INTERNATIONAL MONETARY FUND
INTERNATIONAL DEVELOPMENT ASSOCIATION

BANGLADESH

Joint IMF/World Bank Debt Sustainability Analysis 2009[1]

Prepared by the Staffs of the International Monetary Fund and
the International Development Association

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Bangladesh's risk of debt distress is low based on external debt indicators. *Bangladesh's external debt burden indicators do not breach the relevant policy-dependent indicative thresholds under the baseline scenario and also do not breach the thresholds under the stress tests[2]. Debt burden indicators are significantly worse when domestic debt is included. Accordingly, this analysis reveals a more elevated risk of debt distress on public debt compared to results based solely on external debt. Staffs will continue to monitor closely the evolution of domestic debt and the government's ability to mobilize domestic resources, especially tax revenues.*

1. **The results of this DSA are similar to those of the previous DSA.**[3] The primary difference between the two is that, whereas in the previous DSA one of the thresholds was

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[1] This DSA has been prepared jointly by World Bank and IMF staffs and in consultation with the Asian Development Bank using the debt sustainability framework for low-income countries approved by the Boards of both institutions. The DSA is based on macroeconomic data gathered in the context of IMF missions to Dhaka in 2009. Estimated debt outstanding and disbursed as of end–FY2009 provides the basis for the debt figures. The starting point for the previous DSA was estimated debt outstanding and disbursed as of end–FY2007.

[2] The low-income country debt sustainability framework (LIC DSF) recognizes that better policies and institutions allow countries to manage higher levels of debt, and thus the threshold levels are policy-dependent. Bangladesh's policies and institutions, as measured by the World Bank's Country Policy and Institutional Assessment (CPIA), place it as a "medium performer." The relevant indicative thresholds for this category are: 40 percent for the NPV of debt-to-GDP ratio, 150 percent for the NPV of debt-to-exports ratio, 250 percent for the NPV of debt-to-revenue ratio, 20 percent for the debt service-to-exports ratio, and 30 percent for the debt service-to-revenue ratio. These thresholds are applicable to public and publicly guaranteed external debt.

[3] IMF Country Report No. 08/334 (Annex I).

marginally breached in the most extreme stress test, this is not the case in the current DSA.[4] The projections of the external debt to GDP ratio in the previous DSA were, by and large, accurate as the outturns for FY2008 and FY2009 deviated only marginally from the projections. Compared to the previous DSA, the baseline assumptions for economic growth are more conservative, the projected rate of external debt accumulation is somewhat lower and, reflecting lower global interest rates, the discount rate is reduced from 5 percent to 4 percent.[5] Longer-term debt dynamics are adversely affected by the lower growth assumptions but positively affected by the lower projected rate of debt accumulation. The lower discount rate raises the net present value of external debt across the board.

2. **Box 1 summarizes the medium-term macroeconomic framework underlying the DSA**. Most notably, it is based on projections for growth that are in line with the average growth rate over the past ten years and somewhat lower than those in Bangladesh's own medium-term framework.

I. External Debt Sustainability Analysis

3. **All external debt indicators remain well below the policy-dependent debt burden thresholds under the baseline scenario, and no thresholds are breached under standardized stress test.[6]** Bangladesh's external debt was equivalent to 24 percent of GDP at the end of FY2009, down from 27 percent of GDP at the end of FY2007. The declining trend in the external debt to GDP ratio reflects prudent borrowing and strong economic growth. The main results of the external DSA are as follows:

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[4] The relative magnitude of the most extreme shock in last year's DSA (the combination of one-half standard deviation shock to net transfers, export growth, GDP growth, and the GDP deflator) is now smaller than in last year's DSA because the historical averages of the macroeconomic variables are somewhat higher and the standard deviations are somewhat lower for the period 2000-2009 used in this DSA than for the period 1998-2007 used in the previous DSA. For instance, the 10-year average of the growth of exports of goods and services is now 11.5 percent, up from 11.0 in the previous DSA, and the standard deviation is now 7.2 percent, down from 7.7 percent in the previous DSA. Since the values of the key variables under the shock are simulated to be the historical average subtracted of half a standard deviation, exports of goods and services are now somewhat higher vis-à-vis the baseline compared to the analysis done in the previous DSA.

[5] The discount rate was reduced by a full percentage point after the six-month average U.S. dollar commercial interest reference rate fell below the earlier 5 percent discount rate by more than a full percentage point for a period of six months (see staff guidance note http://www.imf.org/external/np/pp/eng/2008/070308.pdf).

[6] Private sector external debt remains very small. Capital controls generally impede borrowing from abroad. And while industrial projects in Bangladesh can access medium and long-term external borrowing with prior BOI approval, the absence of a sovereign credit rating raises the country risk premium, making external borrowing relatively expensive.

Box 1. Bangladesh: Macroeconomic Assumptions Underlying the DSA

Real GDP growth in the medium term is projected at 6 percent, slightly above the 10-year average of 5.8 percent. It is assumed to average 6¼ percent in the long run. This is lower than in Bangladesh's own medium-term framework, reflecting the fact that the government which came to power in January 2009 is still in the process of articulating an agenda of growth-enhancing structural reforms.

Inflation, as measured by the GDP deflator in domestic currency, decelerates from 6.4 percent in FY09 to 4.5 percent in FY14, reflecting declining import prices and moderating demand pressures.

The growth of **exports** and **imports** of goods and services is strong in the medium term (12½ percent and 12 percent, respectively). As the economy continues to become more open, exports and imports both will increase in terms of GDP. **Remittances** are projected to increase by 9 percent per annum.

The **current account** (including grants) continues to show a surplus as remittances continue to offset the merchandise trade deficit. Deeper macroeconomic and structural reforms, which are not envisaged in this baseline, would boost imports further and push the current account to a deficit. Such reforms would trigger larger FDI inflows and donor support which would finance part of the higher imports.

