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AND
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REPUBLIC OF ARMENIA

Joint IMF/World Bank Debt Sustainability Analysis

Prepared by the Staffs of the International Monetary Fund and the World Bank

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This debt sustainability analysis, drafted by the Fund and Bank staffs, presents joint IMF-World Bank debt sustainability analysis (DSA) for Armenia using the debt Sustainability framework for low-Income Countries (LIC). Armenia is assessed by the Bank and Fund staffs to be at low risk of external debt distress, with all debt indicators below the relevant country-specific thresholds, including when subject to stress tests.[1] Armenia's public sector debt also remains sustainable, as fiscal consolidation has reduced the fiscal deficit from 7.9 percent of GDP in 2009 to a projected 3½ percent in 2011. However, with debt ratios at much higher levels than before 2009, further consolidation and fiscal discipline will be needed to preserve debt and fiscal sustainability over the long term. The DSA suggests that a fiscal deficit significantly in excess of the 2 percent envisaged over the medium term (equivalent to 2.8 percent when net external lending is included) would lead to an unsustainable increase in debt levels.

I. Background

As of end-2010, Armenia's nominal external debt stood at $6.1 billion, 65 percent of GDP. Just under 55 percent was public and publicly-guaranteed (PPG) debt, of which two-thirds was owed to multilateral creditors.[2] Reflecting the significant share of concessional borrowing, the present value (PV) of the external PPG debt stood at $2.7 billion, 27.6 percent of GDP. Including domestic debt, total nominal public debt increased from 16.1 to 39.2 percent of GDP during 2008–10. Prior to the crisis, World Bank IDA credits accounted for the largest share of public borrowing. Most of the increase of debt during the crisis stemmed from external borrowing, with the IMF and Russia providing almost two-thirds of

[1] Armenia is classified as a strong performer based on its three-year average score of 4.24 on the Bank's Country Policy and Institutional Assessment (CPIA), which measures strength of policies and institutions. For a strong performer (three-year average CPIA above 3.75), the indicative thresholds (for a country with high remittances) are: PV-of-debt-to-GDP + remittances ratio of 45 percent; PV-of-debt-to-exports + remittances ratio of 180 percent; PV-of-debt-to-revenue ratio of 300 percent; debt service-to-exports + remittances ratio of 22.5 percent; and debt service-to-revenue ratio of 35 percent.

[2] External private debt has been revised significantly since the last DSA, based on new data from the authorities.

the additional debt in 2008–10. Almost 80 percent of private debt is medium and long-term, much of which consists of loans to the banking sector from parent banks and international financial institutions. Short-term private debt amounted to around $620 million as of end-2010.

The current DSA macroeconomic assumptions are broadly in line with the last DSA conducted in 2010 (Box 1).[3] Key differences are a somewhat stronger initial position stemming from a faster fiscal consolidation as well as a stronger dram. Assumptions on the mix of external borrowing (concessional vs. non-concessional) and the terms of financing have also been revised to take account of Armenia's impending graduation from concessional financing.[4]

Armenia: External Public Debt Stock
(U.S. Dollars, in millions)

	2008	2009	2010
STOCK OUTSTANDING	1577	2967	3299
Multilateral	1235	2014	2254
IBRD	5	53	106
IDA	1015	1161	1160
EBRD	0	1	10
IFAD	58	60	62
OPEC	15	25	29
ADB	8	127	147
IMF	135	587	741
Bilateral (Paris Club)	342	953	1044
Russia	0	500	500
Germany-KfW	125	143	133
France	5	5	4
USA	37	35	33
Japan - JICA	175	271	374
Bilateral (Non Paris Club)	0	0	1

Source: Armenian authorities.

[3] See IMF Country Report No. 10/350.

