.7	4.9	4.9	5.0	5.0	5.0
(Months of imports of goods and services)												

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

1/ Data on a fiscal year basis, with 2014 corresponding to July 2013–June 2014.

Figure 1. Bangladesh: Indicators of Public and Publicly Guaranteed External Debt under Different Assumptions, 2014–34 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
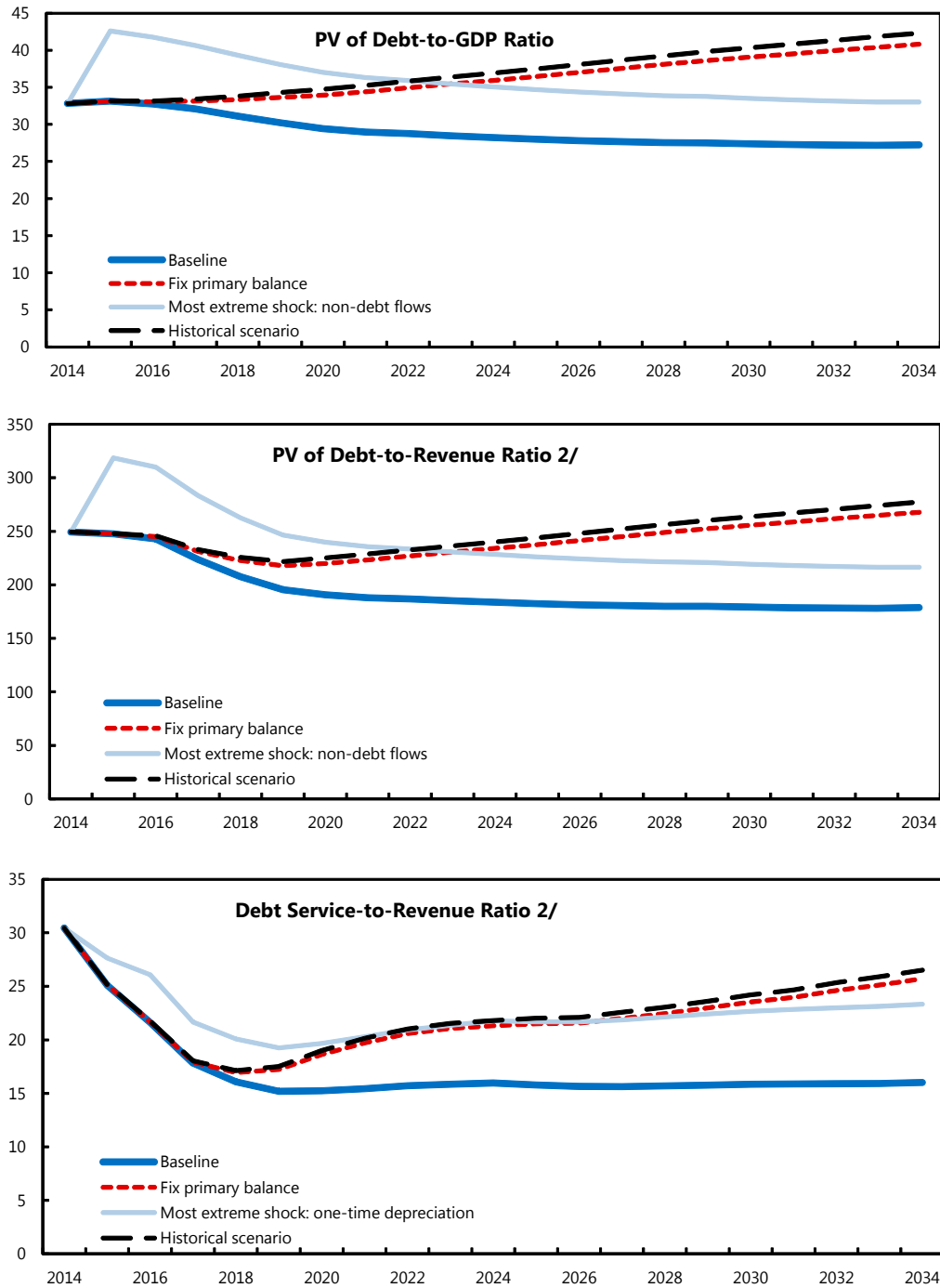
Sources: Bangladesh authorities; and IMF staff estimates and projections.

1/ The most extreme stress test is the test that yields the highest ratio in 2024. 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 non-debt flows shock and in figure f. to a one-time depreciation shock.

Figure 2. Bangladesh: Indicators of Public Debt under Different Assumptions, 2014–34 1/

(In percent)

PV of Debt-to-GDP Ratio

- Baseline
- Fix primary balance
- Most extreme shock: non-debt flows
- Historical scenario

PV of Debt-to-Revenue Ratio 2/

- Baseline
- Fix primary balance
- Most extreme shock: non-debt flows
- Historical scenario

Debt Service-to-Revenue Ratio 2/

- Baseline
- Fix primary balance
- Most extreme shock: one-time depreciation
- Historical scenario

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

1/ The most extreme stress test is the test that yields the highest ratio in 2024.

2/ Revenues are defined inclusive of grants.

