

TONGA: JOINT BANK-FUND DEBT SUSTAINABILITY ANALYSIS

This document provides an updated debt sustainability analysis (DSA) for Tonga.¹ The DSA was prepared jointly with the World Bank in accordance with the Debt Sustainability Framework for low-income countries approved by the Executive Boards of the IMF and IDA.²

Updated debt indicators imply that Tonga has moved into the category of low-income countries with a high risk of debt distress, representing a worsening of the situation since the last DSA. The baseline indicates a breach of the threshold for NPV of debt-to-exports from 2004/05 through 2016/17, which is exacerbated by stress tests. The remaining debt stock and debt service ratios are below indicative thresholds. Alternative scenarios and stress tests demonstrate that debt sustainability is critically dependent upon implementation of planned fiscal and private sector reforms.

A. Background

Tonga was found in March 2006 to have debt ratios below the HIPC Initiative thresholds. In line with the HIPC Initiative guidelines and the Boards' guidance, Tonga was not included in the list of countries potentially eligible for debt relief under the HIPC initiative.³

External public debt as a percent of GDP has declined over the past few years. External public debt fell in line with the decline in loan disbursements following the completion of

¹ The last comprehensive DSA for Tonga was prepared in the context of the 2005 Article IV Consultation.

² The debt data underlying this DSA were updated jointly by the IMF and the World Bank using information provided by the Tongan authorities. The DSA was in part based on data generated by the joint Fund/Bank board paper "Review of Financing of the Fund's Concessional Assistance and Debt Relief to Low-Income Member Countries" (March 2006). This data was fully reconciled up to end-December 2004, as per the requirements of the ring-fencing exercise. For the current DSA, the debt service projections for the end-December 2004 data were adapted to the Tonga fiscal year, which adheres to the DSA cut-off date (i.e. end-June 2005). The data was also updated for disbursements that took place between January and June 2005.

³ See the joint Fund/Bank board paper "Review of Financing of the Fund's Concessional Assistance and Debt Relief to Low-Income Member Countries" (March 2006), page 7. The HIPC Initiative thresholds are 150 percent for the ratio of the net present value of debt (NPV) to exports of goods and services and 250 percent for the ratio of NPV to fiscal revenue. To qualify under the second criterion a country must have ratios of exports of goods and services to GDP and fiscal revenue to GDP above 30 percent and 15 percent, respectively.

large projects financed by the ADB. Private external debt increased in 2003/04 by an estimated \$25 million following the refinancing operation of a large private utility company.

A key feature of the LIC-DSA framework is that it compares debt burden indicators to indicative policy-based thresholds. The

thresholds are based on the empirical finding that low-income countries with stronger policies and institutions tend to have a higher debt carrying capacity. At end 2004/05, the latest date for which comprehensive data is

available, the stock of external public debt amounted to \$76.4 million, with a net present value of \$50.1 million. Tonga's NPV of debt-to-exports ratio is estimated at 128.1 percent (the relevant policy-based indicative threshold is 100 percent).⁴ The ratio is expected to fall to 102.7 percent by 2015/16 and to 66.1 percent by 2025/26. Other relevant indicators, including the NPV of debt-to-GDP, remain below the thresholds throughout the projection period.

External Public Debt Indicators		
	Indicative Threshold 1/	2004/05
NPV of debt in percent of		
<i>GDP</i>	30	23.3
<i>Exports</i>	100	128.1
<i>Revenues</i>	200	79.8
Debt service in percent of		
<i>Exports</i>	15	8.4
<i>Revenues</i>	25	7.0
1/ Shows policy indicative thresholds as used in the joint IMF-World Bank low-income country DSA framework for a poor policy performer.		

B. Medium-term Macroeconomic Framework

The medium-term framework assumes that the planned fiscal adjustment fails and other reforms stall. A continued fiscal deficit of between 4 and 4½ percent is projected in this case, with limited improvement in revenue administration and a continued high wage bill. As external assistance is expected to decline without reform efforts, the budget would have to rely on domestic financing, placing continued pressure on inflation, the current account and foreign reserves.⁵ In this environment, the authorities will not be able to increase public capital expenditure and improve the business climate needed to foster private investment. In addition, tight monetary conditions will be needed to contain credit growth, further hampering private sector activity. With limited public and private investment, GDP growth will remain at about 1 percent, below the historical average. A near-term decline in the real exchange rate should help to improve the current account and turn it into a small surplus by 2010/11.