[4]The small increase in the grant element of new borrowing in 2012 reflects expected disbursements from official creditors. The slight fall in the average interest rate over the medium term is driven largely by amortization of the non-concessional debt contracted during the crisis

II. External DSA

Baseline Scenario

The baseline scenario shows that debt should remain manageable (Tables 1 and 3). The PV of external debt would peak at around 59 percent of GDP next year, before declining to 52 percent in 2016 and 37 percent of GDP by 2031. The PV of external debt stood at 281 percent of exports plus remittances in 2010 and is projected to fall to around 200 percent by 2016 and 120 percent by 2031. External debt service is projected to increase from 21.6 percent of exports in 2010 to 29.3 percent in 2013, as crisis support unwinds, and then decrease to under 15 percent in 2031. The baseline assumes a moderation of private sector borrowing that characterized the first half of 2011, as remittances and FDI further rebound.

PPG external debt remains at sustainable levels. The NPV of external PPG debt is expected to peak next year at 30 percent of GDP, before declining to 26 percent of GDP in 2016 and 19 percent of GDP in 2030. The NPV of public external debt should fall from 134 percent of exports in 2010 to 63 percent in 2030. The PV of public external debt will peak this year at 150 percent of fiscal revenues before declining to 119 percent in 2016 and 79 percent in 2031. PPG debt service ratios peak in 2013 at 16 percent of exports and 19 percent of revenues and decline rapidly thereafter. Armenia's gross international reserves are expected to fall from almost five months of imports this year to a still-comfortable four months in 2013, before recovering gradually thereafter.

Box 1. Armenia: Key Macroeconomic Assumptions for Baseline Scenario (2010–30)

Real GDP growth is projected to be 4.6 percent in 2011, and 4 percent per year (medium-term potential growth rate) thereafter. This is well below the 10-year historical average of 8.7 percent, which reflected strong growth of residential construction, which is unlikely to reoccur. Near-term growth will be supported by robust activity in industry (particularly mining), a rebound in remittances, and gradual recovery in FDI.

Inflation should remain below 5 percent at end-2011 and average 3.6 percent in 2012. Average inflation over the long term is assumed to be around 4 percent, consistent with the CBA's target range.

The **overall fiscal deficit** is projected to decrease to 2.3 percent of GDP by 2013 and remain at 2 percent of GDP thereafter. This is slightly higher than the 1–2 percent assumed in the previous DSA and reflects the need to balance the necessity of a buffer against shocks with providing additional resources for essential infrastructure and social spending. External net lending is assumed to continue at 0.8 percent of GDP over the projection period.

External financing is assumed to average 2.5 percent of GDP over the forecast period, in line with the average in the decade prior to the crisis. However, the composition of new lending will change as Armenia graduates from concessional financing into non-concessional borrowing. The DSA assumes no recourse to non-official commercial borrowing over the medium term, and only gradual access thereafter.

The **external current account deficit** is projected to narrow to under 8 percent of GDP in 2016, as exports and remittances pick up in line with the global recovery. Exports are projected to grow robustly over the medium term, as new investments become operational. The deficit is expected to be largely financed by FDI rather than through debt-creating flows.

Remittances will continue to play an important role in financing the trade deficit, but are expected to decline from around 7 percent of GDP to 4 percent at the end of the projection period.

FDI is expected to average 7 percent of GDP. Initially, FDI will likely be concentrated in mining. Over time, business climate reforms should yield a more diversified FDI structure.

Alternative Scenarios and Stress Tests

The standard set of alternative scenarios and bound tests indicates that the external debt outlook remains vulnerable to a sharp depreciation of the dram (Table 3, Figure 1). Under an adverse scenario of a 30 percent depreciation in 2012, the PV of external debt would increase from 28 percent of GDP plus remittances in 2010 to 39 percent in 2012 and then decrease to 26 percent in 2031. The second-most adverse scenario—lower export growth—would push the PV of external debt to 32 percent of GDP plus remittances in 2013 and back to 19 percent by 2031. Under the 30 percent depreciation scenario, debt service would increase from 4 percent of revenues in 2011 to 27 percent in 2013, coming down to 14 percent by 2031.

