INTERNATIONAL MONETARY FUND

SAMOA

STAFF REPORT FOR THE 2017 ARTICLE IV CONSULTATION—DEBT SUSTAINABILITY ANALYSIS

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Prepared by the staffs of the International Monetary Fund (IMF) and the International Development Association (IDA)[1]

The update of the DSA shows that under current policies Samoa faces a high risk of debt distress, based on an assessment of public external debt. In the 2015 Article IV report, Samoa was assessed as moderate risk of debt distress. The change in the assessment is driven by a change in methodology to take into account the impact of natural disasters both in the near term and over the medium-to-long term. In the near term, the impact of a natural disaster shock is assessed. The change in methodology is to incorporate the average annual impacts of natural disasters on growth and on fiscal and external debt. The impact of natural disasters has a significant impact of debt dynamics, emphasizing that the government will need to maintain its medium-term and long-term fiscal debt targets (of 50 percent of GDP and 40 percent of GDP respectively) to keep its debt burden manageable. Samoa faces a heightened overall risk of public debt distress, reflecting contingent liabilities from government guarantees and on-lending to public enterprises from public financial institutions (PFIs). Structural reforms to reduce the impact of natural disasters on average growth rates can also contribute to debt sustainability.

[1] This 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 the IDA. Samoa is rated as a strong performer for its policies and institutions for the purposes of the IMF-World Bank low-income country DSA framework. The DSA uses a 5 percent discount rate.

BACKGROUND

1. Rapid fiscal expansion and borrowing following the global financial crisis and natural disasters in 2009 and 2012 have left Samoa with a large stock of debt. The 2015/16 fiscal deficit outturn of 0.4 percent of GDP has helped alleviate risks from elevated debt, however, Samoa's vulnerability to natural disasters entails significant costs. The recovery efforts and reconstruction required after the 2009 tsunami and 2012 cyclone were largely financed by borrowing and total public debt increased to 57.8 percent of GDP at end-2015 which was well above the government's threshold of 50 percent.

2. The risk rating is increased to high, reflecting the potential impact of natural disasters on Samoa's fiscal position over the medium term. Following the methodology outlined in the 2016 IMF Board Paper on "Small States' Resilience to Natural Disasters and Climate Change" the medium-term projections are adjusted to account for the average impact of natural disasters on growth and the fiscal and current account deficits. These adjustments have a significant impact on the debt-dynamics.

3. The 2015 DSA lowered the risk rating for debt distress for Samoa from high to moderate, reflecting an increase in the discount rate and rebasing of GDP.[2] The assessment of moderate debt distress was based on the external debt assessment. However, the overall risk of public debt distress was found to be higher, due to contingent liabilities. The conclusions emphasized the importance for the authorities to adhere to consolidation plans to reach their debt target.

4. Although Samoa's debt service is low relative to projected foreign reserves and government revenue, debt service requirements have increased significantly in recent years. Much of Samoa's debt is long-term and concessional, with approximately 60 percent owed to multilateral agencies and 40 percent to bilateral partners. Total debt service requirements are projected to increase over the next few years to about 2.7 percent of GDP, due largely to increasing principal repayments.

5. The central government's net domestic debt is small, but domestic liabilities in SOEs pose a potential risk. The government issues guarantees to its SOEs, and has five on-lending arrangements active with the Electric Power Corporation (EPC), Development Bank of Samoa (DBS) and Unit Trust of Samoa (UTOS) as of end-2015, posing some risk for the government, given the relatively poor financial performance of many of Samoa's SOEs.

METHODOLOGY AND ASSUMPTIONS

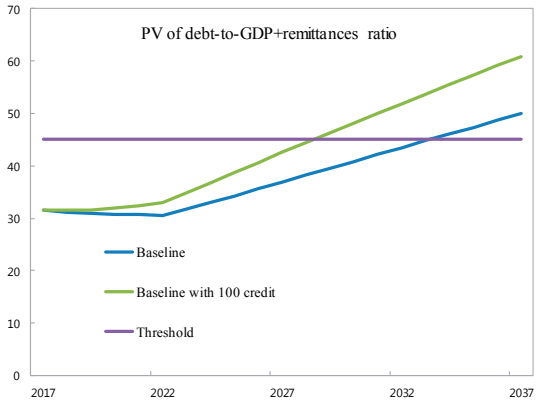
6. Debt sustainability is assessed in relation to indicative group-specific debt burden thresholds that depend on the quality of policies and institutions. Having established a strong track record of sound macroeconomic management, Samoa has one of the highest Country Policy and

[2] GDP data were revised to 2009 prices (previously 2002) and the coverage widened through new censuses and surveys, increasing nominal GDP from SAT1.6billion to SAT1.8billion in 2012/13.

Institutional Assessment (CPIA) ratings among the Bank's Pacific Island member states. Samoa's debt is therefore assessed against higher thresholds.[3]

7. The underlying assumptions are consistent with the macroeconomic framework, based on updated data provided by the authorities, and estimates by staff.[4]

- **Real GDP growth** is projected at 2.1 percent on average over 2017-2022, in the baseline scenario, which assumes no natural disasters. To account for the average impact of natural disasters, the growth rate is lowered by 1.3 percentage points after 2022.
- **Inflation** remains subdued and is expected to stabilize at around 3 percent over the medium term.
- **The current account** widened to -6.1 percent in FY2015/2016 due to a deterioration of the income account and lower charitable remittances but the deficit is projected to remain below 5 percent of GDP between 2017-2022, in the baseline scenario. To account for the average annual impact of natural disasters, the deficit is widened by 1.5 percentage points after 2022.
- **The primary fiscal balance** is estimated to be in balance between 2017-2022 but widens by 1.5 percentage points after 2022 to account for the average annual impact of natural disasters.
- **New external borrowing will be required to finance the fiscal deficit.** Continued eligibility for concessional borrowing from multilateral development partners is assumed for the forecast period. The grant element of new loans is 40 percent on average. Alternatively, if it is assumed that borrowing from the World Bank is at full credit terms, then the breach in the threshold occurs about 5 years earlier in 2028. (see text chart).



