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STAFF REPORT FOR THE 2016 ARTICLE IV CONSULTATION—DEBT SUSTAINABILITY ANALYSIS

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Risk of external debt distress	Moderate

This is the second update of the debt sustainability analysis (DSA) conducted jointly by the IMF and the World Bank since 2014.[1] *The results for external debt indicate that Tonga remains at a moderate risk of debt distress, and the highest risk to debt sustainability emanates from a combination of shocks to GDP, exports, the U.S. dollar deflator and grants. Analysis of public debt points to risks stemming from strong wage growth.*

[1] The last full DSA was prepared in June 2014 (SM/14/173, Sup.2). In line with the Staff Guidance Note on the Application of the Joint Bank-Fund Debt Sustainability Framework for Low-Income Countries in April 2016, Factsheet URL: http://www.imf.org/external/np/exr/facts/jdsf.htm, a full DSA is expected to be prepared every three years, or whenever circumstances have changed significantly since the previous DSA, such as a change in the external risk rating or overall risk assessment. Light updates should be prepared in intervening years. With the latest three-year average score of 3.47, Tonga is classified as a medium performer according to the World Bank Country Policy and Institutional Assessment (CPIA).

UNDERLYING ASSUMPTIONS

Compared with the DSA update in 2015, the underlying assumptions remain broadly stable (Table 1) with growth converging to 1.8 percent in the medium-term to factor in downside effects of periodic shocks from natural disasters. The following highlights the main changes:

- With the new global price outlook, the GDP and exports deflators have been revised downward, leading to lower nominal GDP and exports during the projection period.

- The fiscal balance deteriorates versus the previous DSA, reflecting higher wage spending and lower grants from development partners, and assuming more financing to Tonga in the form of loans.

Tonga: Key Macroeconomic Assumptions

	2014 DSA 2014-19 avg	2015 DSA 2015-20 avg	2016 DSA 2016-21 avg
Real GDP	2.26	2.44	2.40
GDP deflator (percent change)	2.66	2.06	0.84
Overall fiscal balance (percent of GDP)	-0.15	-0.90	-1.11
Primary balance (percent of GDP)	0.77	0.06	-0.30
Growth of exports of G&S (U.S. dollar terms)	5.58	7.90	4.62
Growth of imports of G&S (U.S. dollar terms)	5.86	6.03	4.76
Current account (percent of GDP)	-3.63	-5.16	-7.28

Sources: national authorities; and IMF staff estimates.

The current account deficit also worsens, assuming larger non-debt creating inflows (capital grants cash and in-kind) in the run-up to the South Pacific Games (SPG).

EXTERNAL DSA

Under the baseline scenario, all Tonga's external debt distress indicators remain below their country-specific policy-based indicative thresholds (Figure 1). The rise in debt service ratios from 2019 to 2029 reflects mostly repayments of the two external loans from China EXIM Bank. The bound tests demonstrate that with a combined shock to GDP, exports, the U.S. dollar GDP deflator and non-debt creating inflows, three debt ratios (PV of debt-to-GDP+remittances, PV of debt-to-exports+remittances and debt service-to-revenue) breach their respective thresholds, two of which significantly and on a more sustained basis, suggesting a moderate risk of debt distress.

Additional risks arise from a potential shortfall of donor grants to finance the SPG and periodic spending to respond to natural disasters. To illustrate these risks, an alternative scenario has been prepared assuming about T$100 million being borrowed to finance the capital costs of the games during FY2016–19, on the terms of China's EXIM Bank loan (2 percent interest, 20-year maturity, and 5-year grace period).[2] It is also assumed that natural disasters once every 4 years, leading to a decline in GDP by about 2 percentage points and to additional spending on recovery, amounting to about one percent of GDP in the following years. Although past recovery efforts have been generously grant-financed by donors, the assumption is that financing will diminish going forward. Compared to the baseline scenario, debt ratios will increase, narrowing their distance to thresholds

[2] The most recent projections of the costs of the SPG range from T$80 million to T$100 million. This is down from previous estimates to reflect the authorities' decision to utilize existing facilities rather than construct new accommodations.

significantly but not breaching them. Hence, the moderate risk rating remains under this alternative scenario.

PUBLIC SECTION DSA[3]

Under the baseline scenario, the present value of public debt is projected to remain below the benchmark throughout the projection period (Figure 2), steadily decreasing to below 20 percent of nominal GDP. However, in the scenarios in which the primary balance remains at the level of 2016 throughout the projected period, or the public wage bill grows at an average rate of the past three years (7 percent) during the projection period, public debt becomes unsustainable.

CONCLUSION

Compared to the DSA update of 2015,[4] the risks to debt sustainability increased somewhat as demonstrated by the results of the most extreme shock simulations. Additional risks stem from the inability of the government to contain wage growth. However, the risk of external and public debt distress continues to be classified as moderate.