An additional scenario considers the impact of the possible borrowing in support of the Nairit chemical plant. This borrowing would add around $400 million to Armenia's nominal external debt and increase the PV-of-PPG-debt-to-GDP ratio by around three percent, reducing Armenia's borrowing room in the event of an exogenous crisis by the same amount.

Under these standard alternative scenarios and bound tests, external debt ratios remain below the relevant thresholds. However, the thresholds are applied only to PPG debt, and exclude private external debt, which is limited in most LICs. In Armenia, however, the private sector has built up substantial external liabilities, and caution is warranted in interpreting the results.

III. PUBLIC SECTOR DSA

Baseline Scenario

The baseline scenario shows a sustainable position (Table 2 and Figure 2). The PV of public sector debt would peak next year at 36 percent of GDP and remain broadly stable thereafter, reaching around 40 percent of GDP at the end of the projection period. The NPV of debt would increase from 167 percent of fiscal revenues in 2010 to 176 percent in 2011, before dropping to 164 percent at 2030. The public debt indicators would remain at reasonable levels throughout the projection period and below the indicative thresholds. However, given the legal requirement to keep public debt below 50 percent of the previous year's GDP, the debt ratios leave little borrowing space in the event of a major exogenous shock, such as in 2009.

Alternative Scenarios and Stress Tests

The standard set of alternative scenarios and bound tests indicates that Armenia's public debt outlook would be most adversely affected by a lasting shock to growth (Table.4, Figure.2).[5] Under the adverse growth scenario, which assumes GDP growth of 2.1 percent throughout the projection period without a commensurate cut in spending, public debt ratios would follow a persistent upward trend. The most extreme adverse scenario in the medium term is a 30 percent depreciation in 2012, which would push the net present value of debt to 49 percent in 2012, and the debt ratio would gradually increase thereafter to 56 percent by 2031. This scenario also worsens Armenia's liquidity situation, increasing the debt service-to-revenue ratio to 35 percent in 2013. This result reinforces the importance of maintaining prudent financial policies and preserving macroeconomic stability in order to safeguard the debt outlook. The results of the Nairit simulation (Table 4, A.4), which increases the PV debt-to-GDP ratio by three percentage points, underscore that the debt impact of this large project should also be carefully analyzed.

IV. Debt Distress Classification and Conclusions

In the view of the Bank and Fund staffs, Armenia should be considered at a low level of debt distress, based on external debt burden indicators. The public sector DSA suggests that Armenia's overall public sector debt dynamics are sustainable in light of the current size of the debt stock.[6] The authorities broadly agreed with the findings of the DSA, although they did note that consideration should also be given to analysis of debt sustainability on a net basis to take account of Armenia's gross assets, which include on-lending of a substantial share of the large-scale crisis-related financing from Russia to Armenian companies via the local banking sector.

At the same time, the rapid accumulation of public debt since the onset of the global crisis calls for continuing fiscal consolidation. Public debt was just 16 percent of GDP at end-2008, but reached 39 percent of GDP at end-2010, and is expected to peak at over 43 percent of GDP in 2012 and remain at similar levels over the medium term. While projected debt-to-GDP levels do not breach the indicative thresholds, the ratios remain much higher than prior to the crisis, pointing to a lower resilience to shocks. Moreover, the outlook is subject to risks, particularly if remittances become volatile over the medium term. A cautious approach to new debt contraction is therefore warranted, and further fiscal consolidation will be essential to safeguard Armenia's debt sustainability.

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[5] For the implications of a sudden short-term shock, see also the World Bank's 2011 Public Expenditure Review, which suggested that a one-year, 7 percent contraction in GDP could push debt ratios above sustainable levels (World Bank, "Armenia: Fiscal Consolidation and Recovery," 2011, Report No. 62587-AM).

[6] Armenia's debt dynamics are in line with the assessment made at the time of the previous DSA.

