INTERNATIONAL MONETARY FUND

BOLIVIA

External and Public Debt Sustainability Analysis

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Following MDRI debt relief, the sustainability of Bolivia's public debt has continued to improve as a result of overall fiscal surpluses. Debt ratios continue to display ample margins with respect to risk thresholds, and are expected to decline further under baseline policies. Given the predominantly long maturities of remaining stocks of both domestic and foreign debt, debt service is projected to remain low. The path of debt ratios would reach an inflexion point and take on an upward trend under standard stress tests, but would remain within manageable bounds over the medium- and long run.

Background

1. **Bolivia's gross public debt (domestic and external) decreased significantly over the last two years, benefiting from fiscal surpluses following the MDRI**. The gross public debt-to-GDP ratio—35 percent in 2008—is projected to decline further to 23 percent by 2013, and to 16 percent in 2027. Similarly, the NPV of public debt-to-GDP ratio is projected to decline from 33 percent in 2008 to 16 percent during the DSA's projection period. Moreover, with the accumulation of deposits of the nonfinancial public sector in the financial system—amounting to about 18 percent of GDP at present—the solvency of the public sector measured by the net public debt (i.e., gross debt minus those deposits) has improved even more significantly. On account of declining gross debt, net debt ratios would reach very low levels during the projection period.

Baseline scenario

2. **The main assumptions** of the baseline scenario for the period 2008–27 are:

- ***Average annual real GDP growth***: 4.2 percent until 2013, on account of implementation of already identified mining projects, declining to 4 percent during 2014–27.

[1] Since Bolivia is an IDA blend country, this DSA was not conducted jointly with the World Bank.

- ***Average deflator inflation***: 6.7 percent per year until 2013, in line with the latest medium-term staff projections, and would decline further to 4 percent over the long term.

- ***Export and import growth***: in line with the medium-term staff projections and the assumption of 7½ percent growth beyond 2013. The latter would imply stable import and export ratios to GDP over the long term.

- ***FDI***: in line with expected investments for the hydrocarbons and mining sectors.

- ***Financing strategy:*** commercial debt is expected to remain nil, with CAF expected to remain as the main source of financing.

- ***Average concessionality of the public sector borrowing***: projected to evolve, in the medium-term, according to the pipeline of official loans. Over the longer run, concessionality is expected to decrease gradually.

3. **Given the above assumptions, Bolivia's external debt is expected to remain sustainable throughout the projection period**. After a projected small deficit in 2009, the fiscal position would remain close to balance in the period 2010-2013, with an average overall surplus of about 0.1 percent of GDP. Afterwards, the fiscal position would weaken gradually, mainly reflecting lower hydrocarbons-based revenues in relation to GDP, reaching a deficit of about 1 percent of GDP by the end of the projection period. Under the baseline outlook, Bolivia's indebtedness and debt service levels would remain very manageable. Specifically, the total stock of external debt (public and private) is projected to fall to about 16 percent of GDP by 2013, and to stabilize around 5½ percent of GDP by 2027. Consequently, Bolivia's risk of debt distress is very low[2]—an assessment that would holds even under significant stress tests.

Stress tests

4. **Standard stress tests suggests that Bolivia's low external indebtedness is resilient to severe exogenous shocks**. Under the most extreme stress test—a combined shock to debt concessionality, GDP growth, export growth, and external inflation—the ratio of the NPV of debt to GDP deteriorates significantly but eventually stabilizes. In all cases, it would remain below risky levels. Flow indicators also remain manageable under all stress tests.

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[2] The World Bank's three-year average IDA Resource Allocation Index (IRAI) classifies Bolivia as a medium performer with respect to the overall quality of its macroeconomic policies and the related risk thresholds on NPV of debt-to-GDP and debt-to-exports ratios (40 percent and 150 percent, respectively) leave the country's current levels with significant safety margins.