⁴ The World Bank's Country Policy and Institutional Assessment (CPIA) index summarizes the quality of a country's policies. Based on this index, a country is categorized as a strong, medium or poor performer. The appropriate debt thresholds vary by category. In the latest CPIA (2005), Tonga is classified as a poor performer, the thresholds for which are: NPV of debt-to-exports (100 percent), GDP (30 percent) and revenues (200 percent); and debt service in percent of exports (15 percent) and revenues (25 percent).

⁵ In 2004/05, about 12 percent of total public expenditure was financed by external assistance (3.2 percent of GDP).

Key Macroeconomic Assumptions
(In percent, unless stated otherwise)

Period average	2000/01-04/05	2005/06-10/11	2011/12-25/26
Real GDP growth	2.5	1.5	1.0
Export growth	15.1	1.7	3.5
Current account (in percent of GDP)	-1.6	-3.1	0.4
Inflation	9.9	16.3	14.6
Overall fiscal balance (in percent of GDP)	-0.5	-4.1	-4.2
<i>Memorandum items:</i>			
Revenue and grants (in percent of GDP)	29.3	26.2	25.0
Gross financing need (in percent of GDP)	3.2	6.2	5.7

C. External Debt Sustainability Analysis

In the baseline scenario, the NPV of debt-to-exports breaches the policy-dependent threshold by a large margin and is sustained over the medium term. (Table 1). The NPV of external public debt to exports is expected to remain above indicative thresholds until 2016/17, but continue its decline to 66 percent by 2025/26 reflecting the limited availability of external finance without reform efforts. While this ratio is above the indicative threshold of 100 percent for much of the projection period, the high level of remittances has a countervailing effect.⁶ Tonga's external public debt as a percent of GDP is projected to increase slightly over the next few years and then decline steadily. The remaining indicators are projected to remain below indicative threshold levels.

Stress tests underscore that Tonga's debt profile is vulnerable to adverse shocks. (Table 2, Figure 1). One of the largest risks identified among the set of stress tests is a sharp fall in net transfers (historical average minus one standard deviation) in 2006/07–07/08. one of the highest recipients of net remittances among developing countries, which amounted to more than 40 percent of GDP in 2004/05. This scenario could arise if there is a sharp fall in net private remittances due to a recession in those countries where Tongans living abroad reside. If this were to occur, the debt stock indicators would rise well above threshold levels, although the debt service ratio would remain under the policy-dependent threshold. In contrast, a return of key variables to historical averages, which includes higher GDP growth than in the baseline scenario, would imply an improvement in all ratios.

D. Fiscal Debt Sustainability Analysis

The sizeable level of domestic debt poses an additional risk to fiscal sustainability (Table 3). At end-2004/05, domestic debt was 15.4 percent of GDP, bringing total public debt to 50.8 percent of GDP. Domestic public debt and, as a result, total public debt are projected to increase over the next five years due to the domestic financing of the fiscal

⁶ In 2004/05, net remittances were over two times the value of exports.

deficit, reaching a high of 62.6 percent in 2010/11. The gradual build up of domestic public debt is projected to continue thereafter.

Alternative scenarios and stress tests highlight the vulnerability of the total public debt position (Table 4, Figure 2). A one-time 30 percent real depreciation or a 10 percent of GDP increase in other debt-creating flows in 2006/07 would cause quite a sharp increase in the debt stock and debt service indicators. These scenarios could unfold if the National Reserve Bank of Tonga needs to devalue the currency, or if the government requires additional financing due to a further deterioration of revenue administration or expenditure management. On the other hand, a return of real GDP growth and primary fiscal balance to historical averages would see a marked improvement in all ratios.