Table 1. Armenia: External Debt Sustainability Framework, Baseline Scenario, 2008–31 1/

(In percent of GDP, unless otherwise indicated)

	Actual			Historical 6/ Average	Standard 6/ Deviation	Projections									
	2008	2009	2010			2011	2012	2013	2014	2015	2016	2011–16 Average	2021	2031	2017–31 Average
External debt (nominal) 1/	29.5	57.8	64.6			65.5	66.8	64.5	61.8	60.0	58.3		51.4	38.4	
Of which: public and publicly guaranteed (PPG)	13.6	35.7	34.2			36.7	37.6	35.7	33.7	32.8	31.9		28.8	21.1	
Change in external debt	-0.3	28.2	6.8			0.9	1.3	-2.4	-2.6	-1.8	-1.8		-1.5	-1.2	
Identified net debt-creating flows	-2.5	17.7	4.2			2.9	1.7	0.1	-1.6	-2.1	-2.2		-0.7	-0.9	
Non-interest current account deficit	11.0	14.5	13.1	6.6	5.5	10.5	9.0	7.8	6.5	6.2	6.1		6.8	5.5	6.3
Deficit in balance of goods and services	25.6	27.1	24.3			23.1	22.4	21.4	20.2	19.8	19.3		17.8	13.7	
Exports	15.1	15.4	20.7			22.7	23.8	24.9	25.6	25.9	26.0		27.3	30.7	
Imports	40.7	42.6	44.9			45.8	46.1	46.3	45.8	45.7	45.2		45.1	44.3	
Net current transfers (negative = inflow)	-9.8	-9.4	-6.0	-9.2	1.9	-6.9	-7.0	-7.1	-7.0	-7.1	-6.9		-5.9	-4.2	-5.4
Of which: official	-0.6	-0.9	-0.9			-1.1	-0.7	-0.5	-0.2	-0.2	-0.1		0.0	0.0	
Other current account flows (negative = net inflow)	-4.9	-3.2	-5.2			-5.8	-6.4	-6.6	-6.6	-6.5	-6.3		-5.2	-4.0	
Net FDI (negative = inflow)	-8.1	-8.4	-6.0	-6.1	1.8	-6.4	-6.6	-7.0	-7.5	-7.7	-7.8		-7.4	-6.6	-7.1
Endogenous debt dynamics 2/	-5.5	11.6	-2.8			-1.1	-0.7	-0.7	-0.6	-0.6	-0.5		-0.2	0.3	
Contribution from nominal interest rate	0.8	1.3	1.6			1.7	1.9	1.9	1.8	1.7	1.7		1.8	1.8	
Contribution from real GDP growth	-1.6	5.6	-1.1			-2.8	-2.6	-2.6	-2.5	-2.3	-2.3		-2.0	-1.5	
Contribution from price and exchange rate changes	-4.6	4.7	-3.3			…	…	…	…	…	…		…	…	
Residual (3-4) 3/	2.3	10.5	2.6			-2.1	-0.4	-2.5	-1.0	0.3	0.5		-0.8	-0.3	
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/	…	…	58.2			58.8	59.5	56.9	54.7	53.4	52.2		47.5	36.7	
In percent of exports	…	…	281.5			259.4	250.1	229.0	213.5	206.5	200.9		174.0	119.7	
PV of PPG external debt	…	…	27.8			30.0	30.3	28.1	26.5	26.1	25.8		24.9	19.4	
In percent of exports	…	…	134.6			132.4	127.3	113.1	103.5	101.0	99.3		91.2	63.2	
In percent of government revenues	…	…	142.9			149.7	146.3	134.3	124.8	121.8	119.1		110.1	78.6	
Debt service-to-exports ratio (in percent)	15.6	22.3	21.6			19.4	24.6	29.3	23.1	18.4	18.2		18.5	14.8	
PPG debt service-to-exports ratio (in percent)	3.1	5.4	4.7			4.7	10.3	15.8	10.2	5.9	6.1		8.5	7.8	
PPG debt service-to-revenue ratio (in percent)	2.3	4.1	5.0			5.3	11.9	18.7	12.3	7.2	7.4		10.3	9.6	