Table 2. Bangladesh: External Debt Sustainability Framework, Baseline Scenario, 2011–34
(In percent of GDP, unless otherwise indicated)

	Actual			Historical [1/] Average	Standard [1/] Deviation	Projections						2014–2019 Average	2024	2034	2020–2034 Average
	2011	2012	2013			2014	2015	2016	2017	2018	2019				
External debt (nominal) 2/	**22.7**	**22.0**	**19.6**			**18.3**	**18.6**	**18.5**	**18.3**	**18.1**	**18.0**		**17.0**	**14.2**	
Of which: Public and publicly guaranteed (PPG)	21.4	20.6	18.3			17.2	17.5	17.4	17.3	17.2	17.0		15.4	11.8	
Change in external debt	0.3	-0.7	-2.4			-1.3	0.2	-0.1	-0.1	-0.2	-0.2		-0.2	-0.3	
Identified net debt-creating flows	-1.0	-1.4	-5.3			-2.0	-0.8	-1.3	-1.4	-1.4	-1.5		-1.4	-1.7	
Non-interest current account deficit	**1.8**	**0.1**	**-2.2**	**-1.0**	**1.6**	**-0.5**	**0.9**	**0.4**	**0.4**	**0.3**	**0.3**		**1.0**	**1.0**	1.0
Deficit in balance of goods and services	11.8	10.6	7.8			7.9	9.0	8.4	8.1	7.8	7.4		7.1	5.3	
Exports	22.5	23.0	22.6			20.7	20.0	20.8	20.9	21.0	21.2		23.1	29.9	
Imports	34.3	33.6	30.5			28.6	29.0	29.2	29.0	28.8	28.6		30.2	35.2	
Net current transfers (negative = inflow)	-11.1	-11.6	-11.6	-10.0	1.9	-10.0	-9.8	-9.7	-9.4	-9.2	-8.9		-7.8	-5.9	-7.2
Of which: Official	-0.1	-0.1	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)	1.1	1.0	1.5			1.6	1.6	1.7	1.7	1.7	1.8		1.7	1.7	
Net FDI (negative = inflow)	**-0.7**	**-1.0**	**-1.0**	**-1.0**	**0.2**	**-0.9**	**-1.0**	**-1.0**	**-1.0**	**-1.0**	**-1.1**		**-2.0**	**-2.5**	-2.1
Endogenous debt dynamics 3/	**-2.1**	**-0.5**	**-2.1**			**-0.6**	**-0.7**	**-0.7**	**-0.8**	**-0.7**	**-0.7**		**-0.5**	**-0.3**	
Contribution from nominal interest rate	0.2	0.3	0.3			0.3	0.4	0.4	0.4	0.5	0.5		0.6	0.6	
Contribution from real GDP growth	-1.3	-1.4	-1.2			-0.9	-1.1	-1.1	-1.2	-1.2	-1.2		-1.0	-0.9	
Contribution from price and exchange rate changes	-1.0	0.6	-1.2			...	...	...	...	...	...		...	...	
Residual (3-4) 4/	**1.3**	**0.8**	**2.9**			**0.7**	**1.0**	**1.2**	**1.2**	**1.2**	**1.4**		**1.2**	**1.4**	
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/	...	...	13.1			12.5	12.9	13.0	13.2	13.2	13.2		13.2	11.6	
In percent of exports	...	...	58.0			60.1	64.5	63.1	62.9	62.6	62.6		57.0	39.0	
PV of PPG external debt	**...**	**...**	**11.9**			**11.3**	**11.8**	**12.0**	**12.2**	**12.3**	**12.3**		**11.5**	**9.2**	
In percent of exports	**...**	**...**	**52.4**			**54.6**	**59.1**	**57.9**	**58.4**	**58.4**	**58.1**		**49.8**	**30.8**	
In percent of government revenues	**...**	**...**	**95.6**			**89.6**	**91.5**	**92.1**	**87.3**	**83.9**	**81.2**		**76.2**	**61.0**	
Debt service-to-exports ratio (in percent)	**4.1**	**5.7**	**5.9**			**11.1**	**8.9**	**7.3**	**5.7**	**5.2**	**5.3**		**6.5**	**5.5**	
PPG debt service-to-exports ratio (in percent)	**3.8**	**4.8**	**4.4**			**9.7**	**7.5**	**6.0**	**4.5**	**4.1**	**4.2**		**4.9**	**3.5**	
PPG debt service-to-revenue ratio (in percent)	**7.4**	**8.8**	**8.1**			**15.9**	**11.7**	**9.6**	**6.8**	**5.9**	**5.8**		**7.5**	**6.9**	
Total gross financing need (billions of U.S. dollars)	2.4	1.1	-0.8			2.9	3.8	2.5	1.6	1.1	0.7		2.2	1.9	
Non-interest current account deficit that stabilizes debt ratio	1.5	0.7	0.2			0.7	0.6	0.5	0.5	0.5	0.5		1.3	1.3	
Key macroeconomic assumptions															
Real GDP growth (in percent)	6.7	6.2	6.0	6.2	0.3	5.5	6.5	6.5	7.0	7.0	7.0	6.6	6.5	6.5	6.5
GDP deflator in U.S. dollar terms (change in percent)	4.5	-2.4	5.5	3.3	4.1	10.6	3.3	2.9	2.8	2.8	2.7	4.2	2.6	2.6	2.6
Effective interest rate (percent) 6/	0.9	1.5	1.4	1.1	0.2	2.1	2.2	2.4	2.5	2.7	2.9	2.5	3.6	4.6	3.9
Growth of exports of G&S (U.S. dollar terms, in percent)	34.5	6.0	10.2	15.1	8.3	6.9	5.9	13.9	10.5	10.7	10.7	9.8	11.4	12.2	11.9
Growth of imports of G&S (U.S. dollar terms, in percent)	50.0	1.6	1.4	15.2	14.9	9.5	11.6	10.2	9.2	9.2	9.2	9.8	10.0	11.3	10.9
Grant element of new public sector borrowing (in percent) 7/	...	...	...	...	...	22.3	22.1	20.4	20.7	22.1	21.1	21.4	17.0	10.5	15.0
Government revenues (excluding grants, in percent of GDP)	11.7	12.4	12.4			12.6	12.9	13.0	13.9	14.6	15.1		15.1	15.1	15.1
Aid flows (in billions of U.S. dollars) 8/	1.3	2.3	3.1			1.6	1.7	1.7	1.7	1.8	1.8		2.0	2.6	
Of which: Grants	0.3	0.6	0.6			0.8	0.8	0.8	0.8	0.8	0.8		0.9	1.2	
Of which: Concessional loans	1.1	1.7	2.4			0.8	0.9	0.9	0.9	1.0	1.0		1.1	1.4	
Grant-equivalent financing (in percent of GDP) 8/	...	...	...			1.0	1.0	0.9	0.8	0.8	0.7		0.5	0.3	0.4
Grant-equivalent financing (in percent of external financing) 9/	...	...	...			37.4	34.9	33.5	33.6	34.5	33.1		27.4	18.2	24.7
Memorandum items:															
Nominal GDP (billions of U.S. dollars)	111.9	116.0	129.9			151.5	166.7	182.6	200.9	220.8	242.7		380.7	927.9	
Nominal dollar GDP growth	11.5	3.7	11.9			16.7	10.0	9.6	10.0	9.9	9.9	11.0	9.3	9.3	9.4
PV of PPG external debt (in billions of U.S. dollars)			15.8			17.2	19.4	21.6	24.1	26.7	29.4		43.4	86.0	
(PVt-PVt-1)/GDPt-1 (in percent)						1.0	1.5	1.4	1.4	1.3	1.2	1.3	0.8	0.6	0.8
Gross workers' remittances (billions of U.S. dollars)	11.7	12.7	14.3			14.5	15.6	16.9	18.2	19.4	20.8		28.5	53.5	
PV of PPG external debt (in percent of GDP + remittances)	...	...	10.7			10.3	10.8	11.0	11.2	11.3	11.3		10.7	8.7	
PV of PPG external debt (in percent of exports + remittances)	...	...	35.2			37.4	40.2	40.0	40.7	41.1	41.3		37.7	25.9	
Debt service of PPG external debt (in percent of exports + remittances)	...	...	3.0			6.6	5.1	4.2	3.2	2.9	3.0		3.7	2.9	