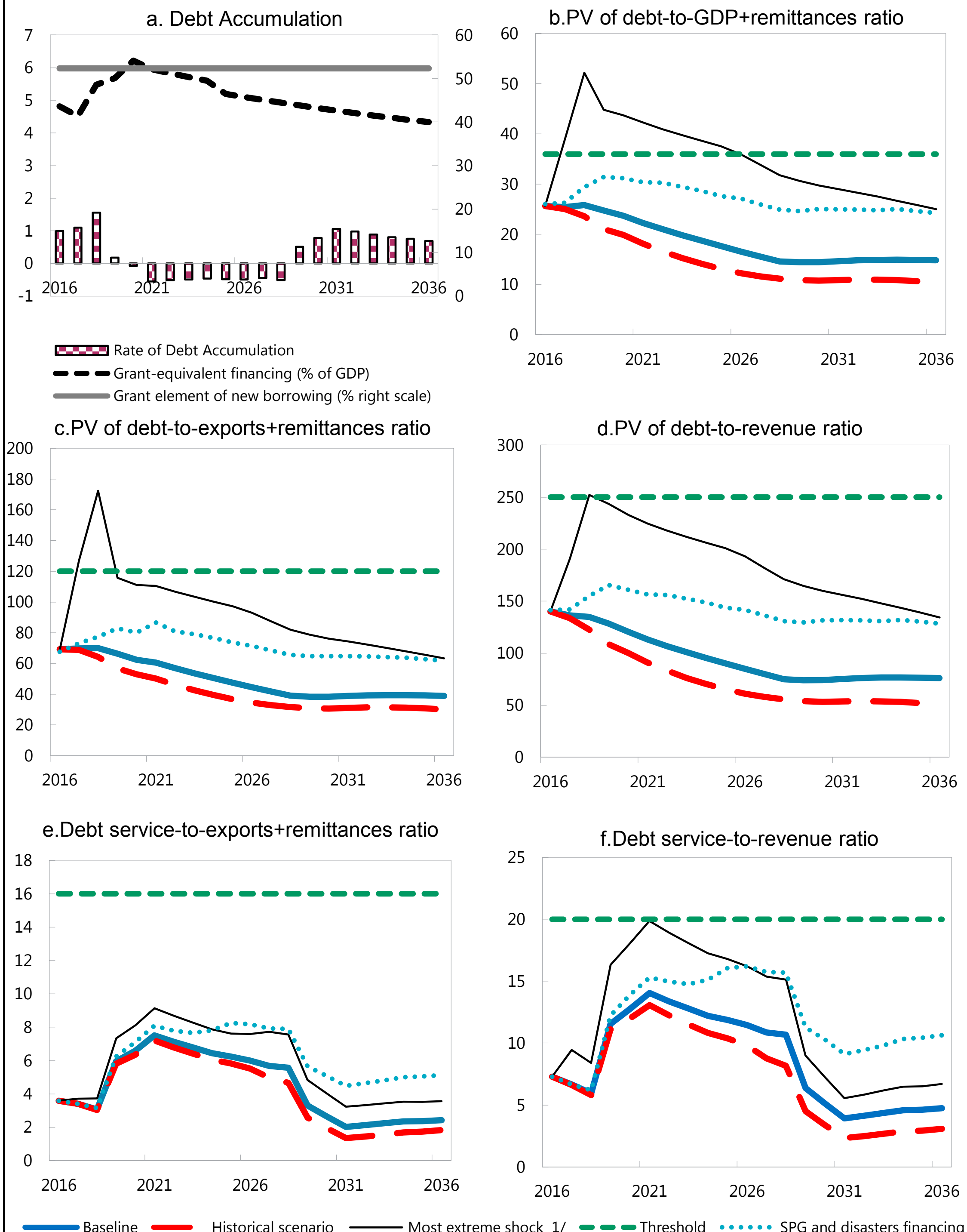
Authorities' views

The authorities broadly agreed with the staff assessment of debt sustainability risks. They strive to maintain robust debt policies. To that end, they have recently finalized the Debt Management Policy and are taking steps to alleviate debt burden, including negotiating debt forgiveness with the Bank of China (T$8 million) and refinancing debt to the Pension Fund. They are concerned, however, that a higher share of loan financing by development partners (the World Bank and the Asian Development Bank) following Tonga's upgrade to a moderate level of risk of debt distress in 2014 could undermine debt sustainability. They agree with the staff that other risks emanate from the pressure to raise public sector wages and to finance the SPG, and that it is important to maintain fiscal buffers for contingencies, such as natural disasters.

[3] The public sector comprises the central government and there is no local government in Tonga. The Country Policy and Institutional Assessment (CPIA) rating for Tonga remains at a medium level with a three-year average score of 3.47. The Tonga fiscal year starts in July.

[4] See IMF Staff Report of the 2015 Article IV Consultation –Debt Sustainability Analysis Update.