Net aid inflows (disbursements of grants and loans net of amortization payments) amount to about 1.3 percent of GDP in the medium and long term. The strong balance of payments, limited momentum for structural reforms, and slow implementation of existing donor-supported projects are holding back the disbursement of project and program loans. And amortization payments are edging up over time (they will amount to about US$720 million in FY2010 and rise to US$850 million in FY14, up from US$580 million in FY08). The larger net aid inflows in FY08 (1.9 percent of GDP) was in response to the two cyclones that hit Bangladesh that year. The net aid inflow in FY2010 (1.5 percent of GDP) is also expected to exceed the longer-term average because of the large budget support from the ADB (¾ percent of GDP) in response to the global recession.

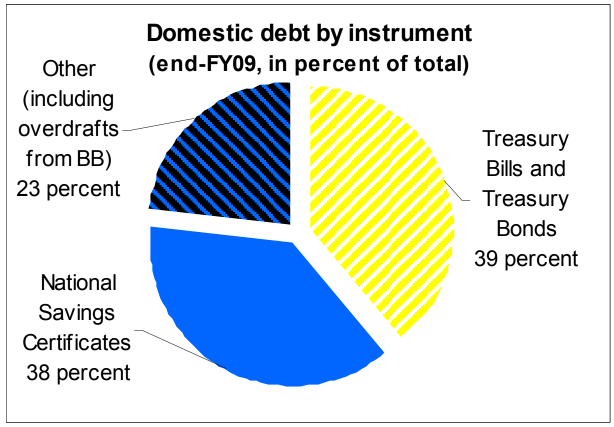
The **grant element of new external borrowing** is assumed to remain at about 30 percent.

The **primary fiscal deficit** (including grants) is assumed to average 1 percent of GDP over the medium term, about 0.4 percent of GDP smaller than the average of the past 10 years. Domestic revenue is projected to remain below 11 percent of GDP over the medium-term.

Real interest rates on domestic currency government debt are assumed to average about 6 percent in the medium term, and decline gradually as financial markets develop.

- **All debt indicators in the baseline scenario are expected to decline over the 20-year projection period** (Table 1 and Figure 1). The NPV of external debt-to-GDP ratio decreases from about 20 percent in 2009 to less than 10 percent (compared to an indicative threshold of 40 percent) during the projection period, while the NPV of external debt-to-exports ratio decreases from 99 percent in 2009 to 25 percent (compared to an indicative threshold of 150 percent), and the debt service ratio decreases from 6 percent in 2010 to 2½ percent (compared to an indicative threshold of 20 percent).

- **The standard stress tests do not reveal serious vulnerabilities**[7] although the NPV of debt to revenues threshold is almost breached in the most extreme test, in which net non-debt creating flows (e.g. official transfers, remittances, and FDI) are at their historical average minus one standard deviation in 2011-12 (Table 2, Figure 1). The strong increase in remittances in Bangladesh in recent years, from about 8 percent of GDP in FY06 to almost 11 percent of GDP in FY09, has improved the capacity to repay beyond what is recognized in the DSA framework—which only uses GDP, exports, and government revenues as proxies for countries' capacity to repay.[8] The increase in remittances—a relatively stable source of foreign inflows—has reduced vulnerabilities.



II. Public Debt Sustainability Analysis[9]

4. **Domestic debt has been rising modestly in recent years, from 20 percent of GDP in FY06 and FY07 to 21.2 percent of GDP n FY09.** Close to 40 percent of the domestic debt is in the form of treasury bills and treasury bonds, held mostly by domestic commercial banks. National savings certificates, mostly held by the nonbank private sector, constitute another large share of the domestic debt (38 percent). Bangladesh Bank holds more than 20 percent of the government's domestic debt, in the form of nontradable overdrafts and a small amount of devolved treasury bills and bonds (0.6 percent of GDP at end-FY09).[10]

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[7] Debt and debt burden indicators in the "historical scenario" in Figure 1 and Figure 2 are less favorable than in the baseline. The historical scenario puts key variables such as real GDP growth and the non-interest current account in percent of GDP during 2010-2030 at their historical averages recorded during 2000-2009. The baseline scenario builds on the recent favorable developments in remittances and exports of textiles and garments. If these assumptions are replaced, in the historical scenario, by the somewhat less favorable numbers realized during 2000-09, then the debt and debt burden indicators develop less favorably.

[8] A recent review of some aspects of the Low-Income Country Debt Sustainability Framework recommended greater recognition of remittances in DSAs for countries where they are large, including in the determination of risk ratings (see http://www.imf.org/external/pp/longres.aspx?id=4358).

[9] Public debt includes domestic central government debt and external public and publicly guaranteed debt.

[10] It should be noted that the government of Bangladesh maintains large and growing deposit balances with commercial banks. According to the monetary survey, these balances amounted to Tk 183 billion or 3 percent of GDP at the end of FY2009, up from Tk 122 billion or 2.6 percent of GDP at the end of FY2007. Therefore, net domestic government debt was about 18.2 percent of GDP at the end of FY2009. The substantial government deposits reflect inefficiencies in budget and cash management. They are mostly held by autonomous and semi-autonomous government bodies. Because the deposits are largely outside the control of the central government, the public debt sustainability analysis does not take them into account and focuses on the gross public debt.

5. **In the baseline scenario, the NPV of public debt-to-GDP ratio remains steady at about 40 percent of GDP.** The decline in the NPV of external public debt to GDP ratio is offset by a rising domestic debt-to-GDP ratio. The NPV of total public debt remains at 40 percent of GDP through FY2015 and declines to 37 percent of GDP in FY2030. The NPV of public debt-to-domestic revenue ratio follows a similar trend, remaining broadly steady between FY2010 and FY2015 and gradually declining in the long run.