Sources: 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 refer to fiscal years. For example, 2014 refers to July 2013-June 2014.
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, 2014–34

(In percent)

				Projections				
	2014	2015	2016	2017	2018	2019	**2024**	2034
PV of debt-to-GDP+remittances ratio								
Baseline	10	11	11	11	11	11	**11**	9
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2014-2034 1/	10	9	8	7	7	6	**2**	1
A2. New public sector loans on less favorable terms in 2014-2034 2/	10	11	12	13	13	14	**15**	15
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2015-2016	10	11	11	11	11	11	**11**	9
B2. Export value growth at historical average minus one standard deviation in 2015-2016 3/	10	10	12	12	12	12	**11**	9
B3. U.S. dollar GDP deflator at historical average minus one standard deviation in 2015-2016	10	11	12	12	12	12	**11**	9
B4. Net non-debt-creating flows at historical average minus one standard deviation in 2015-2016 4/	10	12	14	14	14	14	**12**	9
B5. Combination of B1-B4 using one-half standard deviation shocks	10	11	12	12	12	12	**11**	9
B6. One-time 30 percent nominal depreciation relative to the baseline in 2015 5/	10	14	15	15	15	15	**15**	12
PV of debt-to-exports+remittances ratio								
Baseline	37	40	40	41	41	41	**38**	26
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2014-2034 1/	37	34	30	27	24	21	**8**	3
A2. New public sector loans on less favorable terms in 2014-2034 2/	37	42	43	46	48	49	**51**	43
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2015-2016	37	40	39	40	41	41	**37**	26
B2. Export value growth at historical average minus one standard deviation in 2015-2016 3/	37	39	44	45	45	45	**41**	28
B3. U.S. dollar GDP deflator at historical average minus one standard deviation in 2015-2016	37	40	39	40	41	41	**37**	26
B4. Net non-debt-creating flows at historical average minus one standard deviation in 2015-2016 4/	37	48	54	51	51	51	**43**	27
B5. Combination of B1-B4 using one-half standard deviation shocks	37	40	43	42	42	42	**38**	26
B6. One-time 30 percent nominal depreciation relative to the baseline in 2015 5/	37	40	39	40	41	41	**37**	26
PV of debt-to-revenue ratio								
Baseline	90	92	92	87	84	81	**76**	61
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2014-2034 1/	90	77	69	58	49	42	**16**	7
A2. New public sector loans on less favorable terms in 2014-2034 2/	90	95	100	98	97	97	**103**	102
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2015-2016	90	91	92	87	84	81	**76**	62
B2. Export value growth at historical average minus one standard deviation in 2015-2016 3/	90	89	98	92	88	85	**79**	62
B3. U.S. dollar GDP deflator at historical average minus one standard deviation in 2015-2016	90	94	98	93	89	87	**81**	66
B4. Net non-debt-creating flows at historical average minus one standard deviation in 2015-2016 4/	90	104	117	109	104	100	**88**	64
B5. Combination of B1-B4 using one-half standard deviation shocks	90	94	102	96	92	89	**82**	65
B6. One-time 30 percent nominal depreciation relative to the baseline in 2015 5/	90	127	128	121	116	113	**106**	86

(continued)