- **Contingent liabilities related to SOEs and PFIS** are estimated at 18.8 percent of GDP (government guarantees of 8.8 percent and on-lending to SOEs of 10 percent).

[3] Samoa's CPIA rating for 2015 is 4.0.

[4] The 5 percent discount rate used to calculate the net present value (NPV) of external debt.

INCORPORATING THE IMPACT OF NATURAL DISASTERS

8. Samoa is ranked as the most vulnerable to natural disasters among small states in the 2016 IMF Board Paper on "Small States' Resilience to Natural Disasters and Climate Change" The probability of Samoa being struck by a natural disaster is about average for Pacific island countries with a probability of about 25 percent each year.[5] However, the annual average damage and losses (**estimated** at over 12 percent of GDP) are by far the highest in the region. Cyclone Evan, the most recent Category 5 cyclone to hit Samoa, caused total damage and losses of approximately US$210 million (about 30 percent of annual GDP). The combination of both high frequency and extreme impact leads to Samoa's ranking as the most vulnerable small state.

Samoa: Vulnerability to Natural Disasters

	1990-2014		1950-2014
	Probability of Disaster in a Year	Average Annual Damage	Ranking by Vulnerability 1/
	(in percent)	(in percent of GDP)	
Samoa	**24.4**	**12.36**	**1**
Vanuatu	64.7	0.12	4
Tonga	30.2	1.62	11
Solomon Is	53.2	0.08	14
Fiji	66.0	0.67	19
Micronesia Fed States	24.4	0.01	20

1/ IMF staff calculations, combining rankings on the frequency of disasters and effects of those disasters.
Source: IMF Board Paper 2016 "Small States' Resilience to Natural Disasters and Climate Change: Role for the

9. The findings of the substantial literature on the macroeconomic impact of natural disasters findings are mixed.[6] There is a clear temporary negative impact on growth although estimates vary. Laframboise and Boileau (2012) estimate that a country's growth drops by an average 0.7 percent in the first year after a disaster, with a cumulative output loss three years after the disaster of about 1.5 percent over and above the immediate direct losses, and a drop in per capita real GDP of 1 percent on average in low-income countries.[7] Lee et al (2017) estimated that on average for the pacific islands, the growth rate declines by 4 percent in the disaster year, with a further decline of 0.5 percent in the following year.[8] Cabezon *et al* found that for the Pacific islands, trend growth over 1980-2014 was 0.7 percentage point

[5] The probability of a natural disaster averages around 24 percent for Pacific island countries. For details, refer to Cabezon *et al,* 2015, "Enhancing Macroeconomic Resilience to Natural Disasters and Climate Change in the Small States of the Pacific" WP/15/125.

[6] See 2016 Board paper for further discussion.

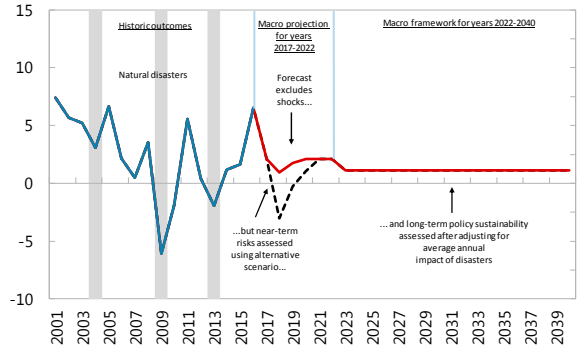
[7] Laframboise and Boileau, 2012, "Natural Disasters: Mitigating Impact, Managing Risks," WP 12/245.

[8] Lee, Dongyeol, Patrizia Tumbarello, Kazuaki Washimi and Tlek Zeinullayev, 2017, "Mind the Gap: Public Investment, Growth and Natural Disaster Risk in the Small States of the Pacific", IMF Working Paper, forthcoming.

lower than it would have been in the absence of natural disasters. Fiscal balances are also adversely affected. Lee et al estimate that natural disasters increase public debt by 14.4 percent on average in the disaster year. Synthetic control analysis suggests that the 2009 tsunami increased Samoa's public debt by 10 percent of GDP and the 2012 cyclone increased debt by a further 5 percent.[9]

10. These major long-term costs and risks are incorporated into the DSA to assess how they impact a countries' fiscal position and external debt sustainability. Accordingly, the baseline scenario considers the impact of future natural disasters, in line with the 2016 Board Paper on Small States' Resilience to Natural Disasters and Climate Change. From 2016-2022, staff's projections assume no natural disasters. This ensures that adjustments for natural disasters do not complicate the near-term policy discussions. However, this is not a realistic assumption over a longer horizon. Therefore, the baseline projections after 2022 take into account the average annual impact of natural disasters by adjusting downwards the average growth rate and increasing the current account and fiscal deficits. This approach is illustrated in the text figure. Given the high frequency and severity of natural disasters in Samoa, the average growth rate was adjusted down by 1.3 percent (to 0.8 percent compared with a non-disaster potential growth rate of 2.1 percent and the historical average of 0.9 percent) and the current account and fiscal deficits are estimated to widen by 1.5 percentage points.

Growth Projections with Disaster Impacts for DSA Analysis
(In percent)



Sources: Country authorities; and IMF staff calculations.

EXTERNAL DEBT SUSTAINABILITY ANALYSIS

11. In the baseline scenario the external debt-to-GDP+remittances ratio increases to over 46 percent by 2034, breaching the indicative threshold. By the end of the sample is 11.1 by 2037 percentage points above the threshold. In the baseline scenario, the average growth rate is 0.8 percent after 2022, compared with an historical average of 0.9 percent. On average, growth is expected to be lower than historically due to the expected increased severity of natural disasters. The deviation of the baseline from the historical scenario primarily reflects a lower projected change in the GDP deflator in U.S. dollar terms.[10] Though Samoa has historically implemented sound macroeconomic policies and reforms that have resulted in strong growth, the effects of natural disasters have reduced Samoa's economic growth and contributed to a weaker fiscal position.

12. Stress tests show Samoa's PV of debt-to-GDP and debt service-to-revenue ratios are vulnerable to exogenous shocks. There is a protracted and significant breach of the PV of debt to GDP

[9] IMF Samoa 2015 Article IV Staff Report.