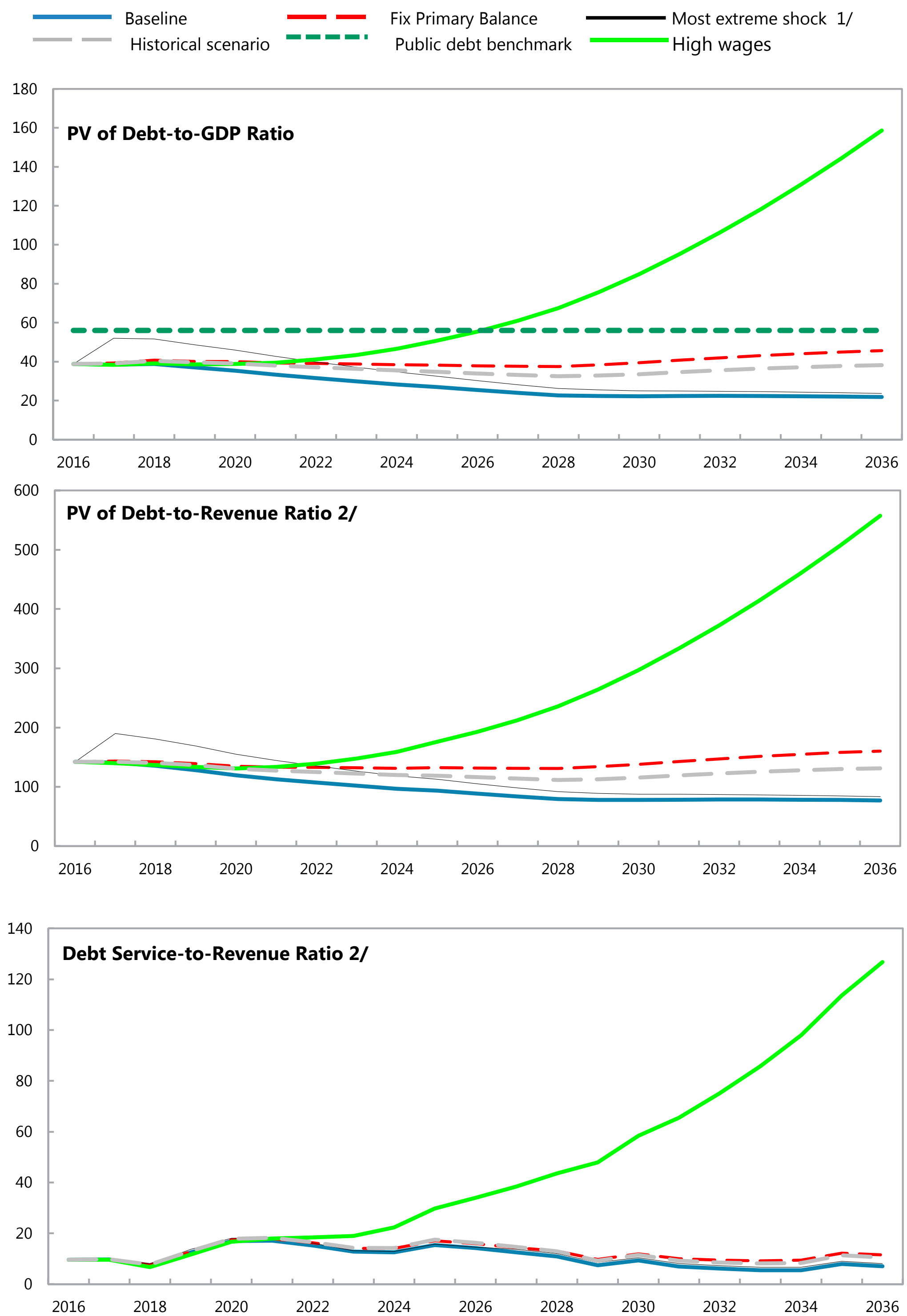
Figure 1. Tonga: Indicators of Public and Publicly Guaranteed External Debt under Alternatives Scenarios, 2016-2036 1/



Sources: Country authorities; and staff estimates and projections.

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

Figure 2.Tonga: Indicators of Public Debt Under Alternative Scenarios, 2016-2036 1/



Sources: Country authorities; and staff estimates and projections.

1/ The most extreme stress test is the test that yields the highest ratio on or before 2026.

2/ Revenues are defined inclusive of grants.