Table 3. Bangladesh: Sensitivity Analysis for Key Indicators of Public and Publicly Guaranteed External Debt, 2014-34 (concluded) (In percent)								
				Projections				
	2014	2015	2016	2017	2018	2019	**2024**	2034
Debt service-to-exports+remittances ratio								
Baseline	7	5	4	3	3	3	**4**	3
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2014-2034 1/	7	5	4	3	2	2	**2**	1
A2. New public sector loans on less favorable terms in 2014-2034 2/	7	5	4	3	3	3	**4**	4
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2015-2016	7	5	4	3	3	3	**4**	3
B2. Export value growth at historical average minus one standard deviation in 2015-2016 3/	7	5	4	3	3	3	**4**	3
B3. U.S. dollar GDP deflator at historical average minus one standard deviation in 2015-2016	7	5	4	3	3	3	**4**	3
B4. Net non-debt-creating flows at historical average minus one standard deviation in 2015-2016 4/	7	5	5	4	3	3	**4**	3
B5. Combination of B1-B4 using one-half standard deviation shocks	7	5	4	3	3	3	**4**	3
B6. One-time 30 percent nominal depreciation relative to the baseline in 2015 5/	7	5	4	3	3	3	**4**	3
Debt service-to-revenue ratio								
Baseline	16	12	10	7	6	6	**8**	7
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2014-2034 1/	16	12	9	6	5	5	**4**	2
A2. New public sector loans on less favorable terms in 2014-2034 2/	16	12	9	7	6	6	**8**	10
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2015-2016	16	12	10	7	6	6	**8**	7
B2. Export value growth at historical average minus one standard deviation in 2015-2016 3/	16	12	10	7	6	6	**8**	7
B3. U.S. dollar GDP deflator at historical average minus one standard deviation in 2015-2016	16	12	10	7	6	6	**8**	7
B4. Net non-debt-creating flows at historical average minus one standard deviation in 2015-2016 4/	16	12	10	8	7	7	**9**	8
B5. Combination of B1-B4 using one-half standard deviation shocks	16	12	10	7	6	6	**8**	7
B6. One-time 30 percent nominal depreciation relative to the baseline in 2015 5/	16	16	14	10	8	8	**11**	10
Memorandum item:								
Grant element assumed on residual financing (i.e., financing required above baseline) 6/	8	8	8	8	8	8	**8**	8

Sources: Bangladesh 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/ Export 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, 2011–34

(In percent of GDP, unless otherwise indicated)

	Actual		Estimate			Projections									
				Average 1/	Standard Deviation 1/							2014–19 Average			2020–34 Average
	2011	2012	2013			2014	2015	2016	2017	2018	2019		2024	2034	
Public sector debt 2/	44.2	42.6	39.3			38.7	38.8	38.2	37.3	36.0	34.9		32.1	29.8	
Of which: domestic borrowing by nonfinancial public enterprises	1.8	1.4	0.6			0.5	0.5	0.5	0.5	0.5	0.5		0.5	0.5	
Of which: foreign-currency denominated	21.4	20.6	18.3			17.2	17.5	17.4	17.3	17.2	17.0		15.4	11.8	
Of which: guarantee-supported external borrowing	...	...	0.1			0.6	1.1	1.6	2.0	2.3	2.7		3.8	5.7	
Change in public sector debt	1.3	-1.6	-3.3			-0.7	0.1	-0.6	-0.9	-1.2	-1.1		-0.4	0.0	
Identified debt-creating flows	-0.1	-0.5	-1.7			-0.4	0.2	-0.4	-0.9	-1.3	-1.3		-0.4	-0.1	
Primary deficit	2.2	1.1	1.6	1.4	0.5	1.5	1.5	1.1	0.6	0.2	0.1	0.8	0.4	0.5	0.3
Revenue and grants	11.9	12.9	12.9			13.2	13.4	13.5	14.3	15.0	15.5		15.4	15.2	
Of which: Grants	0.3	0.5	0.5			0.5	0.5	0.4	0.4	0.4	0.3		0.2	0.1	
Primary (noninterest) expenditure	14.1	14.1	14.5			14.6	14.8	14.6	15.0	15.1	15.5		15.8	15.7	
Automatic debt dynamics	-2.3	-1.7	-3.5			-2.4	-1.8	-2.0	-2.0	-1.9	-1.9		-1.3	-1.1	
Contribution from interest rate/growth differential	-2.6	-2.4	-1.7			-1.4	-1.8	-1.8	-1.9	-1.8	-1.7		-1.2	-0.9	
of which: Contribution from average real interest rate	0.1	0.2	0.7			0.6	0.6	0.5	0.6	0.6	0.7		0.8	0.9	
of which: Contribution from real GDP growth	-2.7	-2.6	-2.4			-2.1	-2.4	-2.4	-2.5	-2.4	-2.4		-2.0	-1.8	
Contribution from real exchange rate depreciation	0.2	0.7	-1.8			-1.0	0.0	-0.2	-0.1	-0.1	-0.2		...	...	
Other identified debt-creating flows	0.0	0.0	0.1			0.5	0.5	0.5	0.5	0.5	0.5		0.5	0.5	
Guarantee-supported external borrowing	0.0	0.0	0.1			0.5	0.5	0.5	0.5	0.5	0.5		0.5	0.5	
Residual, including asset changes	1.4	-1.1	-1.5			-0.3	-0.1	-0.3	0.0	0.1	0.2		0.0	0.1	
Other Sustainability Indicators															
PV of public sector debt	...	...	32.9			32.8	33.1	32.8	32.1	31.1	30.2		28.2	27.3	
Of which: Foreign-currency demoninated	...	...	11.9			11.3	11.8	12.0	12.2	12.3	12.3		11.5	9.2	
Of which: External	...	...	11.9			11.3	11.8	12.0	12.2	12.3	12.3		11.5	9.2	
PV of contingent liabilities (not included in public sector debt)	...	...	...			...	...	...	...	...	...		...	...	
Gross financing need 3/	6.3	6.4	7.3			6.9	5.8	4.9	3.8	3.0	2.9		3.3	3.3	
PV of public sector debt-to-revenue and grants ratio (in percent)	...	...	254.9			249.4	247.8	243.0	223.7	207.7	195.5		183.9	178.8	
PV of public sector debt-to-revenue ratio (in percent)	...	...	265.2			259.8	257.0	251.2	230.1	212.9	199.8		186.8	180.3	
Of which: External 4/	...	...	95.6			89.6	91.5	92.1	87.3	83.9	81.2		76.2	61.0	
Debt service-to-revenue and grants ratio (in percent) 5/	22.1	24.3	24.6			30.5	25.1	21.6	17.8	16.1	15.2		16.0	16.0	
Debt service-to-revenue ratio (in percent) 5/	22.6	25.3	25.6			31.7	26.0	22.3	18.3	16.5	15.5		16.2	16.1	
Primary deficit that stabilizes the debt-to-GDP ratio	0.9	2.7	4.9			2.1	1.3	1.8	1.6	1.4	1.2		0.8	0.5	
Key macroeconomic and fiscal assumptions															
Real GDP growth (in percent)	6.7	6.2	6.0	6.2	0.3	5.5	6.5	6.5	7.0	7.0	7.0	6.6	6.5	6.5	6.5
Average nominal interest rate on forex debt (in percent)	0.9	1.2	1.0	1.0	0.1	1.7	1.8	2.0	2.1	2.3	2.5	2.1	3.1	3.8	3.3
Average real interest rate on domestic debt (in percent)	1.7	1.7	4.2	3.3	1.2	2.9	2.9	2.7	3.0	3.0	3.0	2.9	4.1	4.1	4.0
Real exchange rate depreciation (in percent, + indicates depreciation)	1.2	3.7	-9.4	-1.0	5.4	-5.8	...	...	...	...	...	...	...	...	...
Inflation rate (GDP deflator, in percent)	7.5	8.5	6.6	6.6	1.5	7.6	6.7	5.9	5.6	5.6	5.6	6.2	4.5	4.5	4.6
Growth of real primary spending (deflated by GDP deflator, in percent)	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Grant element of new external borrowing (in percent) 6/	...	...	... ...		...	22.3	22.1	20.4	20.7	22.1	21.1	21.4	17.0	10.5	15.0