6. **The alternative scenarios and bound tests indicate that the projected paths of debt indicators are sensitive to alternative assumptions and point to sizeable risks** (Table 4). Subsidies to loss-making state-owned enterprises have for the most part been brought onto the budget. This has reduced fiscal risks. However, energy (e.g. electricity and diesel) and imported fertilizer remain underpriced and a further rise in world market prices could create contingent liabilities of the government to state-owned enterprises as no mechanisms exist to automatically adjust domestic retail prices to reflect higher import costs. Under the assumption of a one-off debt creating flow of 10 percent of GDP—to securitize the contingent liabilities, as was done in FY08 at a smaller scale to regularize BPC's debts to state-owned commercial banks—the debt service to revenue ratio reaches 36 percent in FY2015, compared with the baseline ratio of 28 percent.

7. **It should be noted that the baseline assumes continued under-implementation of the government's Annual Development Program (ADP)**.[11] Full implementation of the ADP in FY2010, while desirable to boost long-term growth, could raise the overall fiscal deficit by more than one percent of GDP. The bulk of the ADP is typically financed by concessional external financing. Therefore, full implementation of the ADP would likely entail additional concessional external financing—over and above what is assumed in the baseline scenario. To the extent that the higher ADP spending would be financed through the issuance of additional domestic debt, some of which carries interest rates of 12 percent, this would put key public debt and public debt service ratios on higher and possibly rising paths over the medium term.

III. DEBT MANAGEMENT

8. **In response to a request from the authorities, a joint Bank/Fund mission visited Bangladesh in November 2009 to provide technical assistance in developing a reform plan for improving debt management functions and operations.** The mission built on the findings of previous work done by the Bank and the Fund in Bangladesh, which included assessing strengths and weaknesses in debt management performance and capacity and designing a medium-term debt management strategy (MTDS).[12]

[11] During the past five fiscal years, successive governments on average managed to implement 73 percent of the amount included in the original budget for ADP spending. In FY09, ADP spending fell short of the original budget by 1 percentage point of GDP.

[12] There was a joint Bank-Fund mission to develop a MTDS (January 2008), followed by a Bank mission to apply the Debt Management Performance Assessment (DeMPA) tool (February 2008).

9. **The November 2009 mission focused recommendations on several key areas where procedural and capacity issues have been identified**, including (i) improving institutional arrangements for managing total public sector debt, with a view also to better integrate domestic debt in the debt recording system; (ii) developing capacity and procedures for improved cash balance management and cash-flow forecasting; and (iii) reducing operational risks, given deficiencies with regard to the recording and reconciliation of data.

IV. CONCLUSION

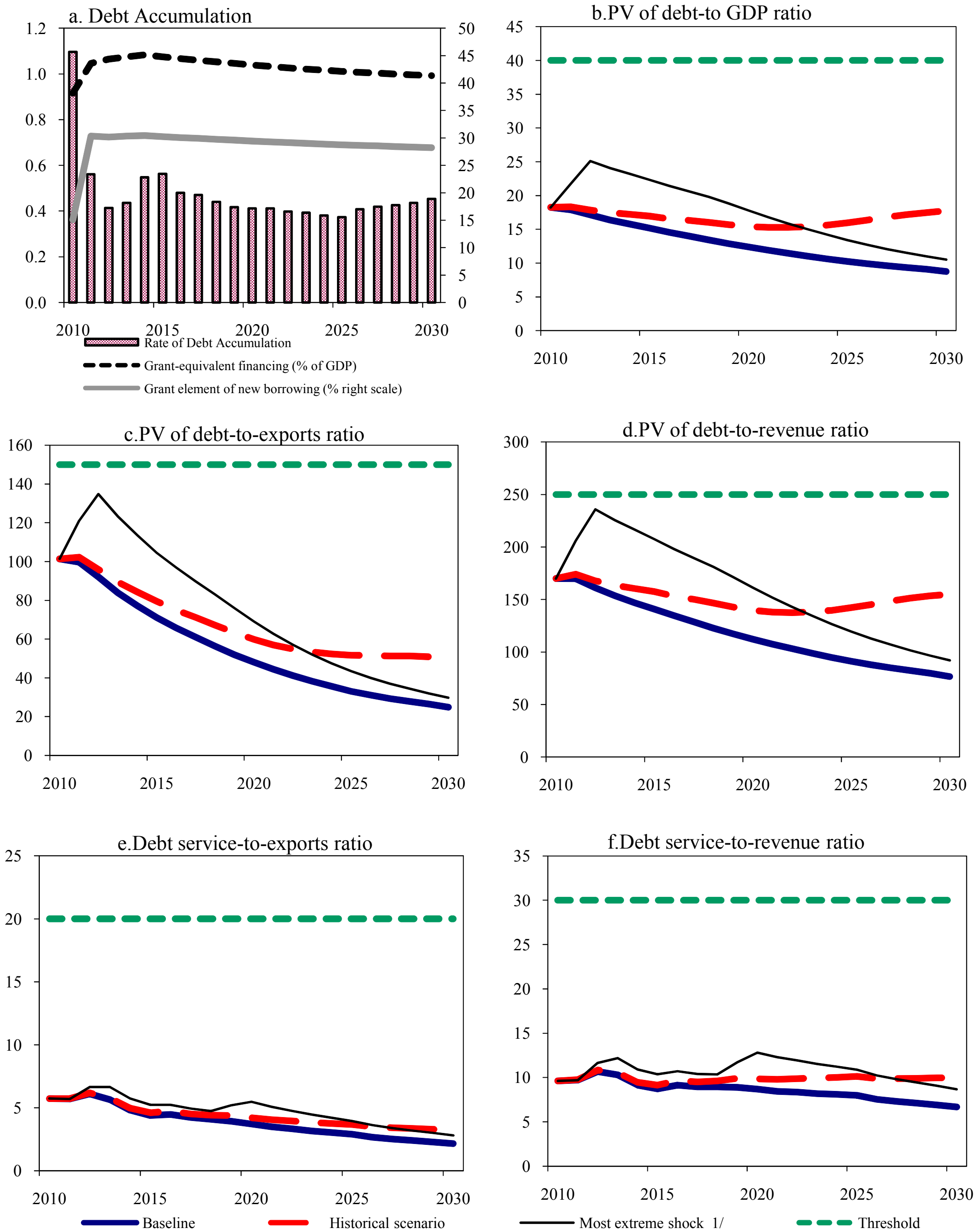
10. **In the staffs' view, Bangladesh should be considered at low risk of debt distress based on external indicators, but the analysis reveals a more elevated risk of debt distress on public debt.** The baseline projections and the associated standard stress tests show little risk related to external debt given that none of the indicators breaches the indicative debt burden thresholds. However, in view of Bangladesh's continued low domestic revenue base, risks to domestic debt accumulation raise concerns.