E. Staff Assessment

Based on the LIC-DSA, staffs conclude that Tonga's external debt dynamics are subject to a high risk of debt distress. The NPV of debt-to-exports remains above the threshold by a large margin over much of the projection period in the baseline scenario, and is exacerbated by stress tests. In addition, the threshold for an additional debt stock indicator (i.e. NPV of debt-to-GDP) is breached by the alternative scenarios and stress tests. The remaining debt stock and debt service indicators remain below the indicative thresholds. While stress tests highlight some vulnerabilities to debt sustainability, including the risks around a sharp fall in net transfers or the value of the currency, the alternative scenarios, in contrast, show that a return of GDP growth and the primary balance to historical averages would strongly enhance debt sustainability. This further emphasizes the critical importance of fully implementing the planned fiscal and private sector reforms.

Table 1. Tonga: External Debt Sustainability Framework, Reforms Stall Scenario, 2002/03-2025/26 1/
(In percent of GDP, unless otherwise indicated)

	Actual			Historical Average 6/	Standard Deviation 6/	Estimate					Projections					
	2002/03	2003/04	2004/05			2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2005/06-10/11 Average	2015/16	2025/26	2011/12-25/26 Average	
External debt (nominal) 1/	41.8	55.1	45.8			44.2	44.4	44.4	43.3	42.0	39.1				32.1	21.5
o/w public and publicly guaranteed (PPG)	41.8	41.4	35.5			35.8	37.3	38.9	39.4	40.0	39.1				32.1	21.5
Change in external debt	-1.2	13.3	-9.4			-1.5	0.1	0.1	-1.1	-1.3	-2.9				-1.2	-0.9
Identified net debt-creating flows	-1.6	-8.5	-9.1			5.1	7.0	4.9	1.6	0.5	0.1				0.2	0.3
Non-interest current account deficit	2.7	-4.7	3.7	2.7	5.3	5.2	6.5	3.8	0.5	-0.6	-0.9				-0.8	-0.7
Deficit in balance of goods and services	39.0	39.4	46.4			46.4	49.6	49.0	47.1	47.4	47.1				47.0	46.9
Exports	26.7	21.8	18.2			18.8	18.8	19.0	19.4	19.8	19.9				19.9	19.8
Imports	65.7	61.2	64.6			65.2	68.4	68.0	66.5	67.1	67.0				66.9	66.7
Net current transfers (negative = inflow)	-36.9	-43.9	-42.7	-30.8	9.0	-40.0	-42.1	-44.2	-45.7	-47.2	-47.3				-47.3	-47.2
Other current account flows (negative = net inflow)	0.6	-0.3	0.0			-1.1	-1.0	-1.0	-0.9	-0.8	-0.7				-0.6	-0.4
Net FDI (negative = inflow)	-0.2	1.0	-5.4	-1.0	1.9	-0.2	0.9	0.9	0.9	0.9	0.9				0.9	0.9
Endogenous debt dynamics 2/	-4.2	-4.7	-7.4			0.1	-0.4	0.1	0.2	0.2	0.1				0.1	0.1
Contribution from nominal interest rate	0.3	0.5	1.1			0.9	0.9	0.8	0.7	0.6	0.5				0.4	0.3
Contribution from real GDP growth	-1.3	-0.5	-1.1			-0.8	-1.2	-0.6	-0.5	-0.4	-0.4				-0.3	-0.2
Contribution from price and exchange rate changes	-3.2	-4.8	-7.4			...	...	...	...	...	...				...	...
Residual (3-4) 3/	0.4	21.8	-0.3			-6.6	-6.9	-4.8	-2.7	-1.8	-3.0				-1.4	-1.2
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
NPV of external debt 4/	...	...	33.5			30.4	30.3	29.9	28.7	27.0	24.8				20.4	13.1
In percent of exports	...	...	184.5			161.3	161.4	157.2	148.3	136.9	124.6				102.7	66.1
NPV of PPG external debt	...	...	23.3			22.0	23.3	24.3	24.8	25.0	24.8				20.4	13.1
In percent of exports	...	...	128.1			116.6	123.9	127.8	128.3	126.7	124.6				102.7	66.1
Debt service-to-exports ratio (in percent)	6.0	8.7	19.6			17.4	19.9	20.1	21.0	19.1	19.9				8.4	6.3
PPG debt service-to-exports ratio (in percent)	6.0	8.7	8.4			7.1	9.3	9.4	10.3	8.6	9.7				8.4	6.3
Total gross financing need (millions of U.S. dollars)	6.7	-3.4	4.1			18.7	24.5	18.5	11.7	8.7	8.6				4.6	5.4
Non-interest current account deficit that stabilizes debt ratio	3.9	-18.0	13.1			6.8	6.3	3.7	1.6	0.7	2.0				0.4	0.2
Key macroeconomic assumptions																
Real GDP growth (in percent)	3.2	1.4	2.3	2.3	2.3	1.9	2.7	1.4	1.2	1.0	1.0				1.5	1.0
GDP deflator in US dollar terms (change in percent)	8.2	12.8	15.4	0.5	9.9	2.4	-4.3	-3.8	-2.1	-1.7	1.2				-1.4	2.5
Effective interest rate (percent) 5/	0.9	1.4	2.3	1.4	0.4	2.1	1.9	1.7	1.6	1.4	1.2				1.7	1.4
Growth of exports of G&S (US dollar terms, in percent)	23.7	-6.9	-1.4	2.4	22.1	8.2	-1.8	-1.4	0.8	1.4	2.9				1.7	3.5
Growth of imports of G&S (US dollar terms, in percent)	31.1	6.5	24.8	7.1	17.7	5.3	3.2	-3.0	-3.1	0.3	2.0				0.8	3.5
Grant element of new public sector borrowing (in percent)	...	...	...	...	...	56.9	56.9	56.9	56.9	56.9	56.9				56.9	56.9
<i>Memorandum item:</i>																
Nominal GDP (millions of US dollars)	159.2	182.1	215.1			224.5	220.8	215.4	213.3	211.9	216.6				257.6	364.2