Sources: 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 refer to fiscal years. For example, 2014 refers to July 2013–June 2014.

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 starting in 2014 as a result of increasing nonconcessional borrowing including issuance of a sovereign bond.
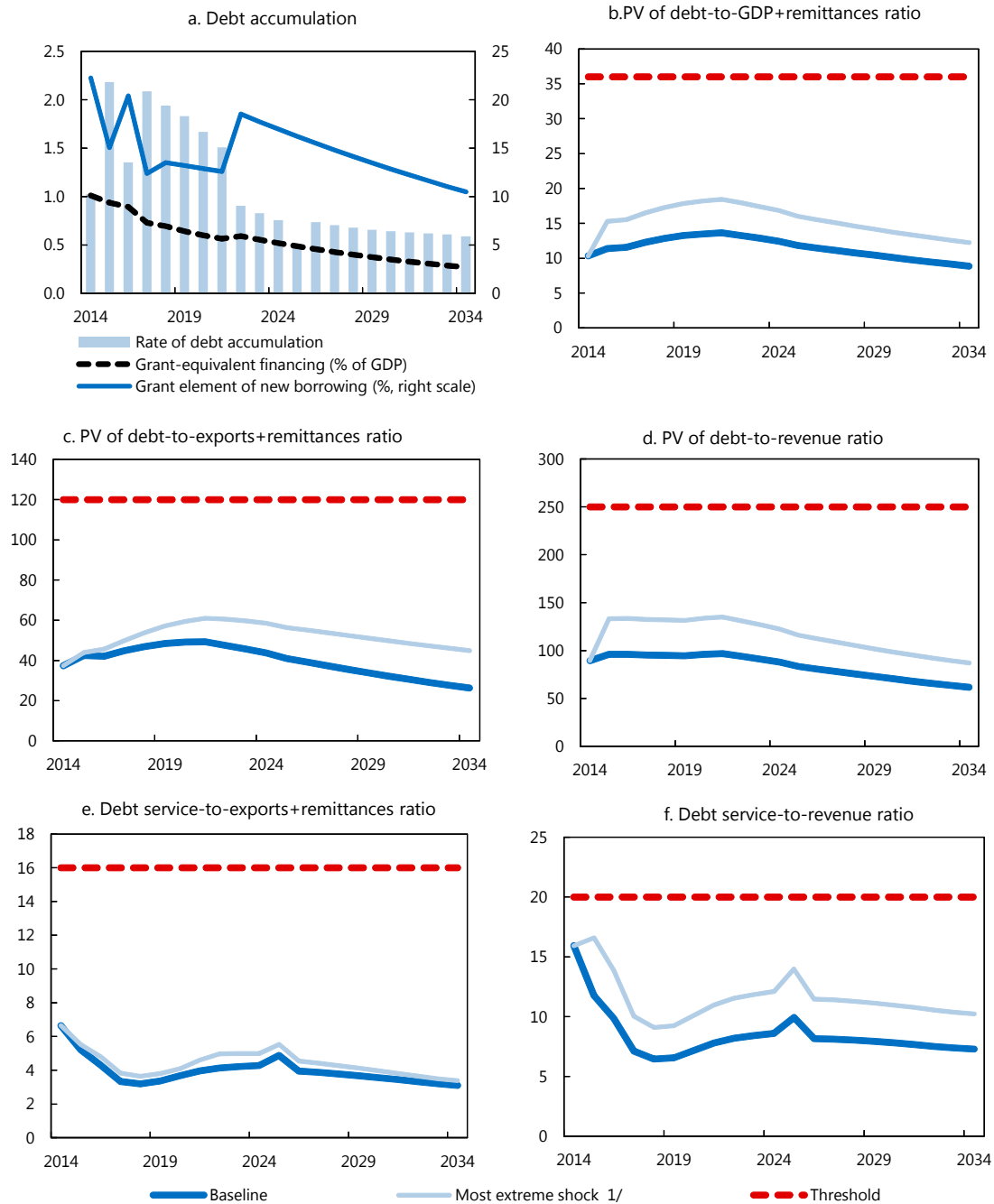
Table 5. Bangladesh: Sensitivity Analysis for Key Indicators of Public Debt 2014–34
(In percent)