11. **The substantial increase in debt ratios when domestic debt is included calls for careful management of the public debt.** While the NPV of public debt-to-revenue ratio would decline over the 20-year horizon under the baseline assumptions, the ratio would remain high over the medium term and rises in some of the alternative scenarios and bound tests.

12. **Efforts to mobilize domestic revenues, as well as the appropriate management of contingent liabilities, and continued prudent management of expenditures while protecting priority spending are the keys to ensure improvement in the debt indicators**. This exercise also underscores the importance of effective management of the existing debt and new debt accumulation.

13. **The staff encourages the authorities to build on recent steps and move forward as quickly as possible to strengthen debt management capacity.** In this regard, it will be important to continue the work underway to develop a comprehensive public debt data base which covers both domestic and external debt and to integrate it with centralized reporting of all external aid flows.

Figure 1. Bangladesh: Indicators of Public and Publicly Guaranteed External Debt under Alternative Scenarios, 2010-2030 1/ 2/

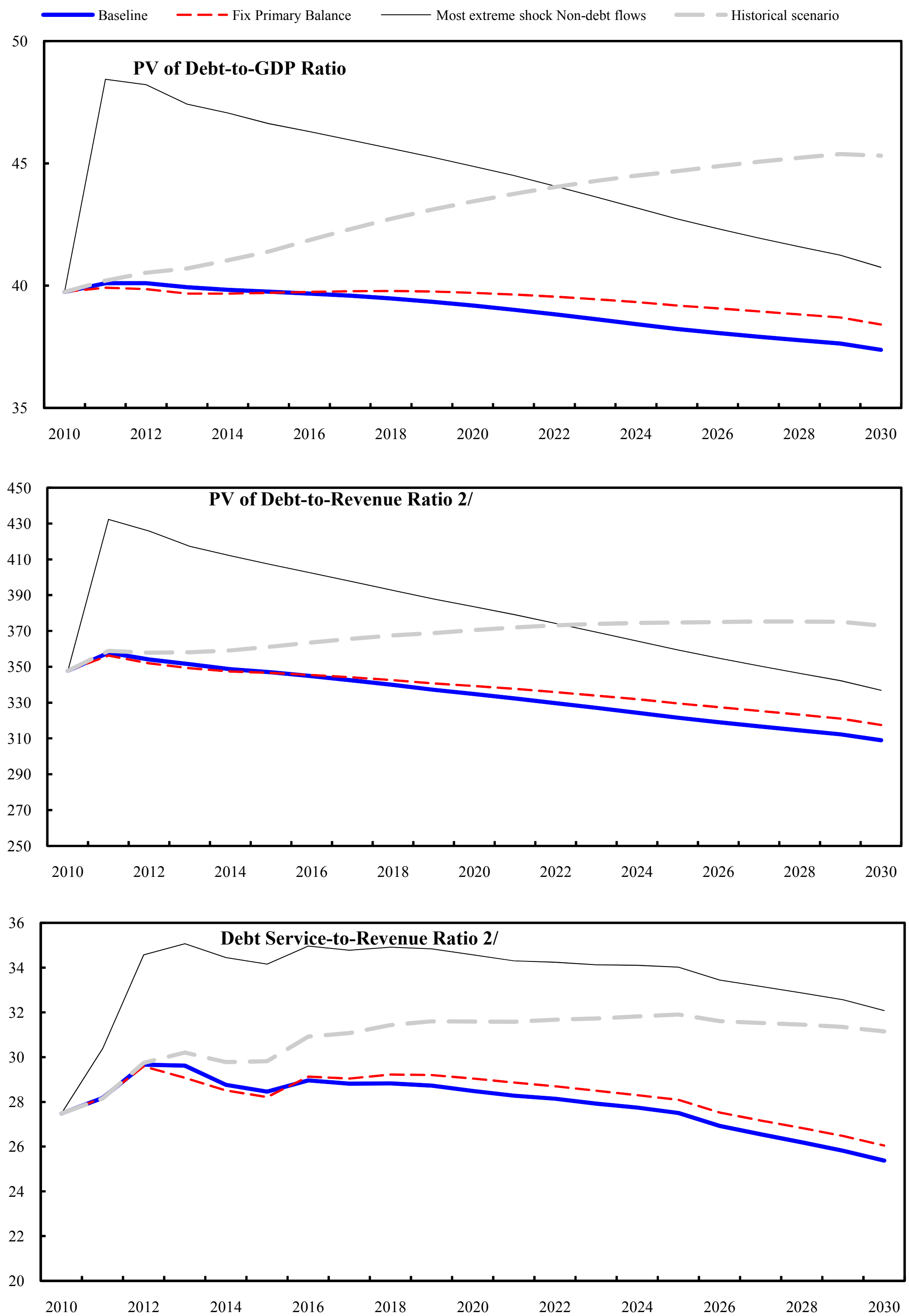


Sources: Country authorities; and staff estimates and projections.

1/ The most extreme stress test is the test that yields the highest ratio in 2020. In figure b. it corresponds to a Non-debt flows shock; in c. to a Non-debt flows shock; in d. to a Non-debt flows shock; in e. to a Non-debt flows shock and in figure f. to a Non-debt flows shock

2/ The large rate of debt accumulation in FY2010 compared to later years reflects large program loans from the AsDB (almost 0.8 percent of GDP) to help bangladesh weather the global crisis. The bulk of these loans were disbursed in November 2009.