Table 1. Bolivia: External Debt Sustainability Framework, Baseline Scenario, 2005-28 1/

(In percent of GDP, unless otherwise indicated)

	Actual			Historical	Standard	Projections									
	2005	2006	2007	Average 2/	Deviation 2/	2008	2009	2010	2011	2012	2013	Avg. 2008-13	2018	2028	Avg. 2014-28
External debt (nominal) 1/	**64.7**	**40.2**	**25.9**			**19.4**	**20.1**	**19.0**	**18.2**	**17.4**	**16.3**		**11.3**	**5.2**	
Of which: public and publicly guaranteed (PPG)	52.3	...	...			13.3	14.2	13.6	13.2	12.6	11.9		8.3	3.8	
Change in external debt	-3.2	-24.5	...			-6.6	0.7	-1.1	-0.8	-0.9	-1.1		-0.9	-0.4	
Identified net debt-creating flows	-8.3	-24.1	-21.8			-13.4	-2.5	-4.9	-6.4	-6.0	-5.0		-2.6	-0.2	
Non-interest current account deficit	-8.4	-13.7	-14.6	-3.6	7.4	-12.2	-0.5	-2.7	-4.0	-3.7	-2.9		-1.2	0.5	-0.4
Deficit in balance of goods and services	-4.4	-7.7	-6.6			-5.1	4.4	2.1	0.8	1.0	1.7		3.3	2.9	
Exports	34.7	38.2	36.9			38.5	29.6	30.2	30.8	29.9	28.3		25.5	23.2	
Imports	30.3	30.6	30.3			33.4	34.1	32.2	31.6	30.9	29.9		28.8	26.0	
Net current transfers (negative = inflow)	-6.2	-7.3	-8.1	-5.6	1.3	-6.3	-5.5	-5.3	-5.3	-5.2	-5.0		-4.3	-2.7	-3.8
Of which: official	-3.2	-2.6	-1.6			-1.2	-1.1	-1.0	-1.0	-1.0	-0.9		-0.7	-0.3	
Other current account flows (negative = net inflow)	2.1	1.3	0.0			-0.8	0.6	0.6	0.5	0.5	0.5		-0.3	0.3	
Net FDI (negative = inflow)	3.0	-2.2	-2.1	-5.3	5.1	-1.2	-2.3	-2.7	-2.9	-2.7	-2.5		-1.6	-0.8	-1.3
Endogenous debt dynamics 3/	-2.8	-8.3	-5.1			-0.1	0.4	0.4	0.4	0.4	0.4		0.2	0.1	
Contribution from nominal interest rate	1.9	1.9	1.5			1.1	1.1	1.2	1.1	1.1	1.0		0.6	0.3	
Contribution from real GDP growth	-2.8	-2.6	-1.5			-1.2	-0.8	-0.8	-0.7	-0.6	-0.5		-0.4	-0.2	
Contribution from price and exchange rate changes	-1.9	-7.6	-5.1			…	…	…	…	…	…		…	…	
Residual (3-4) 4/	**5.0**	**-0.4**	**7.5**			**6.9**	**3.2**	**3.9**	**5.6**	**5.1**	**3.9**		**1.7**	**-0.2**	
Of which: exceptional financing	0.0	0.0	-0.1			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
NPV of external debt 5/	...	...	...			17.4	16.3	16.4	16.0	15.4	14.5		10.6	5.2	
In percent of exports	...	...	...			45.2	55.2	54.5	51.8	51.5	51.3		41.6	22.3	