[10] The historical scenario generates a new path of debt by freezing key macroeconomic variables at their 10-year historical average.

following a one-time depreciation shock (the most extreme shock scenario). Similarly, a severe natural disaster shock in 2018 leads to a breach of the PV of debt-to-GDP ratio after 2024

13. Measured by Samoa's debt service to revenue and debt service to exports ratios, Samoa's debt service burden increases significantly when the average impact of natural disasters is incorporated into the baseline. Samoa's debt service capacity is supported by foreign exchange earnings from the tourism industry, large inflows of remittances and revenue collection efforts. However, under the most extreme shock scenario, the threshold for both the debt service to exports is breached starting in 2027 and debt service to revenue ratio is breaches towards the end of the projection period. The debt service to revenue ratio also breaches the threshold following a one-time depreciation shock, but at the end of the projection horizon.

PUBLIC DEBT SUSTAINABILITY ANALYSIS

14. Public sector debt rises in the baseline scenario but is stable in the historical scenario. An extreme shock drives up the PV of debt to GDP and debt service to revenue ratios. The baseline includes government guarantees and on-lending to SOEs, of about 8.8 percent and 10 percent as a share of GDP respectively and these are added to the debt-to-GDP ratio in 2016. The extreme shock scenario leads to a sustained breach of the PV of debt-to-GDP ratio and a protracted elevation of the debt service to revenue ratio.

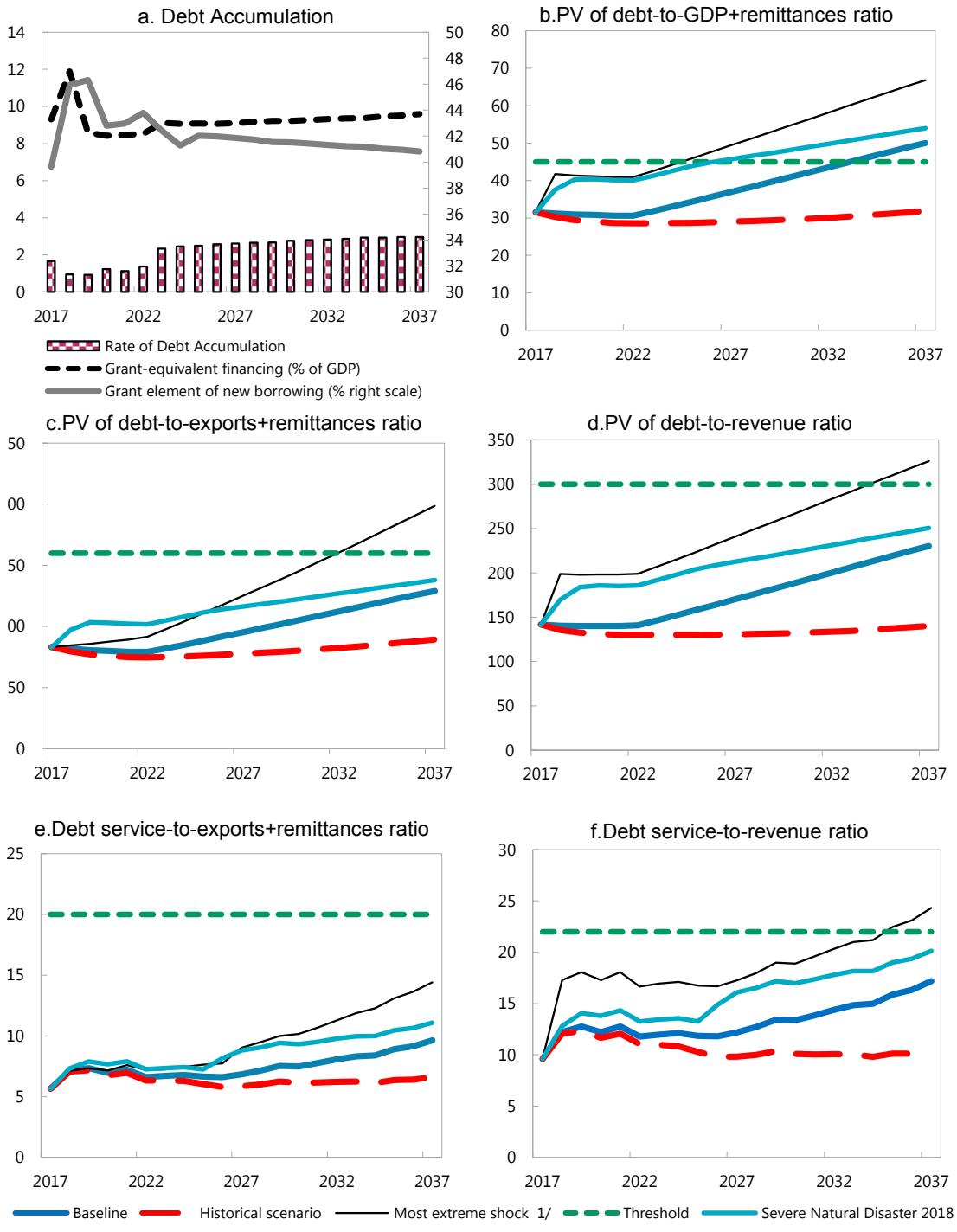
CONCLUSION

15. The DSA highlights the central role of fiscal policy. With the public debt portfolio dominated by external loans, exposure to foreign currency risk remains high. Moreover, should Samoa fail to consolidate its fiscal position and experience natural disasters, public debt would increase rapidly and become unsustainable, leading to a breach in the PV of debt-to-GDP ratio. Future external borrowing should be limited to loans with at least a 35 percent grant element, and that support projects with a return sufficient to cover the interest and repayment costs. Improving resilience to natural disasters and reform of SOEs can help reduce Samoa's debt burden and should be part of the overall debt management strategy.

Authorities' Views

16. The authorities recognize the risks posed by high debt levels and are committed to achieving their medium-term fiscal deficit targets to keep Samoa's debt burden manageable. With debt repayments rising, the government has put in place a credible fiscal consolidation plan and is committed to meeting the objectives of Samoa's medium-term debt management strategy by: i) restricting the level of public debt to less than 50 percent of GDP; ii) ensuring that loans contracted are highly concessional, with a grant element of at least 35 percent; and iii) effectively managing SOEs guarantees.