Source: Staff simulations.

1/ Includes both public and private sector external debt.

2/ Derived as $[r - g - \rho(1+g)] / (1+g+\rho+g\rho)$ 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 NPV 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.

Table 2. Tonga: Sensitivity Analysis for Key Indicators of Public and Publicly Guaranteed External Debt, 2005/06-2025/26
(In percent)

	Estimate		Projections					
	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2015/16	2025/26
NPV of debt-to-GDP ratio								
Baseline	22	23	24	25	25	25	20	13
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2006/07-25/26 1/	22	20	18	18	18	18	18	21
A2. New public sector loans on less favorable terms in 2006/07-25/26 2/	22	24	26	27	28	28	25	20
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2006/07-07/08	22	24	25	26	26	26	21	14
B2. Export value growth at historical average minus one standard deviation in 2006/07-07/08 3/	22	25	29	29	30	30	25	16
B3. US dollar GDP deflator at historical average minus one standard deviation in 2006/07-07/08	22	25	27	28	28	28	23	15
B4. Net non-debt creating flows at historical average minus one standard deviation in 2006/07-07/08 4/	22	32	43	45	46	46	42	27
B5. Combination of B1-B4 using one-half standard deviation shocks	22	31	43	44	45	45	41	26
B6. One-time 30 percent nominal depreciation relative to the baseline in 2006/07 5/	22	34	35	36	36	36	30	19
NPV of debt-to-exports ratio								
Baseline	117	124	128	128	127	125	103	66
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2006/07-25/26 1/	117	106	96	92	90	90	92	105
A2. New public sector loans on less favorable terms in 2006/07-25/26 2/	117	128	135	139	140	140	126	100
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2006/07-07/08	117	124	128	128	127	125	103	66
B2. Export value growth at historical average minus one standard deviation in 2006/07-07/08 3/	117	161	226	227	226	223	192	123
B3. US dollar GDP deflator at historical average minus one standard deviation in 2006/07-07/08	117	124	128	128	127	125	103	66
B4. Net non-debt creating flows at historical average minus one standard deviation in 2006/07-07/08 4/	117	171	228	232	233	232	213	135
B5. Combination of B1-B4 using one-half standard deviation shocks	117	176	253	257	258	257	235	149
B6. One-time 30 percent nominal depreciation relative to the baseline in 2006/07 5/	117	124	128	128	127	125	103	66
Debt service ratio								
Baseline	7	9	9	10	9	10	8	6
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2006/07-25/26 1/	8	7	8	8	8	7	7	7
A2. New public sector loans on less favorable terms in 2006/07-25/26 2/	8	7	10	10	11	9	9	9
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2006/07-07/08	8	7	9	9	10	8	8	6
B2. Export value growth at historical average minus one standard deviation in 2006/07-07/08 3/	8	9	14	14	16	13	12	11
B3. US dollar GDP deflator at historical average minus one standard deviation in 2006/07-07/08	8	7	9	9	10	8	8	6
B4. Net non-debt creating flows at historical average minus one standard deviation in 2006/07-07/08 4/	8	7	10	11	12	10	9	12
B5. Combination of B1-B4 using one-half standard deviation shocks	8	8	12	13	13	11	10	13
B6. One-time 30 percent nominal depreciation relative to the baseline in 2006/07 5/	8	7	9	9	10	8	8	6
<i>Memorandum item:</i>								
Grant element assumed on residual financing (i.e., financing required above baseline) 6/	57	57	57	57	57	57	57	57