NPV of PPG external debt	**...**	**...**	**...**			**11.4**	**10.5**	**11.0**	**10.9**	**10.6**	**10.1**		**7.5**	**3.7**	
In percent of exports	...	...	...			29.5	35.3	36.6	35.4	35.6	35.8		29.6	15.9	
In percent of government revenues	...	...	...			41.9	36.8	39.2	38.2	36.4	34.2		26.1	14.0	
Debt service-to-exports ratio (in percent)	16.5	12.6	21.5			14.5	17.5	16.4	15.0	14.4	13.8		11.2	5.7	
PPG debt service-to-exports ratio (in percent)	11.8	7.5	15.4			10.3	12.2	11.3	10.3	9.8	9.3		7.8	3.9	
PPG debt service-to-revenue ratio (in percent)	14.0	8.7	19.3			14.7	12.8	12.1	11.1	10.0	8.9		6.9	3.4	
Total gross financing need (billions of U.S. dollars)	0.0	-1.2	-1.2			-1.1	0.6	0.1	-0.2	-0.3	-0.2		0.2	0.9	
Non-interest current account deficit that stabilizes debt ratio	-5.2	10.8	-0.3			-5.6	-1.3	-1.6	-3.2	-2.9	-1.8		-0.3	0.9	
Key macroeconomic assumptions															
Real GDP growth (in percent)	4.4	4.8	4.6	3.7	1.0	5.9	4.0	4.2	3.9	3.6	3.4	4.2	3.4	3.4	3.4
GDP deflator in US dollar terms (change in percent)	2.9	13.3	14.5	3.5	8.0	20.1	-1.0	3.6	2.3	2.9	4.5	5.4	4.0	4.1	4.0
Effective interest rate (percent) 6/	3.0	3.5	4.6	3.1	0.8	5.5	6.1	6.3	6.3	6.2	6.0	6.1	5.6	5.3	5.4
Growth of exports of G&S (US dollar terms, in percent)	28.0	31.0	15.4	19.5	12.4	32.9	-20.8	9.9	8.5	3.3	2.4	6.0	7.3	0.0	6.6
Growth of imports of G&S (US dollar terms, in percent)	22.9	19.9	18.5	10.6	10.9	40.4	5.0	2.1	4.2	4.0	4.9	10.1	7.2	0.0	6.6
Grant element of new public sector borrowing (in percent)	...	...	...	...	...	9.9	10.4	9.3	9.0	8.6	8.1	9.2	7.0	5.0	6.0
Aid flows (in billions of US dollars) 7/	0.4	0.4	0.4			0.3	0.3	0.3	0.3	0.3	0.3		0.4	0.5	
Of which: Grants	0.2	0.2	0.2			0.2	0.2	0.2	0.2	0.2	0.2		0.4	0.7	
Of which: Concessional loans	0.2	0.1	0.2			0.1	0.1	0.1	0.1	0.1	0.1		0.1	0.2	
Grant-equivalent financing (in percent of GDP) 8/	...	...	...			1.4	1.4	1.2	1.1	1.1	1.1		1.1	1.0	1.1
Grant-equivalent financing (in percent of external financing) 8/	...	...	...			44.7	40.9	48.0	50.3	54.2	58.5		67.3	79.3	74.6
Memorandum items:															
Nominal GDP (billions of US dollars)	9.5	11.2	13.4			17.1	17.6	19.0	20.2	21.6	23.3		33.5	69.4	
(NPVt-NPVt-1)/GDPt-1 (in percent)						-0.7	1.5	0.6	0.5	0.3	0.3	0.4	0.0	0.0	0.0