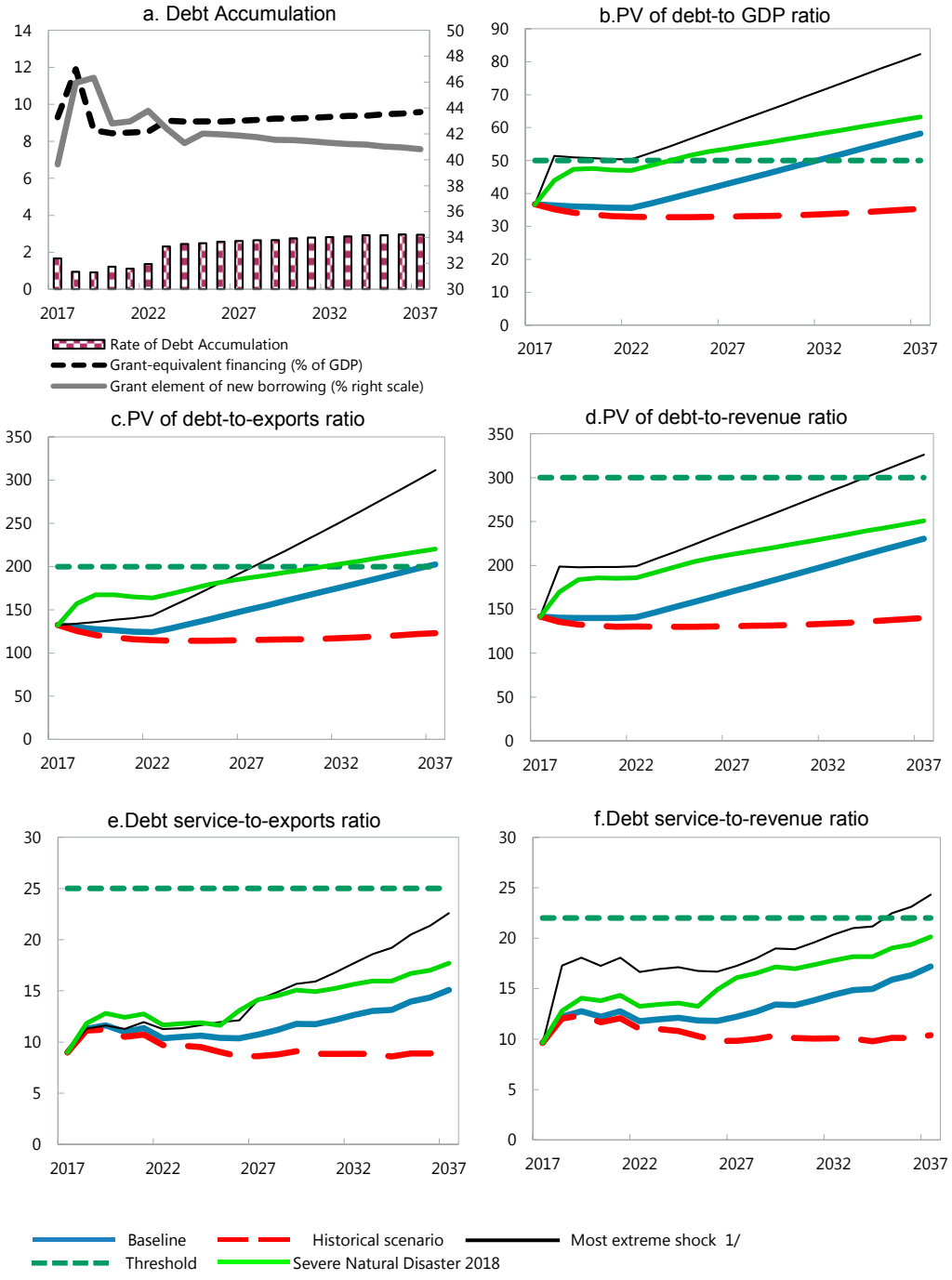
Figure 1a. Samoa: Indicators of Public and Publicly Guaranteed External Debt under Alternatives Scenarios, 2017-2037 1/



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 2027. In figure b. it corresponds to a One-time depreciation shock; in c. to a Terms shock; in d. to a One-time depreciation shock; in e. to a Terms shock and in figure f. to a One-time depreciation shock