Table 1. Tonga: DSA Update; Key Variables 1/

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2025	2030	2035
	(Percent of GDP, unless otherwise indicated)											
Nominal GDP (US$ millions)	472	449	443	435	422	443	462	485	506	617	752	917
Real GDP (percentage change)	0.9	-3.1	2.1	3.7	3.1	2.3	2.5	2.9	1.8	1.8	1.8	1.8
GDP deflator (percentage change)	2.4	0.5	1.0	1.5	1.1	0.9	1.6	3.0	3.0	2.5	2.5	2.5
Fiscal												
Total revenue and grants	27.4	25.2	27.5	28.2	27.3	27.4	28.6	28.8	29.7	28.9	28.6	28.5
Foreign grants	9.4	5.6	7.5	6.7	3.6	3.4	4.0	4.1	4.4	3.7	3.5	3.3
Total expenditure	30.2	26.5	25.7	29.3	30.4	29.1	29.5	29.6	29.8	29.3	28.6	28.5
Interest payments	0.8	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.6	0.5	0.5
Overall balance	-2.8	-1.3	1.7	-1.1	-3.1	-1.6	-0.8	-0.7	-0.2	-0.5	0.0	0.0
Primary balance	-1.9	-0.4	2.6	-0.2	-2.2	-0.8	0.0	0.0	0.6	0.2	0.5	0.4
Net domestic financing	-2.4	1.0	-2.0	0.5	1.7	0.4	-1.2	-0.1	-0.6	0.2	-1.3	-1.1
Net external financing	5.1	0.2	0.3	0.6	1.4	1.3	2.1	0.8	0.8	0.2	1.3	1.1
Balance of payments												
Exports of goods and services	18.9	21.5	18.5	17.5	18.4	18.2	18.9	19.6	20.4	19.2	19.6	20.1
Imports of goods and services	60.0	59.8	56.5	63.6	65.8	69.5	74.5	73.3	70.6	67.8	67.1	67.5
Workers' remittances	16.3	23.9	23.2	24.7	29.6	28.8	28.7	28.4	28.5	28.6	28.7	28.9
Current account	-12.4	-4.5	-7.9	-11.8	-3.1	-7.1	-10.5	-10.1	-6.2	-5.9	-6.9	-7.1
Net foreign direct investment	-0.3	1.2	2.6	2.7	2.8	2.9	2.9	2.9	2.9	3.1	3.2	3.3
Gross offical reserves	6.5	7.1	6.9	6.2	6.2	5.7	5.3	5.0	5.2	5.0	5.4	5.6
(In months of next year's goods and services import)												

Sources: Tonga authorities; and IMF staff estimates and projections.
1/ Data on fiscal year basis, with fiscal year beginning in July.

Table 2. Tonga: External Debt Sustainability Framework, Baseline Scenario, 2013–36 1/

(In percent of GDP, Unless Otherwise Indicated)