Source: Staff projections and simulations.

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. Tonga: Public Sector Debt Sustainability Framework, Reforms Stall Scenario, 2002/03-2025/26
(In percent of GDP, unless otherwise indicated)

	Actual			Historical Average 5/	Standard Deviation 5/	Estimate					Projections				
	2002/03	2003/04	2004/05			2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2005/06- 2010/11 Average	2015/16	2025/26	2011/12- 2025-26 Average
Public sector debt 1/	66.0	60.4	50.8			51.3	53.9	56.6	59.0	61.3	62.6		60.5	53.0	
o/w foreign-currency denominated	41.0	40.6	35.4			37.2	38.7	40.3	40.9	41.5	40.6		32.3	21.6	
Change in public sector debt	1.0	-5.7	-9.6			0.4	2.6	2.7	2.4	2.3	1.4		-0.4	-0.8	
Identified debt-creating flows	-3.1	-9.4	-12.0			0.4	2.7	2.8	2.4	2.3	1.4		-0.3	-0.8	
Primary deficit	2.4	-1.7	-3.3	0.2	2.1	1.0	3.8	3.6	3.5	3.4	3.4	3.1	2.1	0.4	1.3
Revenue and grants	28.4	29.9	29.1			29.4	27.7	25.1	25.1	25.0	25.0		25.0	25.0	
of which : grants	0.8	1.4	1.3			1.6	1.3	1.2	1.2	1.2	1.1		0.5	0.1	
Primary (noninterest) expenditure	30.8	28.1	25.8			30.4	31.5	28.6	28.5	28.4	28.4		27.1	25.4	
Automatic debt dynamics	-6.6	-5.8	-6.8			-0.6	-1.1	-0.7	-1.0	-1.0	-1.9		-2.4	-1.2	
Contribution from interest rate/growth differential	-4.1	-1.9	-2.9			-2.0	-3.7	-3.1	-2.7	-2.5	-2.3		-2.3	-1.1	
of which : contribution from average real interest rate	-2.1	-1.0	-1.5			-1.0	-2.4	-2.3	-2.0	-2.0	-1.6		-1.7	-0.5	
of which : contribution from real GDP growth	-2.0	-0.9	-1.4			-0.9	-1.4	-0.8	-0.7	-0.6	-0.6		-0.6	-0.5	
Contribution from real exchange rate depreciation	-2.5	-3.9	-3.9			1.4	2.6	2.4	1.7	1.5	0.3		...	...
Other identified debt-creating flows	1.2	-1.9	-1.8			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	1.2	-1.9	-1.8			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	4.0	3.7	2.4			0.0	-0.1	-0.1	-0.1	-0.1	-0.1		0.0	0.0	
NPV of public sector debt	...	...	38.6			36.9	39.3	41.5	43.8	45.7	47.7		48.7	44.5
o/w foreign-currency denominated	...	...	23.2			22.8	24.2	25.2	25.8	26.0	25.7		20.5	13.1
o/w external	...	...	23.2			22.8	24.2	25.2	25.8	26.0	25.7		20.5	13.1
NPV of contingent liabilities (not included in public sector debt)	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Gross financing need 2/	5.5	1.9	0.0			3.9	6.9	6.6	6.8	6.5	6.7		6.0	5.2	
NPV of public sector debt-to-revenue ratio (in percent) 3/	...	...	132.7			125.3	141.7	165.3	174.9	182.5	190.7		194.6	177.9
o/w external	...	...	79.8			77.3	87.1	100.4	102.7	103.7	102.6		81.8	52.5
Debt service-to-revenue ratio (in percent) 3/ 4/	6.8	7.5	7.0			6.1	8.0	9.2	10.9	10.1	11.5		14.6	19.1	
Primary deficit that stabilizes the debt-to-GDP ratio	1.4	3.9	6.2			0.5	1.2	0.8	1.1	1.1	2.0		2.5	1.2	
Key macroeconomic and fiscal assumptions															
Real GDP growth (in percent)	3.2	1.4	2.3	1.8	2.5	1.9	2.7	1.4	1.2	1.0	1.0	1.5	1.0	1.0	1.0
Average nominal interest rate on forex debt (in percent)	0.9	1.3	1.1	1.3	0.3	1.1	1.3	1.3	1.2	1.2	1.2	1.2	1.4	1.5	1.4
Average real interest rate on domestic currency debt (in percent)	-6.7	-3.3	-6.0	7.0	5.2	-3.6	-13.5	-13.3	-10.6	-9.3	-6.8	-9.5	-5.4	-1.4	-3.3
Real exchange rate depreciation (in percent, + indicates depreciation)	-6.2	-9.7	-10.0	-2.6	20.3	4.1
Inflation rate (GDP deflator, in percent)	8.9	5.0	9.5	-0.1	16.8	7.2	20.5	20.0	17.9	16.2	13.1	15.8	14.6	14.6	14.6
Growth of real primary spending (deflated by GDP deflator, in percent)	1.1	-7.4	-6.2	10.1	29.3	20.3	6.5	-7.8	0.8	0.7	0.8	3.5	0.4	1.1	0.3
Grant element of new external borrowing (in percent)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	...