Total gross financing need (in millions of U.S. dollars)	1078.7	1319.1	1579.6			1474.2	1516.1	1599.2	1321.7	1194.9	1226.9		1848.1	2832.5	
Non-interest current account deficit that stabilizes debt ratio	11.3	-13.7	6.2			9.6	7.7	10.1	9.2	8.0	7.9		8.3	6.7	
Key macroeconomic assumptions															
Real GDP growth (in percent)	6.9	-14.1	2.1	8.3	8.8	4.6	4.0	4.0	4.0	4.0	4.0	4.1	4.0	4.0	4.0
GDP deflator in US dollar terms (change in percent)	18.4	-13.6	6.1	9.2	12.1	3.3	-0.6	-0.3	0.8	1.8	2.1	1.2	2.0	2.0	2.0
Effective interest rate (percent) 5/	3.3	3.3	3.1	2.4	1.7	2.8	3.0	3.0	2.9	3.0	3.0	3.0	3.7	4.8	4.0
Growth of exports of G&S (U.S. dollar terms, in percent)	-1.1	-24.0	45.0	17.5	19.6	18.5	8.5	8.4	7.9	6.9	6.6	9.5	7.2	7.4	7.3
Growth of imports of G&S (U.S. dollar terms, in percent)	32.3	-22.4	14.4	17.3	18.1	10.1	4.2	4.0	3.7	5.6	5.1	5.4	5.9	5.9	5.9
Grant element of new public sector borrowing (in percent)	…	…	…	…	…	19.6	21.6	16.5	9.1	6.1	5.2	13.0	0.6	-2.3	-0.8
Government revenues (excluding grants, in percent of GDP)	20.1	20.2	19.5			20.0	20.7	20.9	21.2	21.4	21.6		22.6	24.7	23.3
Aid flows (in millions of U.S. dollars) 7/	209.5	965.0	333.1			319.0	211.2	130.4	81.6	72.7	71.1		56.0	30.8	
Of which: grants	49.4	58.3	114.1			168.7	39.5	31.4	28.3	27.9	27.5		17.7	10.8	
Of which: concessional loans	160.1	906.7	218.9			150.4	171.7	98.9	53.3	44.9	43.6		38.3	20.0	
Grant-equivalent financing (in percent of GDP) 8/	…	…	…			2.4	1.2	0.8	0.4	0.4	0.3		0.1	0.0	0.1
Grant-equivalent financing (in percent of external financing) 8/	…	…	…			44.3	28.9	24.1	19.9	15.6	14.0		4.6	-0.7	2.3
Memorandum items:															
Nominal GDP (in millions of U.S. dollars)	11662.0	8647.9	9371.2			10125.8	10472.5	10856.9	11377.0	12039.5	12782.6		17181.0	31001.6	
Nominal dollar GDP growth	26.7	-25.8	8.4			8.1	3.4	3.7	4.8	5.8	6.2	5.3	6.1	6.1	6.1
PV of PPG external debt (in millions of U.S. dollars)			2679.7			2966.8	3081.9	2996.5	2978.2	3115.6	3265.6		4235.4	5950.1	
(PVt-PVt-1)/GDPt-1 (in percent)						3.1	1.1	-0.8	-0.2	1.2	1.2	0.9	1.0	0.5	1.0
Gross remittances (in millions of U.S. dollars)	1062.4	733.2	477.1			586.9	657.3	716.4	773.8	827.9	865.2		1007.9	1302.8	
PV of PPG external debt (in percent of GDP + remittances)	…	…	26.5			28.4	28.5	26.4	24.8	24.4	24.1		23.5	18.6	
PV of PPG external debt (in percent of exports + remittances)	…	…	108.0			105.4	100.7	89.4	81.8	79.8	78.8		75.1	55.6	
Debt service of PPG external debt (in percent of exports + remittances)	…	…	3.8			3.7	8.2	12.5	8.0	4.7	4.9		7.0	6.8	