	Actual			Historical 6/	Standard 6/	Projections									
	2013.0	2014.0	2015.0	Average	Deviation							2016-2021			2022-2036
	2013	2014	2015			2016	2017	2018	2019	2020	2021	Average	2026	2036	Average
External debt (nominal) 1/	**45.3**	**42.1**	**44.2**			**43.1**	**42.4**	**43.2**	**41.9**	**41.0**	**39.6**		**34.0**	**32.4**	
of which: public and publicly guaranteed (PPG)	45.3	42.1	44.2			43.1	42.4	43.2	41.9	41.0	39.6		34.0	32.4	
Change in external debt	3.4	-3.1	2.1			-1.1	-0.7	0.8	-1.3	-0.9	-1.4		-1.1	-0.2	
Identified net debt-creating flows	5.5	5.9	9.9			-1.1	3.3	6.5	6.0	2.5	3.2		2.0	3.3	
Non-interest current account deficit	**3.9**	**7.2**	**11.1**	**11.1**	**6.4**	**2.4**	**6.4**	**9.8**	**9.4**	**5.5**	**6.2**		**5.3**	**7.0**	6.1
Deficit in balance of goods and services	38.3	38.0	46.1			47.4	51.3	55.6	53.7	50.2	50.2		48.3	47.5	
Exports	21.5	18.5	17.5			18.4	18.2	18.9	19.6	20.4	18.9		19.3	20.2	
Imports	59.8	56.5	63.6			65.8	69.5	74.5	73.3	70.6	69.1		67.6	67.7	
Net current transfers (negative = inflow)	-31.2	-29.0	-33.2	-28.1	3.6	-43.4	-43.2	-43.9	-42.3	-42.7	-42.1		-41.8	-40.2	-41.0
of which: official	-6.3	-4.0	-4.9			-9.1	-9.9	-10.7	-9.5	-9.9	-9.2		-8.8	-8.5	
Other current account flows (negative = net inflow)	-3.2	-1.8	-1.7			-1.6	-1.7	-1.9	-2.0	-1.9	-1.9		-1.1	-0.3	
Net FDI (negative = inflow)	**-1.2**	**-2.6**	**-2.7**	**-4.1**	**6.1**	**-2.8**	**-2.9**	**-2.9**	**-2.9**	**-2.9**	**-2.9**		**-3.1**	**-3.5**	-3.2
Endogenous debt dynamics 2/	**2.8**	**1.4**	**1.5**			**-0.7**	**-0.3**	**-0.4**	**-0.5**	**-0.1**	**-0.1**		**-0.2**	**-0.3**	
Contribution from nominal interest rate	0.7	0.7	0.7			0.8	0.7	0.7	0.7	0.6	0.6		0.4	0.3	
Contribution from real GDP growth	1.4	-1.0	-1.6			-1.4	-1.0	-1.0	-1.2	-0.7	-0.7		-0.6	-0.6	
Contribution from price and exchange rate changes	0.8	1.6	2.4			...	...	...	...	...	...		...	...	
Residual (3-4) 3/	**-2.1**	**-9.1**	**-7.8**			**0.0**	**-3.9**	**-5.8**	**-7.3**	**-3.4**	**-4.6**		**-3.1**	**-3.5**	
of which: exceptional financing	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
PV of external debt 4/	...	...	34.1			33.2	32.8	33.3	31.8	30.4	28.6		21.3	19.1	
In percent of exports	...	...	194.6			180.9	180.0	175.8	162.5	149.1	151.6		110.6	94.6	
PV of PPG external debt	**...**	**...**	**34.1**			**33.2**	**32.8**	**33.3**	**31.8**	**30.4**	**28.6**		**21.3**	**19.1**	
In percent of exports	**...**	**...**	**194.6**			**180.9**	**180.0**	**175.8**	**162.5**	**149.1**	**151.6**		**110.6**	**94.6**	
In percent of government revenues	**...**	**...**	**159.0**			**140.2**	**136.3**	**135.0**	**128.5**	**120.6**	**113.1**		**85.0**	**76.1**	
Debt service-to-exports ratio (in percent)	**7.5**	**9.2**	**9.8**			**9.4**	**8.8**	**7.7**	**14.6**	**15.8**	**18.8**		**14.9**	**5.9**	
PPG debt service-to-exports ratio (in percent)	**7.5**	**9.2**	**9.8**			**9.4**	**8.8**	**7.7**	**14.6**	**15.8**	**18.8**		**14.9**	**5.9**	
PPG debt service-to-revenue ratio (in percent)	**8.2**	**8.5**	**8.0**			**7.3**	**6.7**	**5.9**	**11.5**	**12.8**	**14.0**		**11.5**	**4.7**	
Total gross financing need (Millions of U.S. dollars)	19.3	27.8	44.1			5.3	22.9	38.6	45.5	29.5	35.9		32.8	45.2	
Non-interest current account deficit that stabilizes debt ratio	0.4	10.3	9.0			3.5	7.1	9.0	10.7	6.4	7.6		6.4	7.3	
Key macroeconomic assumptions															
Real GDP growth (in percent)	-3.1	2.1	3.7	1.0	2.8	3.1	2.3	2.5	2.9	1.8	1.8	2.4	1.8	1.8	1.8
GDP deflator in US dollar terms (change in percent)	-1.8	-3.4	-5.3	4.5	9.0	-6.0	2.4	1.8	2.2	2.3	2.3	0.8	2.2	2.2	2.2
Effective interest rate (percent) 5/	1.6	1.6	1.6	1.7	0.6	1.7	1.6	1.6	1.6	1.6	1.5	1.6	1.2	0.9	1.1
Growth of exports of G&S (US dollar terms, in percent)	8.6	-15.2	-7.0	9.4	26.9	1.7	3.8	8.5	8.7	8.6	-3.6	4.6	4.5	4.5	4.5
Growth of imports of G&S (US dollar terms, in percent)	-5.1	-6.9	10.5	7.5	8.6	0.3	10.8	11.8	3.4	0.3	1.9	4.8	3.8	4.4	3.9
Grant element of new public sector borrowing (in percent)	...	...	...	...	...	52.3	52.3	52.3	52.3	52.3	52.3	52.3	52.3	52.3	52.3
Government revenues (excluding grants, in percent of GDP)	19.6	20.0	21.4			23.7	24.1	24.6	24.7	25.2	25.3		25.1	25.1	25.1
Aid flows (in Millions of US dollars) 7/	25.2	33.1	29.3			15.1	14.9	18.4	19.9	22.4	22.4		23.5	31.6	
of which: Grants	25.2	33.1	29.3			15.1	14.9	18.4	19.9	22.4	22.4		23.5	31.6	
of which: Concessional loans	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Grant-equivalent financing (in percent of GDP) 8/	...	...	...			4.8	4.5	5.5	5.7	6.2	6.0		5.1	4.3	4.9
Grant-equivalent financing (in percent of external financing) 8/	...	...	...			81.0	81.1	80.0	79.7	79.2	79.2		79.5	82.3	80.5
Memorandum items:															
Nominal GDP (Millions of US dollars)	449.5	443.4	435.4			422.3	442.5	461.9	485.5	505.5	526.6		641.5	953.8	
Nominal dollar GDP growth	-4.8	-1.4	-1.8			-3.0	4.8	4.4	5.1	4.1	4.2	3.3	4.0	4.0	4.0
PV of PPG external debt (in Millions of US dollars)			137.1			141.4	146.1	152.9	153.8	153.4	150.6		136.6	182.1	
(PVt-PVt-1)/GDPt-1 (in percent)						1.0	1.1	1.6	0.2	-0.1	-0.6	0.5	-0.5	0.7	0.2
Gross workers' remittances (Millions of US dollars)	107.4	102.7	107.7			125.1	127.4	132.4	137.7	143.8	149.8		183.6	275.6	
PV of PPG external debt (in percent of GDP + remittances)	...	...	27.3			25.6	25.4	25.8	24.8	23.7	22.3		16.6	14.8	
PV of PPG external debt (in percent of exports + remittances)	...	...	80.7			69.2	69.7	69.9	66.3	62.3	60.5		44.5	38.9	
Debt service of PPG external debt (in percent of exports + remittances)	...	...	4.1			3.6	3.4	3.1	6.0	6.6	7.5		6.0	2.4	

Sources: Country authorities; and staff estimates and projections.