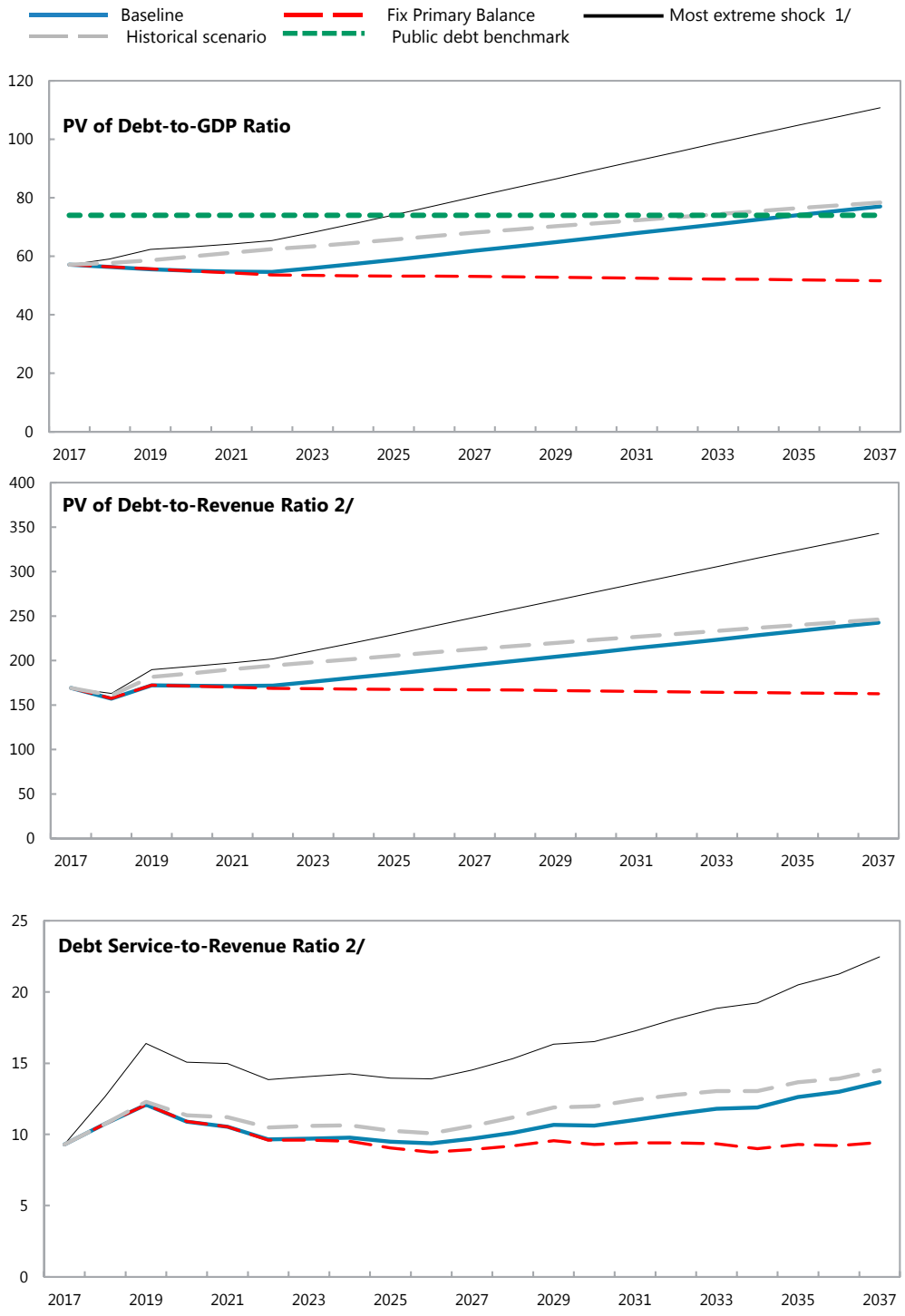
Figure 1b. Samoa: Indicators of Public and Publicly Guaranteed External Debt Under Alternatives Scenarios, Excluding Remittances 2017-20317 1/



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 2027. In figure b. it corresponds to a One-time depreciation shock; in c. to a Terms shock; in d. to a One-time depreciation shock; in e. to a Terms shock and in figure f. to a One-time depreciation shock

Figure 2. Samoa: Indicators of Public Debt under Alternative Scenarios, 2017-2037 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 2027.
2/ Revenues are defined inclusive of grants.

Table. 1a. Samoa: External Debt Sustainability Framework Baseline Scenario, 2014-2037 1/

(In percent of GPD, unless otherwise indicated)