				Projections				
	2014	2015	2016	2017	2018	2019	**2024**	2034
PV of Debt-to-GDP Ratio								
Baseline	33	33	33	32	31	30	**28**	27
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	33	33	33	33	34	34	**37**	42
A2. Primary balance is unchanged from 2014	33	33	33	33	33	34	**36**	41
A3. Permanently lower GDP growth 1/	33	33	33	32	31	30	**29**	29
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviation in 2015–2016	33	33	33	33	32	31	**30**	30
B2. Primary balance is at historical average minus one standard deviation in 2015–2016	33	34	34	33	32	31	**29**	28
B3. Combination of B1-B2 using one-half standard deviation shocks	33	33	34	33	32	31	**30**	29
B4. One-time 30 percent real depreciation in 2015	33	38	37	36	35	34	**32**	31
B5. 10 percent of GDP increase in other debt-creating flows in 2015	33	43	42	41	39	38	**35**	33
PV of Debt-to-Revenue Ratio 2/								
Baseline	249	248	243	224	208	196	**184**	179
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	249	248	246	233	226	222	**240**	277
A2. Primary balance is unchanged from 2014	249	248	245	231	223	218	**234**	268
A3. Permanently lower GDP growth 1/	249	248	243	224	209	197	**188**	190
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviation in 2015–2016	249	249	247	228	213	201	**194**	194
B2. Primary balance is at historical average minus one standard deviation in 2015–2016	249	251	252	231	215	202	**189**	182
B3. Combination of B1-B2 using one-half standard deviation shocks	249	250	250	231	215	203	**193**	191
B4. One-time 30 percent real depreciation in 2015	249	284	276	253	234	220	**207**	206
B5. 10 percent of GDP increase in other debt-creating flows in 2015	249	319	310	283	263	247	**228**	217
Debt Service-to-Revenue Ratio 2/								
Baseline	30	25	22	18	16	15	**16**	16
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	30	25	22	18	17	18	**22**	27
A2. Primary balance is unchanged from 2014	30	25	22	18	17	17	**21**	26
A3. Permanently lower GDP growth 1/	30	25	22	18	16	15	**16**	17
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviation in 2015–2016	30	25	22	18	17	16	**17**	18
B2. Primary balance is at historical average minus one standard deviation in 2015–2016	30	25	22	19	18	16	**16**	17
B3. Combination of B1-B2 using one-half standard deviation shocks	30	25	22	19	17	16	**17**	17
B4. One-time 30 percent real depreciation in 2015	30	28	26	22	20	19	**22**	23
B5. 10 percent of GDP increase in other debt-creating flows in 2015	30	25	27	36	24	23	**21**	24

Sources: 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 I — Indicators of Public and Publicly Guaranteed External Debt under Different Assumptions, 2014–34 1/
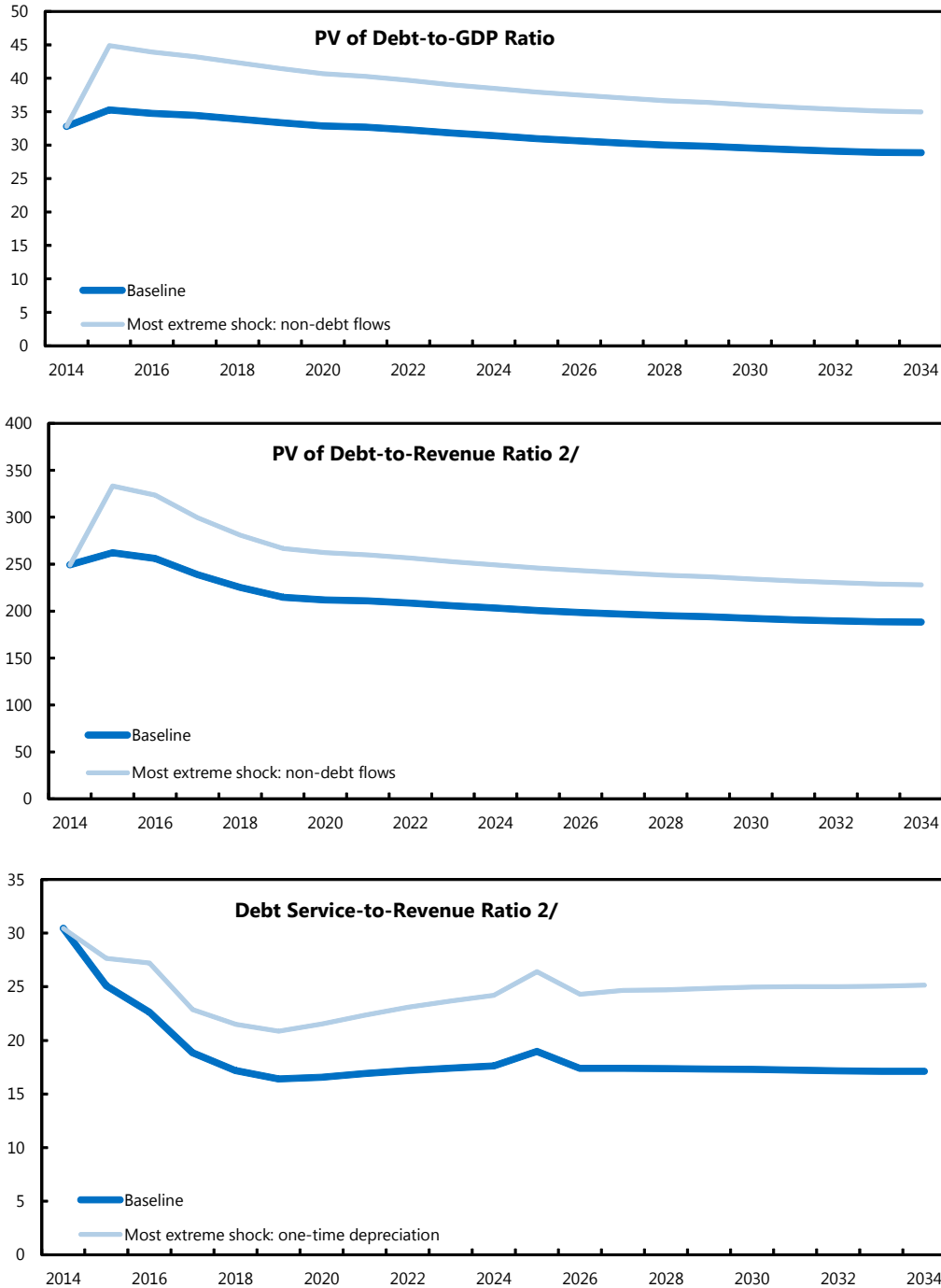
(In percent)