1/ Includes both public and private sector external debt.

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

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

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

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

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

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

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

Table 3. Tonga: Sensitivity Analysis for Key Indicators of Public and Publicly Guaranteed External Debt, 2016–36

(In percent)

	Projections							
	2016	2017	2018	2019	2020	2021	**2026**	2036
PV of debt-to-GDP+remittances ratio								
Baseline	26	25	26	25	24	22	**17**	15
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2016-2036 1/	26	25	24	21	20	18	**12**	10
A2. New public sector loans on less favorable terms in 2016-2036 2	26	26	27	26	26	25	**23**	25
A3. Costs of SPG + natural disasters	26	26	29	31	31	30	27	24
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2017-2018	26	26	27	26	25	24	**18**	16
B2. Export value growth at historical average minus one standard deviation in 2017-2018 3/	26	27	30	29	28	27	**21**	17
B3. US dollar GDP deflator at historical average minus one standard deviation in 2017-2018	26	27	28	27	26	25	**18**	16
B4. Net non-debt creating flows at historical average minus one standard deviation in 2017-2018 4/	26	38	49	43	42	41	**35**	24
B5. Combination of B1-B4 using one-half standard deviation shocks	26	39	52	45	44	42	**36**	25
B6. One-time 30 percent nominal depreciation relative to the baseline in 2017 5/	26	33	33	32	31	29	**21**	19
PV of debt-to-exports+remittances ratio								
Baseline	69	70	70	66	62	60	**45**	39
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2016-2036 1/	69	69	64	57	53	50	**35**	30
A2. New public sector loans on less favorable terms in 2016-2036 2	69	72	73	71	69	69	**61**	66
A3. Costs of SPG + natural disasters	68	73	77	83	80	87	71	62
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2017-2018	69	70	70	66	62	60	**44**	39
B2. Export value growth at historical average minus one standard deviation in 2017-2018 3/	69	81	96	93	88	86	**66**	53
B3. US dollar GDP deflator at historical average minus one standard deviation in 2017-2018	69	70	70	66	62	60	**44**	39
B4. Net non-debt creating flows at historical average minus one standard deviation in 2017-2018 4/	69	129	163	115	110	110	**93**	63
B5. Combination of B1-B4 using one-half standard deviation shocks	69	127	172	116	111	110	**93**	63
B6. One-time 30 percent nominal depreciation relative to the baseline in 2017 5/	69	70	70	66	62	60	**44**	39
PV of debt-to-revenue ratio								
Baseline	140	136	135	128	121	113	**85**	76
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2016-2036 1/	140	134	123	109	100	91	**61**	50
A2. New public sector loans on less favorable terms in 2016-2036 2	140	140	140	137	133	129	**116**	129
A3. Costs of SPG + natural disasters	141	142	155	166	161	156	**142**	128
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2017-2018	140	143	146	139	131	123	**92**	83
B2. Export value growth at historical average minus one standard deviation in 2017-2018 3/	140	145	157	150	142	135	**107**	87
B3. US dollar GDP deflator at historical average minus one standard deviation in 2017-2018	140	147	154	146	137	129	**97**	87
B4. Net non-debt creating flows at historical average minus one standard deviation in 2017-2018 4/	140	186	231	223	214	206	**177**	123
B5. Combination of B1-B4 using one-half standard deviation shocks	140	191	252	244	233	225	**193**	134
B6. One-time 30 percent nominal depreciation relative to the baseline in 2017 5/	140	194	190	181	170	160	**120**	107

Table 3. Tonga: Sensitivity Analysis for Key Indicators of Public and Publicly Guaranteed External Debt, 2016–36 (Continued)
(In percent)