Figure 2.Bangladesh: Indicators of Public Debt Under Alternative Scenarios, 2010-2030 1/



Sources: Country authorities; and staff estimates and projections.
1/ The most extreme stress test is the test that yields the highest ratio in 2020.
2/ Revenues are defined inclusive of grants.

Table 1.Bangladesh: External Debt Sustainability Framework, Baseline Scenario, 2007-2030 1/
(In percent of GDP, unless otherwise indicated)

	Actual			Historical 0 Average 0	Standard Deviation	Projections									
	2007	2008	2009			2010	2011	2012	2013	2014	2015	2010-2015 Average	2020	2030	2016-2030 Average
External debt (nominal) 1/	**27.3**	**26.6**	**24.3**			**22.6**	**22.0**	**21.0**	**20.1**	**19.3**	**18.6**		**15.5**	**12.0**	
o/w public and publicly guaranteed (PPG)	27.0	26.4	24.1			22.3	21.7	20.8	19.8	19.0	18.2		15.0	11.4	
Change in external debt	-1.7	-0.6	-2.3			-1.8	-0.6	-0.9	-1.0	-0.8	-0.7		-0.5	-0.4	
Identified net debt-creating flows	-4.6	-5.5	-6.8			-4.7	-3.3	-2.8	-2.7	-2.7	-2.6		-2.5	-3.0	
Non-interest current account deficit	**-1.0**	**-1.0**	**-3.1**	**-0.7**	**1.3**	**-3.2**	**-1.7**	**-1.1**	**-1.1**	**-1.1**	**-1.0**	-1.5	**-0.9**	**-1.1**	-1.2
Deficit in balance of goods and services	7.2	8.8	7.1			6.9	7.9	8.3	8.5	8.6	8.9		9.7	10.9	
Exports	20.3	20.1	19.5			18.0	17.9	18.6	19.5	20.4	21.3		25.8	35.3	
Imports	27.4	28.9	26.6			24.9	25.8	27.0	28.0	29.1	30.2		35.4	46.2	
Net current transfers (negative = inflow)	-9.3	-10.9	-11.4	-7.6	2.3	-11.1	-10.6	-10.5	-10.7	-10.8	-10.9	-10.8	-11.6	-13.2	-12.1
o/w official	-0.1	-0.2	-0.1			-0.1	-0.1	-0.1	-0.1	-0.1	-0.1		-0.1	0.0	
Other current account flows (negative = net inflow)	1.1	1.1	1.3			1.1	1.1	1.1	1.1	1.1	1.1		1.1	1.1	
Net FDI (negative = inflow)	**-1.0**	**-0.9**	**-1.1**	**-0.8**	**0.3**	**-0.7**	**-0.7**	**-0.7**	**-0.7**	**-0.8**	**-0.8**	-0.7	**-0.9**	**-1.4**	-1.1
Endogenous debt dynamics 2/	**-2.5**	**-3.6**	**-2.7**			**-0.8**	**-0.9**	**-0.9**	**-0.9**	**-0.8**	**-0.8**		**-0.7**	**-0.5**	
Contribution from nominal interest rate	0.2	0.3	0.2			0.3	0.3	0.3	0.3	0.3	0.3		0.3	0.3	
Contribution from real GDP growth	-1.7	-1.5	-1.4			-1.1	-1.2	-1.2	-1.2	-1.1	-1.1		-0.9	-0.7	
Contribution from price and exchange rate changes	-1.1	-2.4	-1.5			…	…	…	…	…	…		…	…	
Residual (3-4) 3/	**2.9**	**4.8**	**4.5**			**2.9**	**2.7**	**1.8**	**1.7**	**1.9**	**1.8**		**1.9**	**2.6**	
o/w 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/	...	...	19.5			18.5	18.1	17.4	16.7	16.1	15.5		12.9	9.4	
In percent of exports	...	...	100.1			102.6	101.1	93.5	85.3	78.7	72.7		50.0	26.7	
PV of PPG external debt	**...**	**...**	**19.3**			**18.2**	**17.9**	**17.2**	**16.4**	**15.8**	**15.2**		**12.4**	**8.8**	
In percent of exports	**...**	**...**	**99.0**			**101.4**	**99.7**	**92.1**	**83.9**	**77.1**	**71.0**		**48.1**	**24.9**	
In percent of government revenues	**...**	**...**	**185.3**			**169.9**	**169.7**	**161.3**	**153.5**	**146.9**	**140.9**		**112.2**	**76.7**	
Debt service-to-exports ratio (in percent)	**5.2**	**4.9**	**4.5**			**6.0**	**6.0**	**6.4**	**6.0**	**5.2**	**4.8**		**4.2**	**2.3**	
PPG debt service-to-exports ratio (in percent)	**4.9**	**4.7**	**4.2**			**5.7**	**5.7**	**6.1**	**5.6**	**4.8**	**4.4**		**3.7**	**2.2**	
PPG debt service-to-revenue ratio (in percent)	**9.8**	**8.6**	**7.9**			**9.6**	**9.7**	**10.7**	**10.3**	**9.2**	**8.7**		**8.7**	**6.7**	
Total gross financing need (Billions of U.S. dollars)	-0.7	-0.7	-2.9			-2.8	-1.4	-0.7	-0.8	-1.0	-1.0		-1.4	-6.7	
Non-interest current account deficit that stabilizes debt ratio	0.7	-0.4	-0.7			-1.4	-1.1	-0.2	-0.1	-0.3	-0.3		-0.3	-0.7	
Key macroeconomic assumptions															
Real GDP growth (in percent)	6.4	6.2	5.9	5.8	0.7	5.0	5.8	6.0	6.0	6.0	6.0	5.8	6.3	6.3	6.3
GDP deflator in US dollar terms (change in percent)	3.9	9.5	6.1	1.2	4.8	6.0	1.9	0.2	1.1	1.1	1.6	2.0	1.1	1.1	1.1
Effective interest rate (percent) 5/	0.9	1.1	0.9	1.1	0.1	1.3	1.4	1.4	1.5	1.6	1.6	1.5	1.9	2.2	2.0
Growth of exports of G&S (US dollar terms, in percent)	18.0	15.2	9.0	11.5	7.2	2.9	7.3	10.3	12.4	12.2	12.5	9.6	11.7	10.3	11.2
Growth of imports of G&S (US dollar terms, in percent)	19.8	22.4	3.4	11.2	9.6	4.2	11.7	11.0	11.5	11.2	11.8	10.2	10.9	10.4	10.6
Grant element of new public sector borrowing (in percent)	...	...	...	...	...	15.1	30.3	30.1	30.3	30.4	30.3	27.8	29.4	28.2	29.1
Government revenues (excluding grants, in percent of GDP)	10.2	10.8	10.4			10.7	10.5	10.6	10.7	10.7	10.8		11.0	11.4	11.1
Aid flows (in Billions of US dollars) 7/	0.7	0.5	0.9			0.9	1.4	1.5	1.6	1.8	1.9		2.6	5.0	
o/w Grants	0.4	0.4	0.6			0.7	0.7	0.8	0.8	0.9	1.0		1.4	2.7	
o/w Concessional loans	0.3	0.2	0.2			0.2	0.7	0.7	0.8	0.9	0.9		1.2	2.3	
Grant-equivalent financing (in percent of GDP) 8/	...	...	...			0.9	1.0	1.1	1.1	1.1	1.1		1.0	1.0	1.0
Grant-equivalent financing (in percent of external financing) 8/	...	...	...			41.5	54.7	54.9	54.8	54.7	54.7		54.4	53.8	54.2
Memorandum items:															
Nominal GDP (Billions of US dollars)	68.4	79.6	89.4			99.5	107.2	113.9	122.0	130.8	140.9		202.1	416.0	
Nominal dollar GDP growth	10.5	16.3	12.3			11.3	7.8	6.2	7.2	7.2	7.7	**7.9**	7.5	7.5	7.5
PV of PPG external debt (in Billions of US dollars)			17.2			18.2	18.7	19.2	19.7	20.3	21.1		24.7	36.5	
(PVt-PVt-1)/GDPt-1 (in percent)						1.1	0.6	0.4	0.4	0.5	0.6	0.6	0.4	0.5	0.4