	Actual			Historical Average 6/	Standard Deviation 6/	Projections									
	2014	2015	2016			2017	2018	2019	2020	2021	2022	2017-2022 Average	2027	2037	2023-2037 Average
External debt (nominal) 1/	**51.8**	**55.3**	**50.7**			**50.8**	**51.1**	**51.7**	**52.0**	**52.3**	**52.6**		**64.8**	**86.8**	
of which: public and publicly guaranteed (PPG)	51.8	55.3	50.7			50.8	51.1	51.7	52.0	52.3	52.6		64.8	86.8	
Change in external debt	0.2	3.6	-4.6			0.0	0.3	0.6	0.3	0.3	0.3		2.4	2.1	
Identified net debt-creating flows	6.2	-0.4	6.6			4.3	4.7	3.6	2.9	2.6	2.4		4.5	4.4	
Non-interest current account deficit	**7.4**	**2.3**	**5.3**	**5.5**	**2.6**	**5.2**	**4.9**	**4.1**	**3.8**	**3.6**	**3.6**		**5.0**	**4.8**	4.9
Deficit in balance of goods and services	24.6	21.2	20.5			20.5	20.3	19.7	19.2	18.8	18.5		20.0	20.0	
Exports	27.8	27.5	29.4			27.8	28.0	28.3	28.4	28.6	28.7		28.7	28.7	
Imports	52.5	48.7	49.9			48.3	48.3	48.0	47.6	47.4	47.2		48.7	48.7	
Net current transfers (negative = inflow)	-20.2	-20.2	-16.8	-20.1	1.9	-16.4	-16.5	-16.5	-16.5	-16.5	-16.3		-16.3	-16.3	-16.3
of which: official	-0.3	-0.2	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Other current account flows (negative = net inflow)	3.1	1.3	1.6			1.1	1.0	1.0	1.2	1.2	1.4		1.3	1.1	
Net FDI (negative = inflow)	**-2.0**	**-3.4**	**-0.8**	**-2.5**	**2.3**	**-0.8**	**-0.8**	**-0.8**	**-0.8**	**-0.8**	**-0.8**		**-0.8**	**-0.8**	-0.8
Endogenous debt dynamics 2/	**0.8**	**0.7**	**2.1**			**-0.1**	**0.5**	**0.2**	**-0.1**	**-0.2**	**-0.4**		**0.3**	**0.4**	
Contribution from nominal interest rate	0.7	0.7	0.8			0.9	1.0	1.1	0.9	0.9	0.7		0.8	1.0	
Contribution from real GDP growth	-0.6	-0.8	-3.7			-1.0	-0.5	-0.9	-1.0	-1.1	-1.1		-0.5	-0.6	
Contribution from price and exchange rate changes	0.7	0.8	5.0			...	...	...	...	...	...		...	...	
Residual (3-4) 3/	**-6.0**	**4.0**	**-11.2**			**-4.3**	**-4.3**	**-3.0**	**-2.6**	**-2.4**	**-2.1**		**-2.2**	**-2.3**	
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/	..	...	36.7			36.7	36.4	36.1	35.9	35.7	35.6		43.0	58.2	
In percent of exports	...	...	125.0			132.3	129.8	127.5	126.2	124.7	124.0		149.5	202.4	
PV of PPG external debt	**...**	**...**	**36.7**			**36.7**	**36.4**	**36.1**	**35.9**	**35.7**	**35.6**		**43.0**	**58.2**	
In percent of exports	**...**	**...**	**125.0**			**132.3**	**129.8**	**127.5**	**126.2**	**124.7**	**124.0**		**149.5**	**202.4**	
In percent of government revenues	**...**	**...**	**137.0**			**141.7**	**140.5**	**140.1**	**140.3**	**140.2**	**140.8**		**170.2**	**230.5**	
Debt service-to-exports ratio (in percent)	**2.4**	**2.5**	**2.6**			**9.0**	**11.3**	**11.6**	**11.0**	**11.4**	**10.4**		**10.7**	**15.1**	
PPG debt service-to-exports ratio (in percent)	**2.4**	**2.5**	**2.6**			**9.0**	**11.3**	**11.6**	**11.0**	**11.4**	**10.4**		**10.7**	**15.1**	
PPG debt service-to-revenue ratio (in percent)	**2.6**	**2.8**	**2.9**			**9.6**	**12.2**	**12.8**	**12.2**	**12.8**	**11.8**		**12.2**	**17.2**	
Total gross financing need (Millions of U.S. dollars)	49.1	-2.9	41.6			58.6	63.5	59.8	57.9	58.9	58.2		83.5	122.7	
Non-interest current account deficit that stabilizes debt ratio	7.2	-1.2	9.9			5.2	4.5	3.5	3.5	3.3	3.2		2.6	2.7	
Key macroeconomic assumptions															
Real GDP growth (in percent)	1.2	1.6	6.6	0.9	3.7	2.1	0.9	1.8	2.1	2.1	2.1	1.9	0.8	0.8	0.8
GDP deflator in US dollar terms (change in percent)	-1.3	-1.6	-8.3	4.0	8.2	5.1	2.4	1.6	1.7	1.6	1.8	2.4	1.8	1.8	1.8
Effective interest rate (percent) 5/	1.3	1.3	1.4	1.2	0.5	1.9	2.0	2.2	1.8	1.8	1.4	1.8	1.3	1.2	1.3
Growth of exports of G&S (US dollar terms, in percent)	-4.1	-1.2	4.5	4.6	7.4	1.4	4.3	4.4	4.4	4.4	4.4	3.9	2.5	2.5	2.6
Growth of imports of G&S (US dollar terms, in percent)	6.0	-7.1	0.1	4.2	8.8	3.8	3.6	2.6	3.1	3.4	3.5	3.3	2.5	2.5	2.8
Grant element of new public sector borrowing (in percent)	...	...	...	...	...	39.6	45.9	46.3	42.8	43.0	43.8	43.6	41.9	40.8	41.5
Government revenues (excluding grants, in percent of GDP)	25.4	25.3	26.8			25.9	25.9	25.7	25.6	25.4	25.3		25.2	25.2	25.2
Aid flows (in Millions of US dollars) 7/	101.5	78.5	52.5			65.9	86.6	58.7	60.9	63.2	65.7		74.6	96.0	
of which: Grants	101.5	78.5	52.5			65.9	86.6	58.7	60.9	63.2	65.7		74.6	96.0	
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/	..	...	...			9.3	11.9	8.6	8.4	8.5	8.5		9.1	9.6	9.3
Grant-equivalent financing (in percent of external financing) 8/	...	...	...			80.5	83.8	78.1	76.7	76.5	76.8		71.6	68.3	70.5
Memorandum items:															
Nominal GDP (Millions of US dollars)	803.6	804.0	785.9			843.2	871.5	901.2	935.7	971.0	1009.4		1145.5	1473.5	
Nominal dollar GDP growth	-0.2	0.0	-2.2			7.3	3.4	3.4	3.8	3.8	4.0	4.3	2.5	2.5	2.6
PV of PPG external debt (in Millions of US dollars)			296.0			309.1	317.0	324.9	335.9	346.3	359.6		492.0	857.0	
(PVt-PVt-1)/GDPt-1 (in percent)						1.7	0.9	0.9	1.2	1.1	1.4	1.2	2.6	3.0	2.7
Gross workers' remittances (Millions of US dollars)	160.0	160.9	131.7			138.1	143.3	148.8	154.4	159.4	164.6		186.8	240.3	
PV of PPG external debt (in percent of GDP + remittances)	...	...	31.4			31.6	31.2	30.9	30.8	30.6	30.6		36.9	50.0	
PV of PPG external debt (in percent of exports + remittances)	...	...	79.6			83.2	81.8	80.5	79.9	79.2	79.1		95.3	129.1	
Debt service of PPG external debt (in percent of exports + remittances)	...	...	1.7			5.6	7.1	7.3	7.0	7.2	6.6		6.8	9.6	

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 1b. Samoa: Sensitivity Analysis for Key Indicators of Public and Publicly Guaranteed External Debt, 2017-2037

(In percent)