	Projections							
	2016	2017	2018	2019	2020	2021	2026	2036
Debt service-to-exports+remittances ratio								
Baseline	4	3	3	6	7	8	**6**	2
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2016-2036 1/	4	3	3	6	6	7	**6**	2
A2. New public sector loans on less favorable terms in 2016-2036 2	4	3	3	6	7	8	**7**	4
A3. Costs of SPG + natural disasters	4	3	3	6	7	8	8	5
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2017-2018	4	3	3	6	7	8	**6**	2
B2. Export value growth at historical average minus one standard deviation in 2017-2018 3/	4	4	4	7	8	9	**8**	4
B3. US dollar GDP deflator at historical average minus one standard deviation in 2017-2018	4	3	3	6	7	8	**6**	2
B4. Net non-debt creating flows at historical average minus one standard deviation in 2017-2018 4/	4	5	5	7	7	8	**8**	5
B5. Combination of B1-B4 using one-half standard deviation shocks	4	5	5	7	7	8	**8**	5
B6. One-time 30 percent nominal depreciation relative to the baseline in 2017 5/	4	3	3	6	7	8	**6**	2
Debt service-to-revenue ratio								
Baseline	7	7	6	12	13	14	**11**	5
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2016-2036 1/	7	7	6	11	12	13	**10**	3
A2. New public sector loans on less favorable terms in 2016-2036 2	7	7	6	12	13	15	**14**	8
A3. Costs of SPG + natural disasters	7	7	6	12	14	15	**16**	11
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2017-2018	7	7	6	13	14	15	**12**	5
B2. Export value growth at historical average minus one standard deviation in 2017-2018 3/	7	7	6	12	13	14	**12**	6
B3. US dollar GDP deflator at historical average minus one standard deviation in 2017-2018	7	7	7	13	15	16	**13**	5
B4. Net non-debt creating flows at historical average minus one standard deviation in 2017-2018 4/	7	7	7	13	14	16	**15**	9
B5. Combination of B1-B4 using one-half standard deviation shocks	7	7	7	14	16	17	**17**	10
B6. One-time 30 percent nominal depreciation relative to the baseline in 2017 5/	7	9	8	16	18	20	**16**	7
Memorandum item:								
Grant element assumed on residual financing (i.e., financing required above baseline) 6/	50	50	50	50	50	50	**50**	50

Sources: Country authorities; and staff estimates and projections.

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

Table 4. Tonga: Public Sector Debt Sustainability Framework, Baseline Scenario, 2013–36

(In percent of GDP, Unless Otherwise Indicated)

	Actual			Average 5/	Standard Deviation 5/	Estimate	Projections								
	2013	2014	2015			2016	2017	2018	2019	2020	2021	2016-21 Average	2026	2036	2022-36 Average
Public sector debt 1/	51.4	45.8	49.0			48.7	48.2	48.7	47.1	46.0	44.4		38.1	35.2	
of which: foreign-currency denominated	45.3	42.1	44.2			43.1	42.4	43.2	41.9	41.0	39.6		34.0	32.4	
Change in public sector debt	2.7	-5.5	3.2			-0.3	-0.5	0.5	-1.6	-1.1	-1.6		-1.2	-0.3	
Identified debt-creating flows	3.4	-3.3	6.4			0.5	-0.5	-0.7	-1.7	-1.7	-1.8		-1.3	-1.2	
Primary deficit	0.4	-2.6	0.2	0.8	2.9	2.2	0.8	0.0	-0.1	-0.6	-0.6	0.3	-0.3	-0.1	-0.4
Revenue and grants	25.2	27.5	28.2			27.3	27.4	28.6	28.8	29.7	29.6		28.8	28.5	
of which: grants	5.6	7.5	6.7			3.6	3.4	4.0	4.1	4.4	4.2		3.7	3.3	
Primary (noninterest) expenditure	25.6	24.9	28.4			29.5	28.2	28.6	28.8	29.1	29.0		28.5	28.3	
Automatic debt dynamics	4.0	-1.4	5.7			-1.8	-1.3	-0.7	-1.6	-1.1	-1.2		-1.0	-1.0	
Contribution from interest rate/growth differential	1.7	-0.9	-1.4			-1.1	-0.8	-1.2	-1.6	-1.0	-1.0		-1.0	-1.0	
of which: contribution from average real interest rate	0.1	0.1	0.2			0.4	0.3	0.0	-0.2	-0.2	-0.2		-0.3	-0.3	
of which: contribution from real GDP growth	1.6	-1.0	-1.6			-1.5	-1.1	-1.2	-1.4	-0.8	-0.8		-0.7	-0.6	
Contribution from real exchange rate depreciation	2.3	-0.5	7.1			-0.7	-0.5	0.4	-0.1	-0.1	-0.2		...	...	
Other identified debt-creating flows	-0.9	0.8	0.5			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Privatization receipts (negative)	0.0	0.8	0.5			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Recognition of implicit or contingent liabilities	-0.9	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	-0.7	-2.2	-3.3			-0.8	-0.1	1.2	0.1	0.6	0.2		0.1	0.8	
Other Sustainability Indicators															
PV of public sector debt	...	...	38.9			38.8	38.5	38.8	37.0	35.4	33.4		25.5	21.9	
of which: foreign-currency denominated	...	...	34.1			33.2	32.8	33.3	31.8	30.4	28.6		21.3	19.1	
of which: external	...	...	34.1			33.2	32.8	33.3	31.8	30.4	28.6		21.3	19.1	
PV of contingent liabilities (not included in public sector debt)	...	...	...			...	...	...	...	...	...		...	...	
Gross financing need 2/	3.2	0.0	2.9			4.8	3.5	2.2	3.6	4.5	4.5		3.8	1.9	
PV of public sector debt-to-revenue and grants ratio (in percent)	...	...	138.1			142.2	140.5	135.5	128.3	119.4	112.9		88.5	77.0	
PV of public sector debt-to-revenue ratio (in percent)	...	...	181.5			163.7	160.2	157.4	149.5	140.3	131.8		101.4	87.2	
of which: external 3/	...	...	159.0			140.2	136.3	135.0	128.5	120.6	113.1		85.0	76.1	
Debt service-to-revenue and grants ratio (in percent) 4/	11.1	9.6	9.4			9.6	9.7	7.5	12.5	17.0	17.1		14.3	7.1	
Debt service-to-revenue ratio (in percent) 4/	14.3	13.1	12.4			11.1	11.1	8.7	14.6	20.0	20.0		16.3	8.0	
Primary deficit that stabilizes the debt-to-GDP ratio	-2.3	2.9	-2.9			2.6	1.3	-0.5	1.6	0.5	1.0		0.9	0.2	
Key macroeconomic and fiscal assumptions															
Real GDP growth (in percent)	-3.1	2.1	3.7	1.0	2.8	3.1	2.3	2.5	2.9	1.8	1.8	2.4	1.8	1.8	1.8
Average nominal interest rate on forex debt (in percent)	1.6	1.6	1.6	1.7	0.6	1.7	1.6	1.6	1.6	1.6	1.5	1.6	1.2	0.9	1.1
Average real interest rate on domestic debt (in percent)	2.8	1.9	2.8	-1.0	4.8	2.9	2.6	1.4	0.0	0.0	0.2	1.2	0.5	0.5	0.5
Real exchange rate depreciation (in percent, + indicates depreciation)	5.3	-1.1	17.4	-0.9	10.6	-1.6	...	...	...	...	...	...	...	...	...
Inflation rate (GDP deflator, in percent)	0.5	1.0	1.5	4.3	5.4	1.1	0.9	1.6	3.0	3.0	2.7	2.0	2.5	2.5	2.5
Growth of real primary spending (deflated by GDP deflator, in percent)	-15.6	-0.9	18.5	0.2	8.1	7.1	-2.2	4.1	3.4	2.8	1.4	2.8	0.8	2.5	1.7
Grant element of new external borrowing (in percent)	...	...	...	...	...	52.3	52.3	52.3	52.3	52.3	52.3	52.3	52.3	52.3	...