Sources: Armenian authorities; and Fund 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); on-lending activities (especially in 2009); changes in gross foreign assets; and valuation adjustments. For projections also includes contribution from price and exchange rate changes.

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

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

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

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

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

Table 2. Armenia: Public Sector Debt Sustainability Framework, Baseline Scenario, 2008–31

(In percent of GDP, unless otherwise indicated)

	Actual					Estimate	Projections								
	2008	2009	2010	Average	Standard Deviation	2011	2012	2013	2014	2015	2016	2011-16 Average	2021	2031	2017-31 Average
Public sector debt 1/	16.1	40.2	39.2			42.0	43.1	41.8	40.4	40.0	40.3		43.9	42.2	
Of which : foreign-currency denominated	13.6	35.7	34.2			36.7	37.6	35.7	33.7	32.8	31.9		28.8	21.1	
Change in public sector debt	0.0	24.0	-1.0			2.8	1.1	-1.2	-1.4	-0.4	0.3		0.4	-0.7	
Identified debt-creating flows	-0.9	13.5	0.2			2.3	1.6	0.2	-0.3	-0.5	-0.4		-0.8	-1.1	
Primary deficit	1.5	7.1	4.6	2.5	2.0	2.4	1.9	1.1	0.8	0.8	0.8	1.8	0.6	0.3	0.6
Revenue and grants	20.5	20.9	20.7			21.7	21.1	21.2	21.5	21.7	21.9		22.7	24.7	
Of which: grants	0.4	0.7	1.2			1.7	0.4	0.3	0.2	0.2	0.2		0.1	0.0	
Primary (noninterest) expenditure	21.9	28.0	25.3			24.1	23.0	22.3	22.3	22.5	22.6		23.3	25.0	
Automatic debt dynamics	-1.5	6.4	-4.4			-0.1	-0.3	-0.9	-1.1	-1.3	-1.2		-1.4	-1.4	
Contribution from interest rate/growth differential	-1.3	2.7	-0.8			-1.4	-1.3	-1.4	-1.3	-1.2	-1.1		-1.3	-1.4	
Of which: contribution from average real interest rate	-0.2	0.1	0.0			0.4	0.3	0.3	0.3	0.3	0.4		0.3	0.3	
Of which: contribution from real GDP growth	-1.0	2.7	-0.8			-1.7	-1.6	-1.7	-1.6	-1.6	-1.5		-1.7	-1.6	
Contribution from real exchange rate depreciation	-0.2	3.6	-3.7			1.3	1.0	0.5	0.2	-0.1	-0.1		...	...	
Other identified debt-creating flows	-0.9	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Privatization receipts (negative)	-0.9	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Recognition of implicit or contingent liabilities	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Debt relief (HIPC and other)	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Other (specify, e.g. bank recapitalization)	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Residual, including asset changes 2/	1.0	10.6	-1.2			0.5	-0.5	-1.4	-1.1	0.1	0.7		1.2	0.5	
Other Sustainability Indicators															
PV of public sector debt	...	4.5	32.7			35.2	35.7	34.3	33.3	33.4	34.2		40.1	40.5	
Of which : foreign-currency denominated	...	0.0	27.8			30.0	30.3	28.1	26.5	26.1	25.8		24.9	19.4	
Of which : external	...	...	27.8			30.0	30.3	28.1	26.5	26.1	25.8		24.9	19.4	
PV of contingent liabilities (not included in public sector debt)	...	...	...			...	...	...	...	...	...		...	...	
Gross financing need 3/	4.2	11.2	9.8			6.2	7.6	8.3	7.2	6.4	6.8		10.0	12.3	
PV of public sector debt-to-revenue and grants ratio (in percent)	…	21.4	158.3			162.4	169.5	161.6	154.9	154.1	156.5		176.3	163.8	
PV of public sector debt-to-revenue ratio (in percent)	…	22.1	168.2			175.9	172.5	163.8	156.7	155.7	158.0		177.1	164.1	
Of which : external 4/	…	…	142.9			149.7	146.3	134.3	124.8	121.8	119.1		110.1	78.6	
Debt service-to-revenue and grants ratio (in percent) 5/	12.2	15.2	19.6			11.6	19.4	26.7	20.9	16.3	17.6		23.0	23.5	
Debt service-to-revenue ratio (in percent) 5/	12.5	15.7	20.8			12.5	19.8	27.0	21.1	16.5	17.8		23.1	23.5	
Primary deficit that stabilizes the debt-to-GDP ratio	1.4	-16.9	5.6			-0.4	0.8	2.3	2.2	1.2	0.5		0.2	1.0	
Key macroeconomic and fiscal assumptions															
Real GDP growth (in percent)	6.9	-14.1	2.1	8.3	8.8	4.6	4.0	4.0	4.0	4.0	4.0	4.1	4.0	4.0	4.0
Average nominal interest rate on forex debt (in percent)	0.8	1.7	1.5	0.8	0.6	1.8	2.0	2.0	1.8	1.7	1.8	1.8	2.6	3.7	2.9
Average real interest rate on domestic debt (in percent)	4.1	6.9	1.9	5.0	2.1	8.5	5.5	5.0	5.6	5.9	6.4	6.2	1.1	-0.5	0.8
Real exchange rate depreciation (in percent, + indicates depreciation)	-17.1	-1.8	24.7	-3.5	13.7	3.9	...	...	...	...	...	...	...	...	...
Inflation rate (GDP deflator, in percent)	5.9	2.6	9.2	4.7	2.0	5.7	4.8	4.5	4.0	4.0	4.0	4.5	4.0	4.0	4.0
Growth of real primary spending (deflated by GDP deflator, in percent)	0.1	0.1	-0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Grant element of new external borrowing (in percent)	...	...	...	…	…	19.6	21.6	16.5	9.1	6.1	5.2	13.0	0.6	-2.3	...