Sources: Country authorities; and Fund staff estimates and projections.

1/ Central government. Debt is gross and includes government-guaranteed debt.

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 including 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. Tonga: Sensitivity Analysis for Key Indicators of Public Debt 2005/06-2025/26

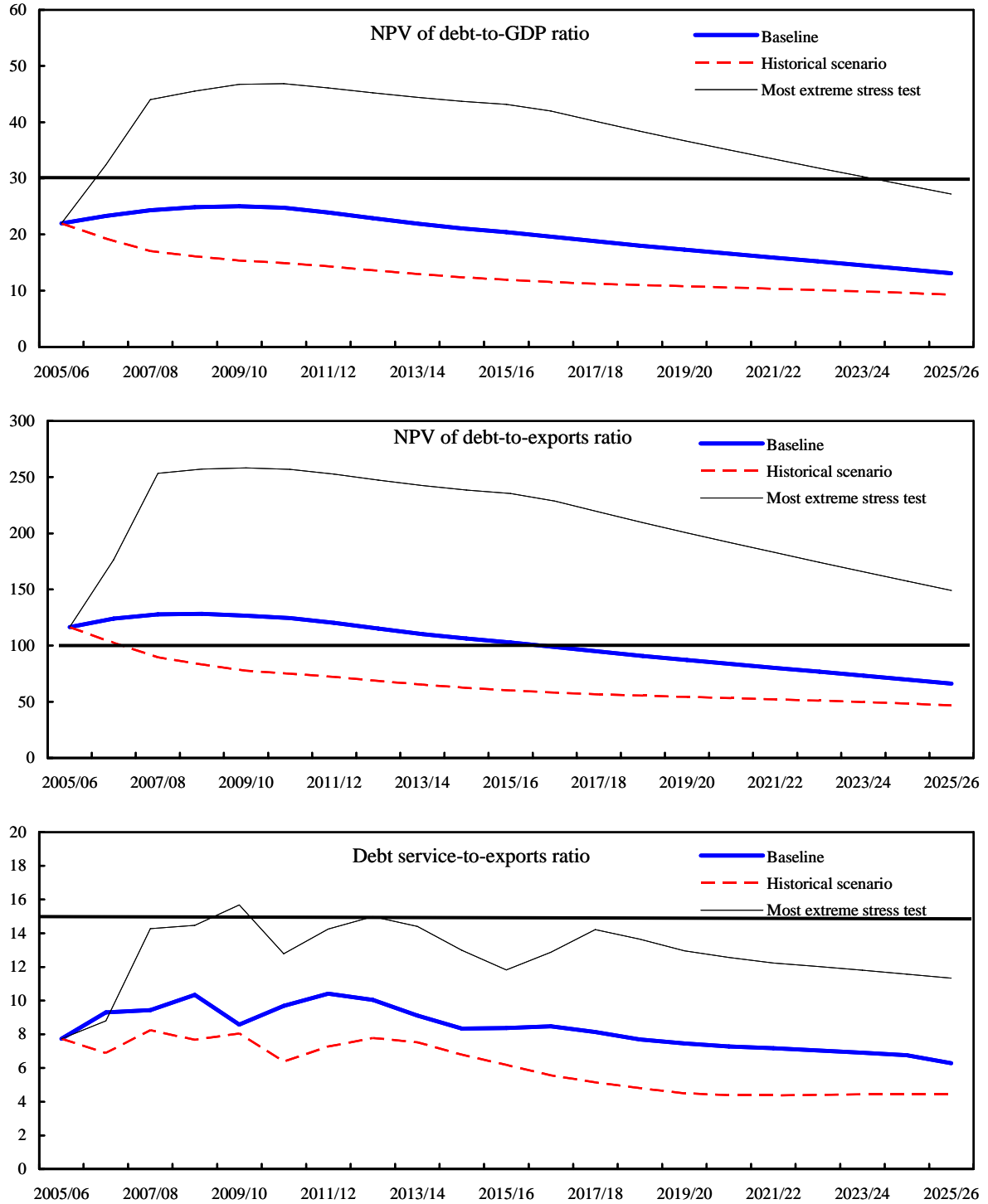
	Estimate		Projections					
	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2015/16	2025/26
NPV of Debt-to-GDP Ratio								
Baseline	37	39	41	44	46	48	49	45
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	37	36	35	34	32	30	20	8
A2. Permanently lower GDP growth 1/	37	40	42	45	48	51	59	80
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2006/07-2007/08	37	42	46	50	53	57	65	76
B2. Primary balance is at historical average minus one standard deviations in 2006/07-2007/08	37	38	39	41	43	45	46	41
B3. Combination of B1-B2 using one half standard deviation shocks	37	38	38	40	41	43	43	38
B4. One-time 30 percent real depreciation in 2006/07	37	54	57	60	62	64	64	58
B5. 10 percent of GDP increase in other debt-creating flows in 2006/07	37	49	51	54	57	59	61	58
NPV of Debt-to-Revenue Ratio 2/								
Baseline	125	142	165	175	182	191	195	178
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	125	131	140	135	128	122	81	30
A2. Permanently lower GDP growth 1/	125	143	169	181	191	203	234	320