Sources: Country authorities; and staff estimates and projections.

1/ Includes both public and private sector external debt. The years in the table refer to fiscal years. Therefore, 2009 refers to July 2008-June 2009.

2/ Derived as [r - g - ρ(1+g)]/(1+g+ρ+gρ) times previous period debt ratio, with r = nominal interest rate; g = real GDP growth rate, and ρ = growth rate of GDP deflator in U.S. dollar terms.

3/ Includes exceptional financing (i.e., changes in arrears and debt relief); changes in gross foreign assets; and valuation adjustments. For projections also includes contribution from price and exchange rate changes.

4/ Assumes that PV of private sector debt is equivalent to its face value.

5/ Current-year interest payments divided by previous period debt stock.

6/ Historical averages and standard deviations are generally derived over the past 10 years, subject to data availability.

7/ Defined as grants, concessional loans, and debt relief.

8/ Grant-equivalent financing includes grants provided directly to the government and through new borrowing (difference between the face value and the PV of new debt).

Table 2.Bangladesh: Sensitivity Analysis for Key Indicators of Public and Publicly Guaranteed External Debt, 2010-2030
(In percent)

	Projections							
	2010	2011	2012	2013	2014	2015	2020	2030
PV of debt-to GDP ratio								
Baseline	18	18	17	16	16	15	12	9
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2010-2030 1/	18	18	18	17	17	17	15	18
A2. New public sector loans on less favorable terms in 2010-2030 2	18	18	18	17	17	17	15	14
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2011-2012	18	18	17	16	16	15	12	9
B2. Export value growth at historical average minus one standard deviation in 2011-2012 3/	18	18	18	18	17	16	13	9
B3. US dollar GDP deflator at historical average minus one standard deviation in 2011-2012	18	18	18	18	17	16	13	10
B4. Net non-debt creating flows at historical average minus one standard deviation in 2011-2012 4/	18	22	25	24	23	22	18	11
B5. Combination of B1-B4 using one-half standard deviation shocks	18	21	25	24	23	22	18	11
B6. One-time 30 percent nominal depreciation relative to the baseline in 2011 5/	18	25	24	23	22	21	17	12
PV of debt-to-exports ratio								
Baseline	101	100	92	84	77	71	48	25
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2010-2030 1/	101	102	96	89	84	79	60	50
A2. New public sector loans on less favorable terms in 2010-2030 2	101	100	95	88	83	78	60	40
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2011-2012	101	97	90	82	76	70	47	25
B2. Export value growth at historical average minus one standard deviation in 2011-2012 3/	101	102	107	98	90	83	56	28
B3. US dollar GDP deflator at historical average minus one standard deviation in 2011-2012	101	97	90	82	76	70	47	25
B4. Net non-debt creating flows at historical average minus one standard deviation in 2011-2012 4/	101	121	135	123	114	105	69	30
B5. Combination of B1-B4 using one-half standard deviation shocks	101	115	130	119	109	101	67	29
B6. One-time 30 percent nominal depreciation relative to the baseline in 2011 5/	101	97	90	82	76	70	47	25
PV of debt-to-revenue ratio								
Baseline	170	170	161	153	147	141	112	77
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2010-2030 1/	170	174	168	164	160	158	140	155
A2. New public sector loans on less favorable terms in 2010-2030 2	170	170	166	162	159	156	140	123
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2011-2012	170	167	160	153	147	141	112	77
B2. Export value growth at historical average minus one standard deviation in 2011-2012 3/	170	169	173	165	158	152	120	79
B3. US dollar GDP deflator at historical average minus one standard deviation in 2011-2012	170	175	174	166	159	153	121	84
B4. Net non-debt creating flows at historical average minus one standard deviation in 2011-2012 4/	170	206	236	226	216	207	161	92
B5. Combination of B1-B4 using one-half standard deviation shocks	170	204	235	225	216	207	161	94
B6. One-time 30 percent nominal depreciation relative to the baseline in 2011 5/	170	235	224	214	205	197	156	108