Sources: Country authorities; and staff estimates and projections.

1/ Central government; gross 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 excluding grants.

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

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

Table 5. Tonga: Sensitivity Analysis for Key Indicators of Public Debt 2016–36

		Projections						
	2016	2017	2018	2019	2020	2021	2026	2036
PV of Debt-to-GDP Ratio								
Baseline	39	39	39	37	35	33	25	22
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	39	39	40	40	39	38	34	38
A2. Primary balance is unchanged from 2016	39	39	41	40	40	39	38	46
A3. Permanently lower GDP growth 1/	39	39	39	38	37	36	31	42
A4. High Wage Growth	39	38	39	39	39	39	55	159
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2017-2018	39	41	44	43	43	41	38	44
B2. Primary balance is at historical average minus one standard deviations in 2017-2018	39	40	42	41	39	37	29	24
B3. Combination of B1-B2 using one half standard deviation shocks	39	40	43	42	41	39	35	37
B4. One-time 30 percent real depreciation in 2017	39	52	52	49	46	43	30	24
B5. 10 percent of GDP increase in other debt-creating flows in 2017	39	44	44	42	41	38	30	26
PV of Debt-to-Revenue Ratio 2/								
Baseline	142	141	136	128	119	113	89	77
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	142	142	140	137	131	127	116	131
A2. Primary balance is unchanged from 2016	142	143	142	139	135	133	132	160
A3. Permanently lower GDP growth 1/	142	142	138	132	125	120	109	144
A4. High Wage Growth	142	140	137	134	131	134	193	558
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2017-2018	142	148	152	148	141	138	132	153
B2. Primary balance is at historical average minus one standard deviations in 2017-2018	142	146	148	141	131	124	100	86
B3. Combination of B1-B2 using one half standard deviation shocks	142	147	149	144	137	132	120	129
B4. One-time 30 percent real depreciation in 2017	142	190	181	169	155	145	105	83
B5. 10 percent of GDP increase in other debt-creating flows in 2017	142	160	154	146	137	130	106	90
Debt Service-to-Revenue Ratio 2/								
Baseline	10	10	8	13	17	17	14	7
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	10	10	8	13	18	18	16	11
A2. Primary balance is unchanged from 2016	10	10	8	13	18	18	16	12
A3. Permanently lower GDP growth 1/	10	10	8	13	17	18	16	11
A4. High Wage Growth	10	10	7	12	17	18	34	127
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2017-2018	10	10	8	14	19	19	17	11
B2. Primary balance is at historical average minus one standard deviations in 2017-2018	10	10	8	13	18	18	14	8
B3. Combination of B1-B2 using one half standard deviation shocks	10	10	8	13	18	19	16	10
B4. One-time 30 percent real depreciation in 2017	10	11	10	17	22	22	19	10
B5. 10 percent of GDP increase in other debt-creating flows in 2017	10	10	8	14	18	18	15	8

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.