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2006/07-2007/08	125	149	183	198	212	227	259	303
B2. Primary balance is at historical average minus one standard deviations in 2006/07-2007/08	125	137	155	164	171	179	182	164
B3. Combination of B1-B2 using one half standard deviation shocks	125	136	151	159	165	172	173	153
B4. One-time 30 percent real depreciation in 2006/07	125	194	226	238	247	256	255	232
B5. 10 percent of GDP increase in other debt-creating flows in 2006/07	125	175	204	217	227	237	244	230
Debt Service-to-Revenue Ratio 2/								
Baseline	6	8	9	11	10	11	15	19
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	6	8	4	4	2	3	5	0
A2. Permanently lower GDP growth 1/	6	8	9	12	11	13	19	35
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2006/07-2007/08	6	8	11	14	14	15	20	34
B2. Primary balance is at historical average minus one standard deviations in 2006/07-2007/08	6	8	7	8	9	11	14	17
B3. Combination of B1-B2 using one half standard deviation shocks	6	8	6	7	8	10	13	15
B4. One-time 30 percent real depreciation in 2006/07	6	8	10	12	12	13	16	22
B5. 10 percent of GDP increase in other debt-creating flows in 2006/07	6	8	23	17	14	14	17	27

Sources: Country authorities; and Fund staff estimates and projections.

1/ Assumes that real GDP growth is at baseline minus one standard deviation divided by the square root of 20 (i.e., the length of the projection period).