Source: Staff simulations.

1/ Includes both public and private sector external debt.

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

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

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

5/ Assumes that NPV of private sector debt is equivalent to its face value.

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

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 NPV of new debt).

Table 2. Bolivia: Sensitivity Analyses for Key Indicators of Public and Publicly Guaranteed External Debt, 2008-27

(In percent)

	Projections											
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2028
	NPV of debt-to-GDP ratio											
Baseline	11	10	11	11	11	10	10	9	9	8	8	4
A. Alternative Scenarios												
A1. Key variables at their historical averages in 2008-27 1/	11	10	11	11	11	10	10	9	9	8	8	4
A2. New public sector loans on less favorable terms in 2008-27 2/	11	12	13	13	13	12	12	12	11	11	10	3
B. Bound Tests												
B1. Real GDP growth at historical average minus one standard deviat	11	12	12	11	11	11	10	9	9	8	8	4
B2. Export value growth at historical average minus one standard dev	11	12	12	11	11	11	13	15	16	18	19	21
B3. US dollar GDP deflator at historical average minus one standard	11	12	12	12	11	11	10	9	9	8	8	4
B4. Net non-debt creating flows at historical average minus one stanc	11	16	19	19	19	17	16	15	13	12	11	4
B5. Combination of B1-B4 using one-half standard deviation shocks	11	11	11	11	11	11	13	15	16	18	19	22
B6. One-time 30 percent nominal depreciation relative to the baseline	11	17	17	16	16	15	14	13	12	12	11	5
	NPV of debt-to-exports ratio											
Baseline	29	35	37	35	36	36	38	36	34	32	30	16
A. Alternative Scenarios												
A1. Key variables at their historical averages in 2007-26 1/	29	35	37	35	36	36	38	36	34	32	30	16
A2. New public sector loans on less favorable terms in 2007-26 2/	28	42	42	41	42	44	47	46	44	42	40	15
B. Bound Tests												
B1. Real GDP growth at historical average minus one standard deviat	28	40	38	37	37	37	38	36	34	32	30	16
B2. Export value growth at historical average minus one standard dev	28	28	26	24	24	27	34	39	43	47	50	61
B3. US dollar GDP deflator at historical average minus one standard	28	40	38	37	37	37	38	36	34	32	30	16
B4. Net nondebt creating flows at historical average minus one stand	28	53	64	62	62	62	63	58	53	47	43	17
B5. Combination of B1-B4 using one-half standard deviation shocks	28	28	26	24	24	27	35	40	44	48	52	65
B6. One-time 30 percent nominal depreciation relative to the baseline	28	40	38	37	37	37	38	36	34	32	30	16
	NPV of debt-to-revenue ratio											
Baseline	42	37	39	38	36	34	33	31	30	28	26	14
A. Alternative Scenarios												
A1. Key variables at their historical averages in 2007-26 1/	42	37	39	38	36	34	33	31	30	28	26	14
A2. New public sector loans on less favorable terms in 2007-26 2/	40	44	45	45	43	42	41	40	39	37	35	13
B. Bound Tests												
B1. Real GDP growth at historical average minus one standard deviat	40	42	42	40	38	36	34	32	30	28	27	14
B2. Export value growth at historical average minus one standard dev	40	42	41	40	38	39	45	51	56	62	67	81
B3. US dollar GDP deflator at historical average minus one standard	40	41	42	40	38	36	34	32	31	29	27	14
B4. Net non-debt creating flows at historical average minus one stanc	40	56	69	67	64	59	55	51	46	42	38	15
B5. Combination of B1-B4 using one-half standard deviation shocks	40	40	40	38	36	37	44	50	56	61	67	82
B6. One-time 30 percent nominal depreciation relative to the baseline	40	60	59	57	54	50	48	46	43	40	38	20
	Debt service-to-exports ratio											
Baseline	10	12	11	10	10	9	10	9	9	9	8	4
A. Alternative Scenarios												
A1. Key variables at their historical averages in 2008-27 1/	10	13	11	9	9	5	3	0	-2	-5	-9	4
A2. New public sector loans on less favorable terms in 2008-27 2/	10	13	12	11	10	10	6	6	6	6	6	5
B. Bound Tests												
B1. Real GDP growth at historical average minus one standard deviat	10	12	11	10	10	9	10	9	9	9	8	4
B2. Export value growth at historical average minus one standard dev	10	8	6	4	3	0	-3	-3	-2	-2	-2	2
B3. US dollar GDP deflator at historical average minus one standard	10	12	11	10	10	9	10	9	9	9	8	4
B4. Net non-debt creating flows at historical average minus one stanc	10	12	12	12	11	12	14	13	12	12	11	4
B5. Combination of B1-B4 using one-half standard deviation shocks	10	8	6	4	3	0	-4	-3	-3	-3	-3	2
B6. One-time 30 percent nominal depreciation relative to the baseline	10	12	11	10	10	9	6	5	5	5	5	6
	Debt service-to-revenue ratio											
Baseline	15	13	12	11	10	9	8	8	8	8	7	3
A. Alternative Scenarios												
A1. Key variables at their historical averages in 2008-27 1/	15	13	11	9	9	5	2	0	-2	-4	-8	3
A2. New public sector loans on less favorable terms in 2008-27 2/	15	13	13	12	10	10	6	6	5	5	5	4
B. Bound Tests												
B1. Real GDP growth at historical average minus one standard deviat	15	13	12	11	10	9	9	8	8	8	7	3
B2. Export value growth at historical average minus one standard dev	15	13	10	6	5	1	-4	-3	-3	-3	-3	2
B3. US dollar GDP deflator at historical average minus one standard	15	13	12	11	10	9	9	8	8	8	7	3
B4. Net nondebt creating flows at historical average minus one stand	15	13	13	12	11	11	12	11	11	10	10	4
B5. Combination of B1-B4 using one-half standard deviation shocks	15	12	9	6	5	0	-4	-4	-4	-4	-4	2
B6. One-time 30 percent nominal depreciation relative to the baseline	15	18	17	16	14	13	7	7	7	7	7	7
Memorandum item:												
Grant element assumed on residual financing (i.e., financing required	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2

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.