Table 2.Bangladesh: Sensitivity Analysis for Key Indicators of Public and Publicly Guaranteed External Debt, 2010-2030 (continued)
(In percent)

Debt service-to-exports ratio

Baseline	6	6	6	6	5	4	4	2
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2010-2030 1/	6	6	6	6	5	5	4	3
A2. New public sector loans on less favorable terms in 2010-2030 2	6	6	6	6	5	5	4	3
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2011-2012	6	6	6	6	5	4	4	2
B2. Export value growth at historical average minus one standard deviation in 2011-2012 3/	6	6	7	6	5	5	4	2
B3. US dollar GDP deflator at historical average minus one standard deviation in 2011-2012	6	6	6	6	5	4	4	2
B4. Net non-debt creating flows at historical average minus one standard deviation in 2011-2012 4/	6	6	7	7	6	5	5	3
B5. Combination of B1-B4 using one-half standard deviation shocks	6	6	7	7	6	5	5	3
B6. One-time 30 percent nominal depreciation relative to the baseline in 2011 5/	6	6	6	6	5	4	4	2

Debt service-to-revenue ratio

Baseline	10	10	11	10	9	9	9	7
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2010-2030 1/	10	10	11	11	9	9	10	10
A2. New public sector loans on less favorable terms in 2010-2030 2	10	10	11	11	10	9	9	9
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2011-2012	10	10	11	10	9	9	9	7
B2. Export value growth at historical average minus one standard deviation in 2011-2012 3/	10	10	11	11	9	9	9	7
B3. US dollar GDP deflator at historical average minus one standard deviation in 2011-2012	10	10	12	11	10	10	10	7
B4. Net non-debt creating flows at historical average minus one standard deviation in 2011-2012 4/	10	10	12	12	11	10	13	9
B5. Combination of B1-B4 using one-half standard deviation shocks	10	10	12	13	11	11	13	9
B6. One-time 30 percent nominal depreciation relative to the baseline in 2011 5/	10	14	15	15	13	12	12	9
Memorandum item:								
Grant element assumed on residual financing (i.e., financing required above baseline) 6/	24	24	24	24	24	24	24	24

Sources: Country authorities; and staff estimates and projections.

1/ Variables include real GDP growth, growth of GDP deflator (in U.S. dollar terms), non-interest current account in percent of GDP, and non-debt creating flows.
2/ Assumes that the interest rate on new borrowing is by 2 percentage points higher than in the baseline., while grace and maturity periods are the same as in the baseline.
3/ Exports values are assumed to remain permanently at the lower level, but the current account as a share of GDP is assumed to return to its baseline level after the shock (implicitly assuming an offsetting adjustment in import levels).
4/ Includes official and private transfers and FDI.
5/ Depreciation is defined as percentage decline in dollar/local currency rate, such that it never exceeds 100 percent.
6/ Applies to all stress scenarios except for A2 (less favorable financing) in which the terms on all new financing are as specified in footnote 2.

Table 3.Bangladesh: Public Sector Debt Sustainability Framework, Baseline Scenario, 2007-2030
(In percent of GDP, unless otherwise indicated)