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

1/ Central government gross debt.
2/ Residuals include changes in gross foreign assets and valuation adjustments. For 2009, the large residual is mainly due to the on-lending activities. For projection also includes contribution from price and exchange rate changes.
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 3. Armenia: Sensitivity Analysis for Key Indicators of Public and Publicly-Guaranteed External Debt, 2011–31
(In percent)

	Projections							
	2011	2012	2013	2014	2015	2016	**2021**	2031
PV of debt-to-GDP+remittances ratio								
Baseline	28	28	26	25	24	24	**24**	19
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2011–31 1/	28	23	18	16	16	16	**14**	7
A2. New public sector loans on less favorable terms in 2011–31 2/	28	29	27	26	26	26	**28**	30
A3. Alternative Scenario : Nairit loan	28	30	29	28	27	27	**25**	19
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2012–31	28	29	28	27	26	26	**25**	20
B2. Export value growth at historical average minus one standard deviation in 2012–13 3/	28	30	32	31	30	30	**27**	19
B3. U.S. dollar GDP deflator at historical average minus one standard deviation in 2012–13	28	28	27	26	25	25	**24**	19
B4. Net nondebt creating flows at historical average minus one standard deviation in 2012–13 4/	28	29	30	28	28	28	**26**	19
B5. Combination of B1-B4 using one-half standard deviation shocks	28	26	24	23	22	22	**22**	17
B6. One-time 30 percent nominal depreciation relative to the baseline in 2012 5/	28	39	36	34	34	33	**32**	26
PV of debt-to-exports+remittances ratio								
Baseline	105	101	89	82	80	79	**75**	56
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2011–31 1/	105	82	63	56	56	57	**49**	24
A2. New public sector loans on less favorable terms in 2011–31 2/	105	102	93	87	86	86	**90**	88
A3. Alternative Scenario : Nairit loan	105	106	99	91	88	86	**79**	56
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2012–13	105	98	88	81	79	78	**74**	55
B2. Export value growth at historical average minus one standard deviation in 2012–13 3/	105	114	128	119	116	115	**102**	67
B3. U.S. dollar GDP deflator at historical average minus one standard deviation in 2012–13	105	98	88	81	79	78	**74**	55
B4. Net nondebt creating flows at historical average minus one standard deviation in 2012–13 4/	105	103	100	93	91	90	**82**	56
B5. Combination of B1-B4 using one-half standard deviation shocks	105	94	85	82	80	79	**75**	56
B6. One-time 30 percent nominal depreciation relative to the baseline in 2012 5/	105	98	88	81	79	78	**74**	55
PV of debt-to-revenue ratio								
Baseline	150	146	134	125	122	119	**110**	79
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2011–31 1/	150	116	91	79	78	79	**63**	31
A2. New public sector loans on less favorable terms in 2011–31 2	150	148	140	133	131	130	**133**	125
A3. Alternative Scenario : Nairit loan	150	154	149	138	135	131	**116**	79
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2012–13	150	149	144	134	131	128	**119**	85
B2. Export value growth at historical average minus one standard deviation in 2012–13 3/	150	153	164	155	151	148	**127**	79
B3. U.S. dollar GDP deflator at historical average minus one standard deviation in 2012–13	150	146	138	129	126	124	**114**	81
B4. Net nondebt creating flows at historical average minus one standard deviation in 2012–13 4/	150	151	152	143	139	136	**120**	79
B5. Combination of B1-B4 using one-half standard deviation shocks	150	136	121	113	111	109	**101**	72
B6. One-time 30 percent nominal depreciation relative to the baseline in 2012 5/	150	204	188	176	172	168	**155**	111