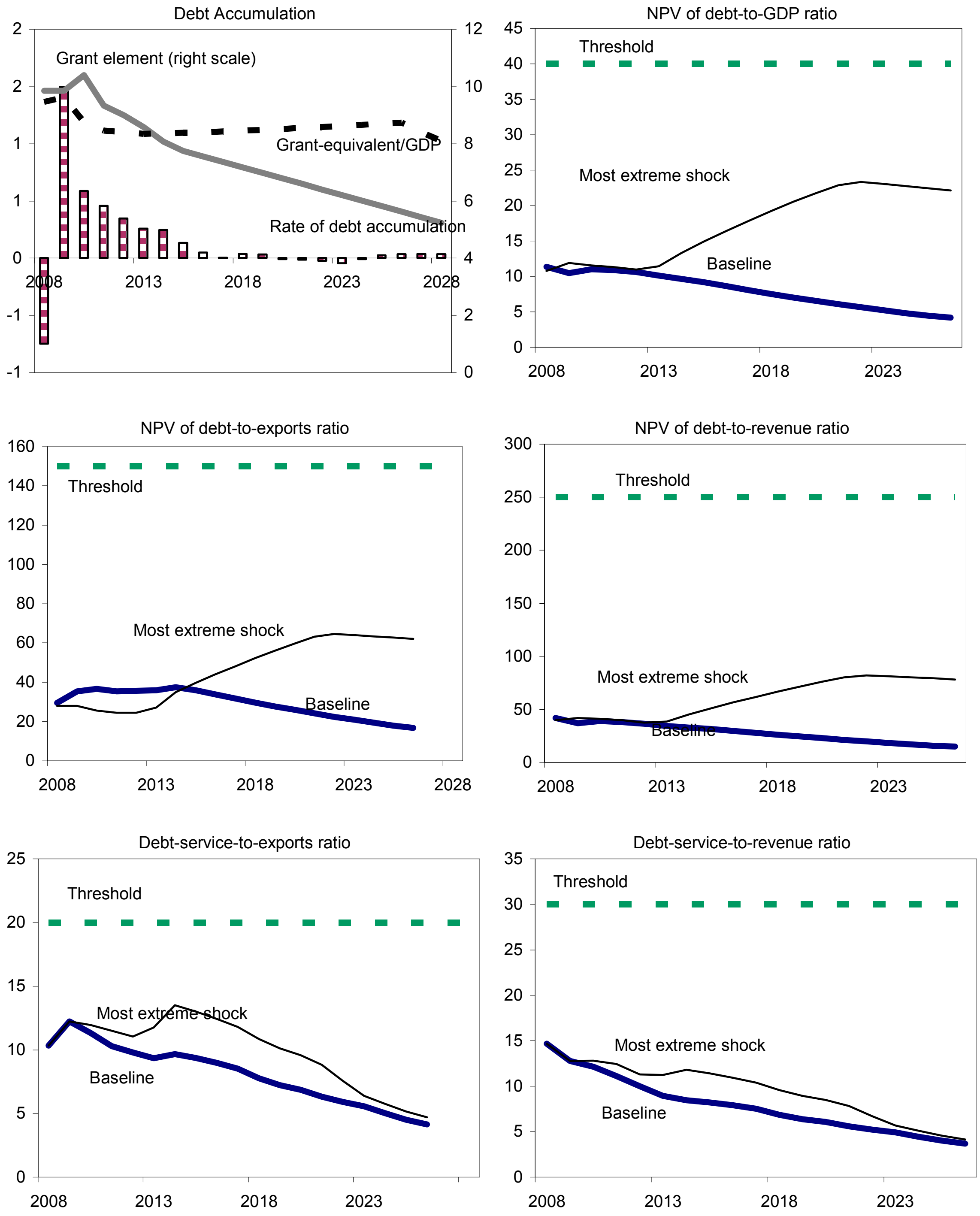
3/ Exports values are assumed to remain permanently at the lower level, but the current account as a share of GDP is assumed to return to its baseline level after the shock (implicitly assuming an offsetting adjustment in import levels).

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.