	Projections							
	2017	2018	2019	2020	2021	2022	**2027**	2037
PV of debt-to-GDP+remittances ratio								
Baseline	32	31	31	31	31	31	**37**	50
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2017-2037 1/	32	30	29	29	29	29	**29**	32
A2. New public sector loans on less favorable terms in 2017-2037 2	32	32	33	34	35	35	**48**	77
A3. Alternative Scenario: Severe Natural Disaster in 2018	31	38	40	40	40	40	**46**	54
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2018-2019	32	32	33	33	33	33	**40**	54
B2. Export value growth at historical average minus one standard deviation in 2018-2019 3/	32	32	34	34	34	34	**40**	51
B3. US dollar GDP deflator at historical average minus one standard deviation in 2018-2019	32	33	34	34	34	34	**41**	56
B4. Net non-debt creating flows at historical average minus one standard deviation in 2018-2019 4/	32	30	29	30	29	29	**36**	50
B5. Combination of B1-B4 using one-half standard deviation shocks	32	31	32	32	32	32	**39**	53
B6. One-time 30 percent nominal depreciation relative to the baseline in 2018 5/	32	42	41	41	41	41	**49**	67
PV of debt-to-exports+remittances ratio								
Baseline	83	82	80	80	79	79	**95**	129
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2017-2037 1/	83	80	77	76	75	75	**78**	89
A2. New public sector loans on less favorable terms in 2017-2037 2	83	84	86	87	89	92	**125**	199
A3. Alternative Scenario: Severe Natural Disaster in 2018	83	97	103	103	102	102	116	138
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2018-2019	83	82	80	80	79	79	**95**	129
B2. Export value growth at historical average minus one standard deviation in 2018-2019 3/	83	88	96	95	95	95	**112**	145
B3. US dollar GDP deflator at historical average minus one standard deviation in 2018-2019	83	82	80	80	79	79	**95**	129
B4. Net non-debt creating flows at historical average minus one standard deviation in 2018-2019 4/	83	77	75	77	76	76	**92**	128
B5. Combination of B1-B4 using one-half standard deviation shocks	83	77	78	79	78	78	**95**	130
B6. One-time 30 percent nominal depreciation relative to the baseline in 2018 5/	83	82	80	80	79	79	**95**	129
PV of debt-to-revenue ratio								
Baseline	142	140	140	140	140	141	**170**	231
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2017-2037 1/	142	136	133	131	130	130	**131**	140
A2. New public sector loans on less favorable terms in 2017-2037 2	142	145	149	154	158	163	**223**	355
A3. Alternative Scenario: Severe Natural Disaster in 2018	141	170	184	186	185	186	**212**	251
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2018-2019	142	146	152	152	152	153	**185**	251
B2. Export value growth at historical average minus one standard deviation in 2018-2019 3/	142	145	153	153	153	154	**184**	237
B3. US dollar GDP deflator at historical average minus one standard deviation in 2018-2019	142	150	159	159	159	160	**193**	262
B4. Net non-debt creating flows at historical average minus one standard deviation in 2018-2019 4/	142	138	135	135	135	136	**165**	228
B5. Combination of B1-B4 using one-half standard deviation shocks	142	143	150	150	150	151	**183**	251
B6. One-time 30 percent nominal depreciation relative to the baseline in 2018 5/	142	199	198	198	198	199	**241**	326

Table 1b. Samoa: Sensitivity Analysis for Key Indicators of Public and Publicly Guaranteed External Debt, 2017-2037 (concluded)

(In percent)

Debt service-to-exports+remittances ratio								
Baseline	6	7	7	7	7	7	**7**	10
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2017-2037 1/	6	7	7	7	7	6	**6**	7
A2. New public sector loans on less favorable terms in 2017-2037 2	6	7	7	7	8	7	**9**	14
A3. Alternative Scenario: Severe Natural Disaster in 2018	6	7	8	8	8	7	**9**	11
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2018-2019	6	7	7	7	7	7	**7**	10
B2. Export value growth at historical average minus one standard deviation in 2018-2019 3/	6	7	8	8	8	7	**8**	11
B3. US dollar GDP deflator at historical average minus one standard deviation in 2018-2019	6	7	7	7	7	7	**7**	10
B4. Net non-debt creating flows at historical average minus one standard deviation in 2018-2019 4/	6	7	7	7	7	7	**7**	9
B5. Combination of B1-B4 using one-half standard deviation shocks	6	7	7	7	7	7	**7**	10
B6. One-time 30 percent nominal depreciation relative to the baseline in 2018 5/	6	7	7	7	7	7	**7**	10
Debt service-to-revenue ratio								
Baseline	10	12	13	12	13	12	**12**	17
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2017-2037 1/	10	12	12	12	12	11	**10**	10
A2. New public sector loans on less favorable terms in 2017-2037 2	10	12	13	13	13	13	**16**	26
A3. Alternative Scenario: Severe Natural Disaster in 2018	10	13	14	14	14	13	**16**	20
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2018-2019	10	13	14	13	14	13	**13**	19
B2. Export value growth at historical average minus one standard deviation in 2018-2019 3/	10	12	13	12	13	12	**13**	18
B3. US dollar GDP deflator at historical average minus one standard deviation in 2018-2019	10	13	14	14	14	13	**14**	20
B4. Net non-debt creating flows at historical average minus one standard deviation in 2018-2019 4/	10	12	13	12	13	12	**12**	17
B5. Combination of B1-B4 using one-half standard deviation shocks	10	13	14	13	14	13	**13**	19
B6. One-time 30 percent nominal depreciation relative to the baseline in 2018 5/	10	17	18	17	18	17	**17**	24
Memorandum item:								
Grant element assumed on residual financing (i.e., financing required above baseline) 6/	41	41	41	41	41	41	**41**	41

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 2a. Samoa: Public Sector Debt Sustainability Framework Baseline Scenario, 2014-2037

(In percent of GDP, unless otherwise indicated))