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   Most extreme shock 1/   Threshold

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

1/ The most extreme stress test is the test that yields the highest ratio in 2024. 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 4. Bangladesh: Alternative Scenario I — Indicators of Public Debt under Different Assumptions, 2014–34 1/

(In percent)

PV of Debt-to-GDP Ratio

Baseline

Most extreme shock: non-debt flows

PV of Debt-to-Revenue Ratio 2/

Baseline

Most extreme shock: non-debt flows

Debt Service-to-Revenue Ratio 2/

Baseline
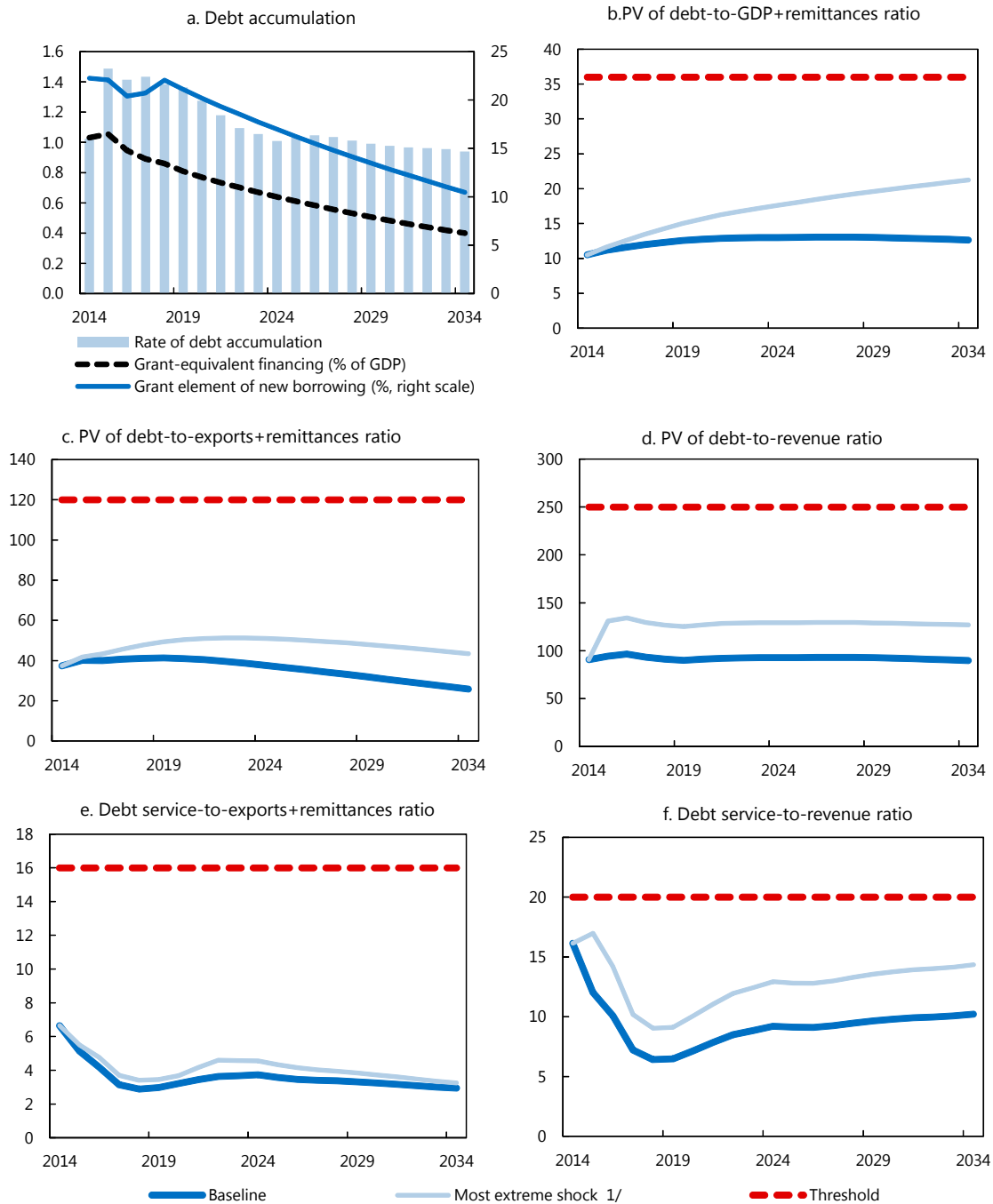
Most extreme shock: one-time depreciation

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

1/ The most extreme stress test is the test that yields the highest ratio in 2024.