Figure 1. Bolivia: Indicators of Public and Publicly Guaranteed External Debt Under Alternative Scenarios, 2008-2027



Source: Staff projections and simulations.
Note: Scenarios based on recent history yield better outcomes on NFA because of recent large current account
surpluses. It is assumed that this would translate into larger reserve accumulation as opposed to a reduction in gross debt

Table 3. Bolivia: Public Sector Debt Sustainability Framework, Baseline Scenario, 2008-2027

(In percent of GDP, unless otherwise indicated)

	Actual			Historical	Standard	Projections									
												Average			Average
	2005	2006	2007	Average 1/	Deviation 1/	2008	2009	2010	2011	2012	2013	2007-13	2018	2027	2013-27
Public sector debt 2/	80.4	55.2	40.9			35.0	35.7	30.9	27.6	25.2	23.1		17.9	16.0	
Of which: foreign-currency denominated	61.4	38.5	27.3			22.6	23.0	19.9	17.8	16.2	14.9		11.5	10.3	
Change in public sector debt	-9.2	-25.1	-14.3			-5.9	0.7	-4.8	-3.4	-2.4	-2.1		-0.8	0.0	
Identified debt-creating flows	-7.7	-17.8	-10.3			-12.4	1.0	-4.1	-2.9	-2.4	-2.1		-0.8	0.0	
Primary deficit	-0.8	-7.0	-5.1	1.1	4.3	-5.3	-1.6	-2.2	-2.4	-2.0	-1.6	-2.5	-0.7	0.5	-0.3
Revenue and grants	30.9	34.3	34.6			36.3	34.0	33.8	33.7	33.0	31.9		29.3	26.3	
Of which: grants	2.1	1.8	1.6			1.2	0.8	0.9	0.9	0.9	1.0		0.9	0.9	
Primary (noninterest) expenditure	30.2	27.3	29.5			31.0	32.4	31.5	31.3	31.0	30.3		28.5	26.8	
Automatic debt dynamics	-5.9	-10.8	-5.1			-7.1	2.6	-1.8	-0.5	-0.3	-0.5		-0.1	-0.5	
Contribution from interest rate/growth differential	-3.8	-4.8	-1.5			-2.3	0.5	-0.8	-0.1	0.2	0.2		0.2	-0.3	
Of which: contribution from average real interest rate	0.0	-1.1	0.9			0.0	1.9	0.6	1.0	1.2	1.1		0.8	0.2	
Of which: contribution from real GDP growth	-3.8	-3.7	-2.4			-2.3	-1.3	-1.4	-1.2	-1.0	-0.8		-0.6	-0.5	
Contribution from real exchange rate depreciation	-2.1	-6.0	-3.7			-4.8	2.0	-1.0	-0.4	-0.5	-0.7		...	...	
Other identified debt-creating flows	-1.1	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)	-1.1	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	-7.3	-4.0			6.5	-0.3	-0.7	-0.4	0.0	0.0		0.0	0.0	
NPV of public sector debt	55.5	49.3	38.9			32.9	34.1	29.2	25.3	22.4	21.0		17.3	15.9	
Of which: foreign-currency denominated	36.5	32.6	25.2			20.4	21.3	18.1	15.5	13.4	12.7		10.9	10.2	
Of which: external	...	20.5	14.8			11.9	13.3	12.1	10.8	9.4	9.1		7.0	3.7	
NPV of contingent liabilities (not included in public sector debt)	...	...	...			...	...	...	...	...	...		...	...	
Gross financing need 3/	12.1	0.6	1.4			0.4	5.5	3.9	3.1	2.9	3.0		2.3	2.7	
NPV of public sector debt-to-revenue and grants ratio (in percent)	...	143.6	112.4			90.5	100.3	86.3	75.2	67.8	65.7		59.2	60.4	
NPV of public sector debt-to-revenue ratio (in percent)	...	151.7	118.0			93.6	102.8	88.7	77.2	69.7	67.9		61.0	62.6	
Of which: external 4/	...	63.0	44.7			33.9	40.1	36.7	33.1	29.4	29.5		24.8	14.5	
Debt service-to-revenue and grants ratio (in percent) 5/	31.8	20.0	17.7			15.3	16.4	14.3	12.6	11.4	10.9		7.6	6.6	
Debt service-to-revenue ratio (in percent) 5/	34.2	21.1	18.6			15.8	16.8	14.7	13.0	11.7	11.3		7.9	6.8	
Primary deficit that stabilizes the debt-to-GDP ratio	8.4	18.1	9.2			0.6	-2.2	2.5	0.9	0.4	0.6		0.1	0.5	
Key macroeconomic and fiscal assumptions															
Real GDP growth (in percent)	4.4	4.8	4.6	3.1	1.5	5.9	4.0	4.2	3.9	3.6	3.4	4.2	3.4	3.4	3.4
Average nominal interest rate on forex debt (in percent)	3.6	3.7	5.9	4.3	0.9	7.5	7.5	7.5	7.9	8.5	9.7	8.1	9.8	7.9	9.5
Average real interest rate on domestic currency debt (in percent)	-1.8	-8.5	-3.7	-5.5	2.8	-10.7	5.6	-5.0	-0.7	0.6	-1.6	-2.0	-1.6	-6.3	-3.4
Real exchange rate depreciation (in percent, + indicates depreciation)	-3.2	-10.2	-9.5	0.0	6.8	-17.7	...	...	...	...	...	...	...	...	...
Inflation rate (GDP deflator, in percent)	5.9	13.7	7.4	6.1	3.4	14.0	-2.3	10.0	6.2	5.3	6.9	6.7	4.0	4.0	4.0
Growth of real primary spending (deflated by GDP deflator, in percent)	7.1	-5.2	13.0	4.0	6.1	11.2	8.7	1.4	3.0	2.7	1.1	4.7	2.3	2.8	2.5
Grant element of new external borrowing (in percent)	...	...	4.0	...	...	4.6	5.0	5.2	5.2	5.2	5.2	5.1	3.9	1.8	...