	Actual					Estimate	Projections								
	2014	2015	2016	Average 5/	Standard Deviation 5/	2017	2018	2019	2020	2021	2022	2017-22 Average	2027	2037	2023-37 Average
Public sector debt 1/	74.0	76.6	71.4			71.1	71.0	71.2	71.2	71.4	71.7		83.7	105.7	
of which: foreign-currency denominated	51.8	55.3	50.7			50.8	51.1	51.7	52.0	52.3	52.6		64.8	86.8	
Change in public sector debt	0.5	2.5	-5.2			-0.3	-0.1	0.1	0.0	0.2	0.2		2.4	2.1	
Identified debt-creating flows	2.0	7.3	-3.9			-1.0	-0.6	-0.6	-0.8	-0.7	-0.7		1.7	1.4	
Primary deficit	4.4	2.6	-0.9	2.7	2.4	0.6	0.4	0.6	1.0	1.2	1.5	0.9	3.1	3.2	3.1
Revenue and grants	38.0	35.1	33.5			33.7	35.8	32.3	32.1	32.0	31.8		31.7	31.7	
of which: grants	12.6	9.8	6.7			7.8	9.9	6.5	6.5	6.5	6.5		6.5	6.5	
Primary (noninterest) expenditure	42.4	37.7	32.6			34.3	36.2	32.8	33.1	33.1	33.3		34.9	34.9	
Automatic debt dynamics	-2.3	4.7	-3.1			-1.6	-1.0	-1.2	-1.8	-1.9	-2.2		-1.5	-1.8	
Contribution from interest rate/growth differential	-1.5	-2.1	-4.6			-1.3	-0.7	-1.4	-1.9	-2.0	-2.2		-1.5	-1.9	
of which: contribution from average real interest rate	-0.7	-0.9	0.1			0.1	0.0	-0.1	-0.4	-0.6	-0.8		-0.9	-1.1	
of which: contribution from real GDP growth	-0.9	-1.2	-4.7			-1.5	-0.7	-1.2	-1.5	-1.5	-1.5		-0.6	-0.8	
Contribution from real exchange rate depreciation	-0.8	6.8	1.5			-0.3	-0.3	0.1	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	-1.5	-4.8	-1.3			0.7	0.5	0.8	0.9	0.9	0.9		0.7	0.7	
Other Sustainability Indicators															
PV of public sector debt	...	...	57.4			57.1	56.3	55.5	55.1	54.7	54.6		61.8	77.0	
of which: foreign-currency denominated	...	...	36.7			36.7	36.4	36.1	35.9	35.7	35.6		43.0	58.2	
of which: external	...	...	36.7			36.7	36.4	36.1	35.9	35.7	35.6		43.0	58.2	
PV of contingent liabilities (not included in public sector debt)	...	...	...			...	...	...	...	...	...		...	...	
Gross financing need 2/	5.3	3.9	0.8			3.7	4.3	4.5	4.5	4.5	4.6		6.2	7.5	
PV of public sector debt-to-revenue and grants ratio (in percent)	...	...	171.6			169.2	157.1	172.1	171.5	171.3	171.8		194.8	242.6	
PV of public sector debt-to-revenue ratio (in percent)	...	...	214.4			220.2	217.4	215.7	215.2	215.2	216.0		245.1	305.3	
of which: external 3/	...	...	137.0			141.7	140.5	140.1	140.3	140.2	140.8		170.2	230.5	
Debt service-to-revenue and grants ratio (in percent) 4/	2.6	3.6	4.9			9.3	10.8	12.1	10.9	10.5	9.7		9.7	13.7	
Debt service-to-revenue ratio (in percent) 4/	3.9	4.9	6.1			12.1	14.9	15.1	13.7	13.2	12.1		12.2	17.2	
Primary deficit that stabilizes the debt-to-GDP ratio	3.9	0.1	4.3			0.9	0.5	0.4	0.9	1.0	1.3		0.8	1.1	
Key macroeconomic and fiscal assumptions															
Real GDP growth (in percent)	1.2	1.6	6.6	0.9	3.7	2.1	0.9	1.8	2.1	2.1	2.1	1.9	0.8	0.8	0.8
Average nominal interest rate on forex debt (in percent)	1.3	1.3	1.4	1.2	0.5	1.9	2.0	2.2	1.8	1.8	1.4	1.8	1.3	1.2	1.3
Real exchange rate depreciation (in percent, + indicates depreciation)	-1.6	13.6	3.0	-1.4	8.9	-0.6	...	...	...	...	...	...	...	...	...
Inflation rate (GDP deflator, in percent)	0.3	2.7	-1.1	3.1	3.4	1.8	1.9	2.5	2.8	3.0	3.0	2.5	3.0	3.0	3.0
Growth of real primary spending (deflated by GDP deflator, in percent)	17.4	-9.6	-7.8	0.0	7.1	7.6	6.5	-7.8	2.8	2.3	2.7	2.4	0.8	0.8	1.1
Grant element of new external borrowing (in percent)	...	...	...	...	...	39.6	45.9	46.3	42.8	43.0	43.8	43.6	41.9	40.8	...

Sources: Country authorities; and staff estimates and projections.

1/ Includes public sector debt and 18.8 percent of GDP contingent liabilities from PFIs and SOEs. Gross debt is used.

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 2b. Samoa: Sensitivity Analysis for Key Indicators of Public Debt 2017-2037

	Projections							
	2017	2018	2019	2020	2021	2022	2027	2037
PV of Debt-to-GDP Ratio								
Baseline	57	56	56	55	55	55	62	77
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	57	58	59	60	61	62	68	78
A2. Primary balance is unchanged from 2017	57	56	56	55	54	54	53	52
A3. Permanently lower GDP growth 1/	57	57	57	57	58	59	74	121
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2018-2019	57	59	62	63	64	65	80	111
B2. Primary balance is at historical average minus one standard deviations in 2018-2019	57	59	61	61	60	60	68	82
B3. Combination of B1-B2 using one half standard deviation shocks	57	59	62	62	63	63	75	98
B4. One-time 30 percent real depreciation in 2018	57	71	69	68	67	66	69	82
B5. 10 percent of GDP increase in other debt-creating flows in 2018	57	62	62	61	61	61	68	83
PV of Debt-to-Revenue Ratio 2/								
Baseline	169	157	172	172	171	172	195	243
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	169	161	181	186	190	194	213	246
A2. Primary balance is unchanged from 2017	169	157	172	171	170	169	167	163
A3. Permanently lower GDP growth 1/	169	158	176	177	180	183	230	368
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2018-2019	169	163	190	193	197	202	249	343
B2. Primary balance is at historical average minus one standard deviations in 2018-2019	169	165	189	189	189	189	213	259
B3. Combination of B1-B2 using one half standard deviation shocks	169	165	191	193	195	198	234	306
B4. One-time 30 percent real depreciation in 2018	169	199	215	211	208	206	218	257
B5. 10 percent of GDP increase in other debt-creating flows in 2018	169	174	191	190	190	191	215	261
Debt Service-to-Revenue Ratio 2/								
Baseline	9	11	12	11	11	10	10	14
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	9	11	12	11	11	10	11	15
A2. Primary balance is unchanged from 2017	9	11	12	11	11	10	9	9
A3. Permanently lower GDP growth 1/	9	11	12	11	11	10	11	20
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2018-2019	9	11	13	12	12	11	12	20
B2. Primary balance is at historical average minus one standard deviations in 2018-2019	9	11	12	11	11	10	11	15
B3. Combination of B1-B2 using one half standard deviation shocks	9	11	13	12	11	11	11	18
B4. One-time 30 percent real depreciation in 2018	9	13	16	15	15	14	15	22
B5. 10 percent of GDP increase in other debt-creating flows in 2018	9	11	13	12	11	10	11	15

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.