2/ Revenues are defined inclusive of grants.

Figure 5. Bangladesh: Alternative Scenario II — Indicators of Public and Publicly Guaranteed External Debt under Different Assumptions, 2014–34 1/
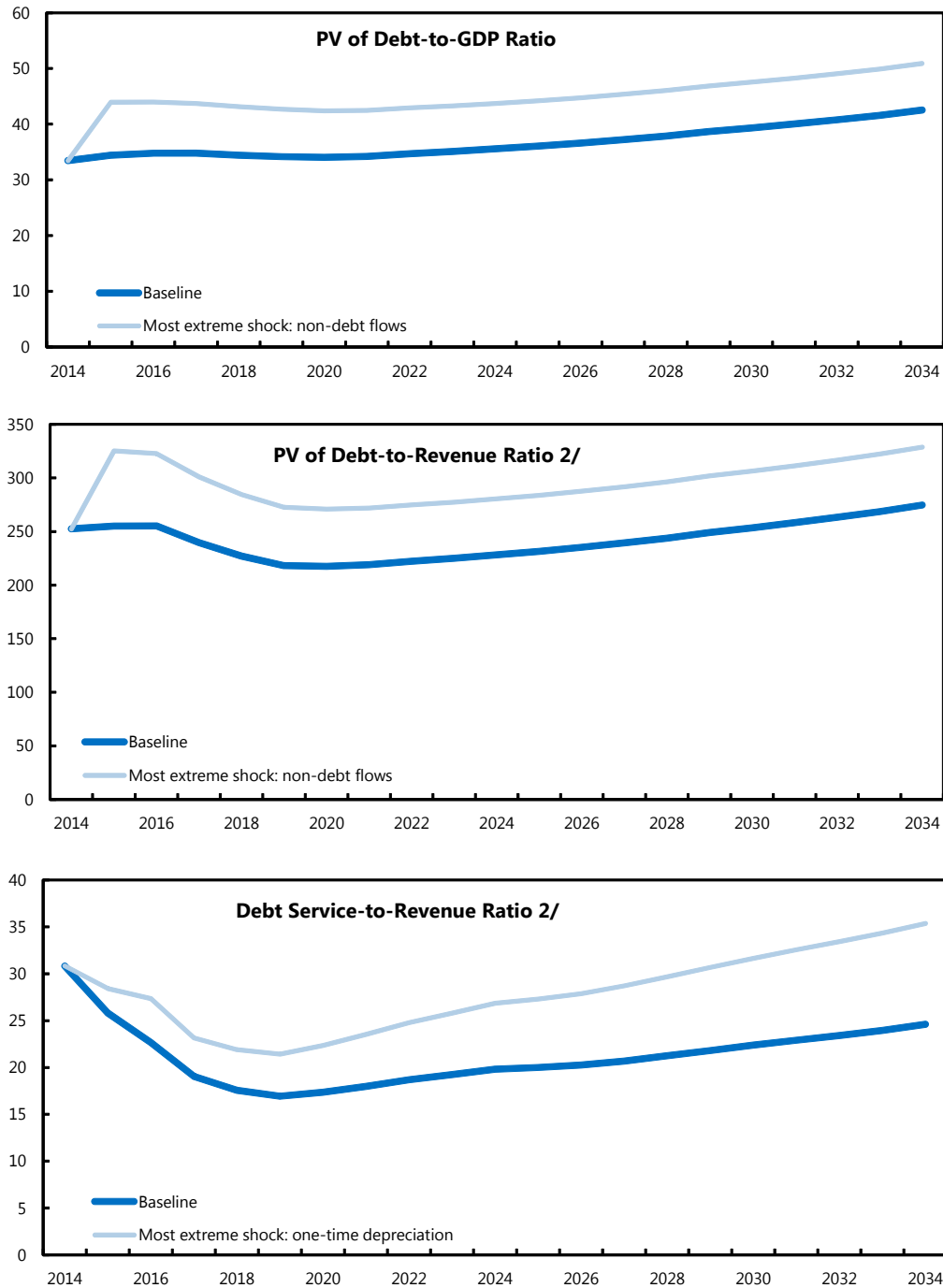
(In percent)

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   Most extreme shock 1/   Threshold

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

1/ The most extreme stress test is the test that yields the highest ratio in 2024. 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 non-debt flows shock and in figure f. to a one-time depreciation shock.

Figure 6. Bangladesh: Alternative Scenario II — Indicators of Public Debt under Different Assumptions, 2014–34 1/

(In percent)

PV of Debt-to-GDP Ratio

Baseline

Most extreme shock: non-debt flows

PV of Debt-to-Revenue Ratio 2/

Baseline

Most extreme shock: non-debt flows

Debt Service-to-Revenue Ratio 2/

Baseline

Most extreme shock: one-time depreciation

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

1/ The most extreme stress test is the test that yields the highest ratio in 2024.

2/ Revenues are defined inclusive of grants.