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

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

2/ Nonfinancial public sector gross debt.

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

4/ Revenues excluding grants.

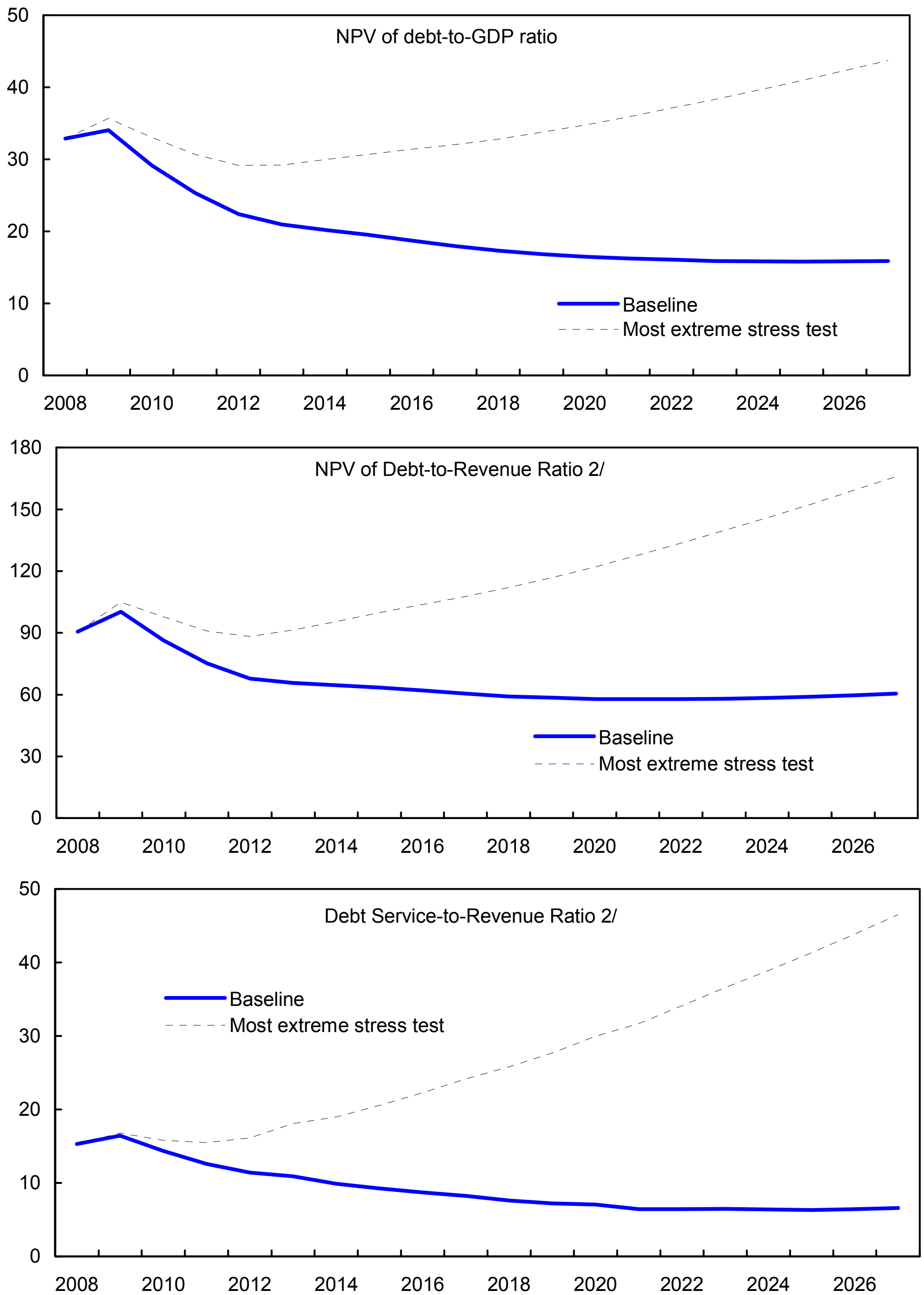
5/ Debt service is defined as the sum of interest and amortization of medium and long-term debt.