	Actual			Average	Standard Deviation	Estimate	Projections								
	2007	2008	2009			2010	2011	2012	2013	2014	2015	2010-15 Average	2020	2030	2016-30 Average
Public sector debt 1/	46.8	46.8	45.3			43.8	44.0	43.7	43.3	43.1	42.8		41.8	40.0	
o/w foreign-currency denominated	27.0	26.4	24.1			22.3	21.7	20.8	19.8	19.0	18.2		15.0	11.4	
Change in public sector debt	-0.1	-0.1	-1.5			-1.4	0.1	-0.2	-0.4	-0.3	-0.2		-0.2	-0.3	
Identified debt-creating flows	-2.6	-1.8	-2.1			-1.4	0.2	-0.1	-0.2	-0.2	-0.3		-0.2	-0.2	
Primary deficit	0.7	2.3	0.6	1.4	0.8	1.0	1.2	1.0	1.0	0.9	0.9	1.0	0.8	0.9	0.9
Revenue and grants	10.8	11.3	11.1			11.4	11.2	11.3	11.4	11.4	11.5		11.7	12.1	
of which: grants	0.6	0.4	0.7			0.7	0.7	0.7	0.7	0.7	0.7		0.7	0.7	
Primary (noninterest) expenditure	11.5	13.5	11.7			12.4	12.4	12.4	12.4	12.3	12.3		12.5	13.0	
Automatic debt dynamics	-3.3	-4.0	-2.7			-2.4	-1.0	-1.1	-1.2	-1.1	-1.1		-1.0	-1.2	
Contribution from interest rate/growth differential	-2.8	-2.4	-1.7			-1.3	-1.4	-1.4	-1.3	-1.2	-1.2		-1.1	-1.1	
of which: contribution from average real interest rate	0.0	0.4	0.9			0.8	1.0	1.1	1.1	1.3	1.3		1.4	1.3	
of which: contribution from real GDP growth	-2.8	-2.7	-2.6			-2.2	-2.4	-2.5	-2.5	-2.5	-2.4		-2.5	-2.4	
Contribution from real exchange rate depreciation	-0.5	-1.6	-1.0			-1.0	0.4	0.2	0.1	0.1	0.1		...	...	
Other identified debt-creating flows	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Privatization receipts (negative)	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Recognition of implicit or contingent liabilities	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Debt relief (HIPC and other)	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Other (specify, e.g. bank recapitalization)	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Residual, including asset changes	2.4	1.7	0.6			0.0	0.0	-0.2	-0.2	-0.1	0.0		0.0	0.0	
Other Sustainability Indicators															
PV of public sector debt	...	...	40.4			39.7	40.1	40.1	39.9	39.8	39.7		39.2	37.4	
o/w foreign-currency denominated	...	...	19.3			18.2	17.9	17.2	16.4	15.8	15.2		12.4	8.8	
o/w external	...	...	19.3			18.2	17.9	17.2	16.4	15.8	15.2		12.4	8.8	
PV of contingent liabilities (not included in public sector debt)	...	...	...			...	...	...	...	...	...		...	...	
Gross financing need 2/	3.4	5.3	3.6			4.1	4.3	4.4	4.4	4.2	4.1		4.2	4.0	
PV of public sector debt-to-revenue and grants ratio (in percent)	…	...	364.5			347.8	357.9	354.1	351.4	348.7	347.0		334.8	309.0	
PV of public sector debt-to-revenue ratio (in percent)	…	...	388.5			370.1	380.6	377.0	374.1	371.2	369.3		355.3	326.8	
o/w external 3/	…	…	185.3			169.9	169.7	161.3	153.5	146.9	140.9		112.2	76.7	
Debt service-to-revenue and grants ratio (in percent) 4/	24.5	27.2	27.5			27.5	28.2	29.7	29.6	28.8	28.5		28.5	25.4	
Debt service-to-revenue ratio (in percent) 4/	25.9	28.3	29.3			29.2	30.0	31.6	31.5	30.6	30.3		30.2	26.8	
Primary deficit that stabilizes the debt-to-GDP ratio	0.9	2.3	2.1			2.4	1.1	1.3	1.4	1.1	1.1		1.0	1.2	
Key macroeconomic and fiscal assumptions															
Real GDP growth (in percent)	6.4	6.2	5.9	5.8	0.7	5.0	5.8	6.0	6.0	6.0	6.0	5.8	6.3	6.3	6.3
Average nominal interest rate on forex debt (in percent)	0.9	1.0	0.8	1.0	0.1	1.5	1.5	1.5	1.6	1.6	1.6	1.5	1.8	1.8	1.8
Average real interest rate on domestic debt (in percent)	3.3	3.4	5.5	4.8	1.8	4.3	4.6	5.7	5.6	5.9	5.8	5.3	5.7	4.7	5.4
Real exchange rate depreciation (in percent, + indicates depreciation)	-1.7	-6.5	-3.9	0.2	4.6	-4.5	...	...	...	...	...	...	...	...	...
Inflation rate (GDP deflator, in percent)	6.8	8.8	6.4	4.8	2.2	6.4	6.0	5.0	5.0	4.5	4.5	5.2	4.0	4.0	4.0
Growth of real primary spending (deflated by GDP deflator, in percent)	0.0	0.2	-0.1	0.0	0.1	0.1	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)	...	...	...	…	…	15.1	30.3	30.1	30.3	30.4	30.3	27.8	29.4	28.2	...

Sources: Country authorities; and staff estimates and projections.

1/ Central government gross debt. The years in the table refer to fiscal years. Therefore, 2009 refers to July 2008-June 2009.

2/ Gross financing need is defined as the primary deficit plus debt service plus the stock of short-term debt at the end of the last period.

3/ Revenues excluding grants.

4/ Debt service is defined as the sum of interest and amortization of medium and long-term debt.

5/ Historical averages and standard deviations are generally derived over the past 10 years, subject to data availability.

Table 4.Bangladesh: Sensitivity Analysis for Key Indicators of Public Debt 2010-2030

	Projections							
	2010	2011	2012	2013	2014	2015	2020	2030
PV of Debt-to-GDP Ratio								
Baseline	40	40	40	40	40	40	39	37
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	40	40	41	41	41	41	43	45
A2. Primary balance is unchanged from 2010	40	40	40	40	40	40	40	38
A3. Permanently lower GDP growth 1/	40	40	40	40	40	40	40	40
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2011-201	40	40	41	41	41	41	41	40
B2. Primary balance is at historical average minus one standard deviations in 2011-2012	40	41	42	42	41	41	40	38
B3. Combination of B1-B2 using one half standard deviation shocks	40	41	41	41	41	41	41	39
B4. One-time 30 percent real depreciation in 2011	40	48	48	47	47	46	44	41
B5. 10 percent of GDP increase in other debt-creating flows in 2011	40	48	48	47	47	47	45	41
PV of Debt-to-Revenue Ratio 2/								
Baseline	348	358	354	351	349	347	335	309
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	348	359	358	358	359	361	371	373
A2. Primary balance is unchanged from 2010	348	356	352	349	347	347	339	318
A3. Permanently lower GDP growth 1/	348	358	355	353	352	351	344	334
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2011-201	348	360	360	358	357	356	347	327
B2. Primary balance is at historical average minus one standard deviations in 2011-2012	348	365	370	366	362	360	345	315
B3. Combination of B1-B2 using one half standard deviation shocks	348	363	366	363	361	359	347	322
B4. One-time 30 percent real depreciation in 2011	348	433	424	417	410	405	379	340
B5. 10 percent of GDP increase in other debt-creating flows in 2011	348	432	426	417	412	407	383	337
Debt Service-to-Revenue Ratio 2/								
Baseline	27	28	30	30	29	28	28	25
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	27	28	30	30	30	30	32	31
A2. Primary balance is unchanged from 2010	27	28	30	29	29	28	29	26
A3. Permanently lower GDP growth 1/	27	28	30	30	29	29	29	28
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2011-201	27	28	30	30	30	29	30	27
B2. Primary balance is at historical average minus one standard deviations in 2011-2012	27	28	30	32	32	30	29	26
B3. Combination of B1-B2 using one half standard deviation shocks	27	28	30	31	31	30	29	27
B4. One-time 30 percent real depreciation in 2011	27	30	35	35	34	34	35	32
B5. 10 percent of GDP increase in other debt-creating flows in 2011	27	28	33	54	32	36	30	30

Sources: Country authorities; and staff estimates and projections.
1/ Assumes that real GDP growth is at baseline minus one standard deviation divided by the square root of the length of the projection period.
2/ Revenues are defined inclusive of grants.