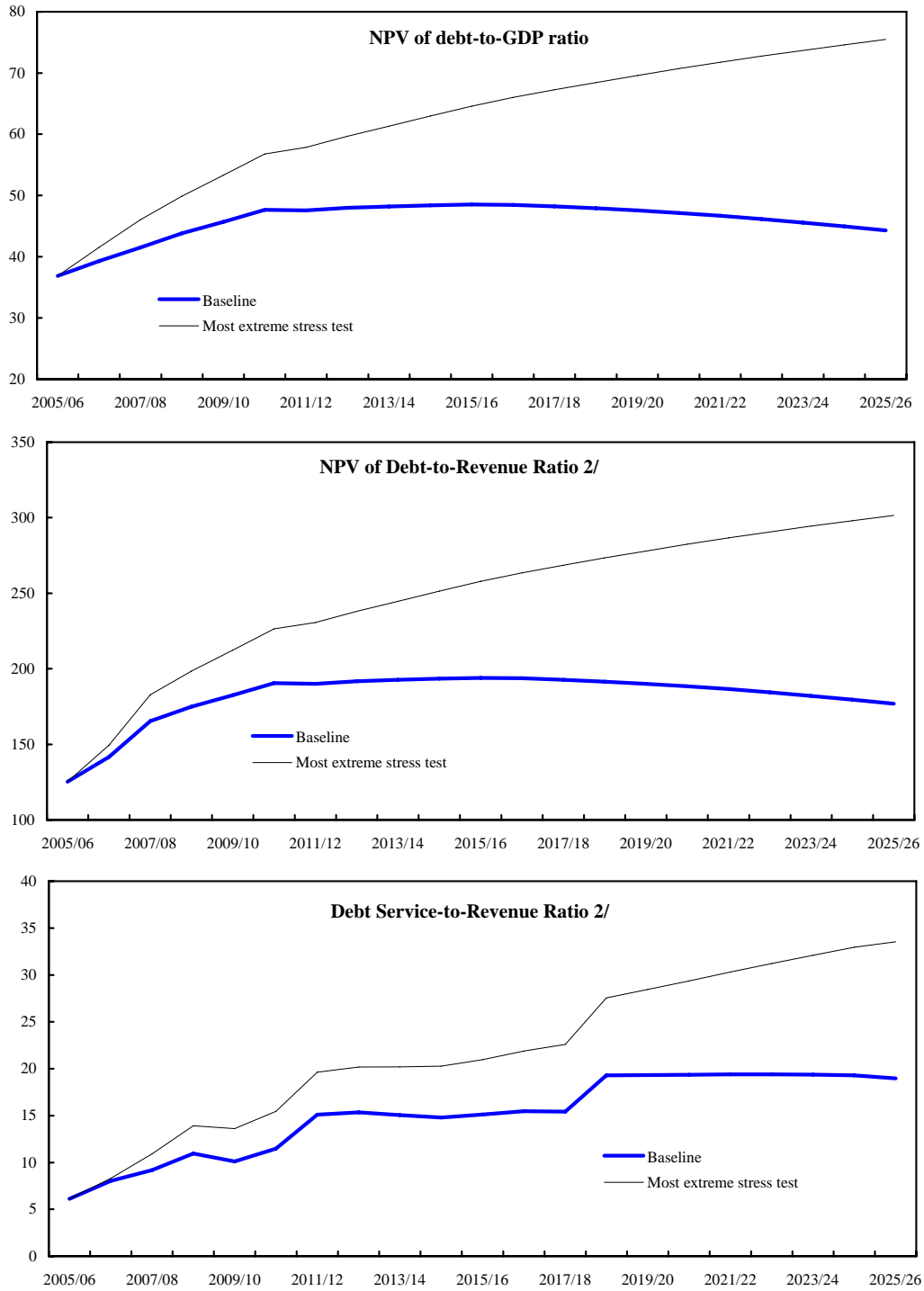
2/ Revenues are defined inclusive of grants.

Figure 1. Tonga: Indicators of Public and Publicly Guaranteed External Debt Under Alternative Scenarios, 2005/06-2025/26 (In percent)



Source: Staff projections and simulations.

Figure 2.Tonga : Indicators of Public Debt Under Alternative Scenarios, 2005/06-2025/26 (In percent) 1/



Source: Staff projections and simulations.

1/ Most extreme stress test is test that yields highest ratio in 2015/16.

2/ Revenue including grants.