Table 4. Bolivia: Sensitivity Analysis for Key Indicators of Public Debt 2008-2027

	Projections							
	2008	2009	2010	2011	2012	2013	2018	2027
NPV of Debt-to-GDP Ratio								
Baseline	33	34	29	25	22	21	17	16
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	33	37	36	36	36	37	45	55
A2. Primary balance is unchanged from 2008	33	33	27	23	19	16	2	-28
A3. Permanently lower GDP growth 1/	33	34	30	26	24	23	23	35
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2009-2010	33	36	33	31	29	29	33	44
B2. Primary balance is at historical average minus one standard deviations in 2009-2010	33	39	39	35	32	31	27	26
B3. Combination of B1-B2 using one half standard deviation shocks	33	38	38	34	31	30	26	24
B4. One-time 30 percent real depreciation in 2009	33	45	40	36	32	31	28	29
B5. 10 percent of GDP increase in other debt-creating flows in 2009	33	44	39	35	32	31	27	26
NPV of Debt-to-Revenue Ratio 2/								
Baseline	91	100	86	75	68	66	59	60
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	91	109	106	106	109	117	154	208
A2. Primary balance is unchanged from 2008	91	96	80	67	56	49	8	-105
A3. Permanently lower GDP growth 1/	91	101	88	78	72	72	80	132
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2009-2010	91	105	98	91	88	91	112	166
B2. Primary balance is at historical average minus one standard deviations in 2009-2010	91	113	115	103	97	96	92	98
B3. Combination of B1-B2 using one half standard deviation shocks	91	112	113	101	94	93	89	93
B4. One-time 30 percent real depreciation in 2009	91	133	118	106	98	97	97	109
B5. 10 percent of GDP increase in other debt-creating flows in 2009	91	130	116	105	98	97	94	100
Debt Service-to-Revenue Ratio 2/								
Baseline	15	16	14	13	11	11	8	7
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	15	17	17	19	22	27	42	65
A2. Primary balance is unchanged from 2008	15	16	13	10	8	6	-9	-54
A3. Permanently lower GDP growth 1/	15	16	15	13	12	12	14	32
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2009-2010	15	17	16	15	16	18	26	47
B2. Primary balance is at historical average minus one standard deviations in 2009-2010	15	16	19	22	22	24	21	22
B3. Combination of B1-B2 using one half standard deviation shocks	15	17	18	21	21	22	19	20
B4. One-time 30 percent real depreciation in 2009	15	18	17	16	15	16	17	23
B5. 10 percent of GDP increase in other debt-creating flows in 2009	15	16	24	23	24	26	22	23

Sources: Bolivian authorities; and Fund staff estimates and projections.
1/ Assumes that real GDP growth is at baseline minus one s.d. divided by the square root of 20 (i.e., the length of the projection period).
2/ Revenues are defined inclusive of grants.

Figure 2. Bolivia: Indicators of Public Debt Under Alternative Scenarios, 2008-2027 1/



Source: Staff projections and simulations.
1/ Most extreme stress test is test that yields highest ratio in 2018.
2/ Revenue including grants.