Table 3. Armenia: Sensitivity Analysis for Key Indicators of Public and Publicly-Guaranteed External Debt, 2011–31 (continued)
(In percent)

	Projections							
	2011	2012	2013	2014	2015	2016	**2021**	2031
Debt service-to-exports+remittances ratio								
Baseline	4	8	12	8	5	5	**7**	7
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2011–31 1/	4	7	10	6	3	3	**3**	2
A2. New public sector loans on less favorable terms in 2011–31 2/	4	8	13	8	5	5	**8**	11
A3. Alternative Scenario : Nairit loan	4	8	13	8	5	5	**8**	7
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2012–13	4	8	12	8	5	5	**7**	7
B2. Export value growth at historical average minus one standard deviation in 2012–13 3/	4	9	15	10	6	7	**11**	8
B3. U.S. dollar GDP deflator at historical average minus one standard deviation in 2012–13	4	8	12	8	5	5	**7**	7
B4. Net nondebt creating flows at historical average minus one standard deviation in 2012–13 4/	4	8	13	9	5	5	**8**	7
B5. Combination of B1-B4 using one-half standard deviation shocks	4	8	12	8	5	5	**7**	7
B6. One-time 30 percent nominal depreciation relative to the baseline in 2012 5/	4	8	12	8	5	5	**7**	7
Debt service-to-revenue ratio								
Baseline	5	12	19	12	7	7	**10**	10
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2011–31 1/	5	10	14	8	4	4	**4**	3
A2. New public sector loans on less favorable terms in 2011–31 2/	5	12	19	13	8	8	**12**	16
A3. Alternative Scenario : Nairit	5	12	19	13	7	8	**11**	10
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2012–13	5	12	20	13	8	8	**11**	10
B2. Export value growth at historical average minus one standard deviation in 2012–13 3/	5	12	19	13	8	8	**13**	10
B3. U.S. dollar GDP deflator at historical average minus one standard deviation in 2012–13	5	12	20	13	8	8	**11**	10
B4. Net nondebt creating flows at historical average minus one standard deviation in 2012–13 4/	5	12	19	13	8	8	**12**	10
B5. Combination of B1-B4 using one-half standard deviation shocks	5	11	17	11	7	7	**9**	9
B6. One-time 30 percent nominal depreciation relative to the baseline in 2012 5/	5	17	27	18	10	11	**15**	14
Memorandum item:								
Grant element assumed on residual financing (i.e., financing required above baseline) 6/	2	2	2	2	2	2	**2**	2

Sources: Armenian authorities; and Fund 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 nondebt 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.

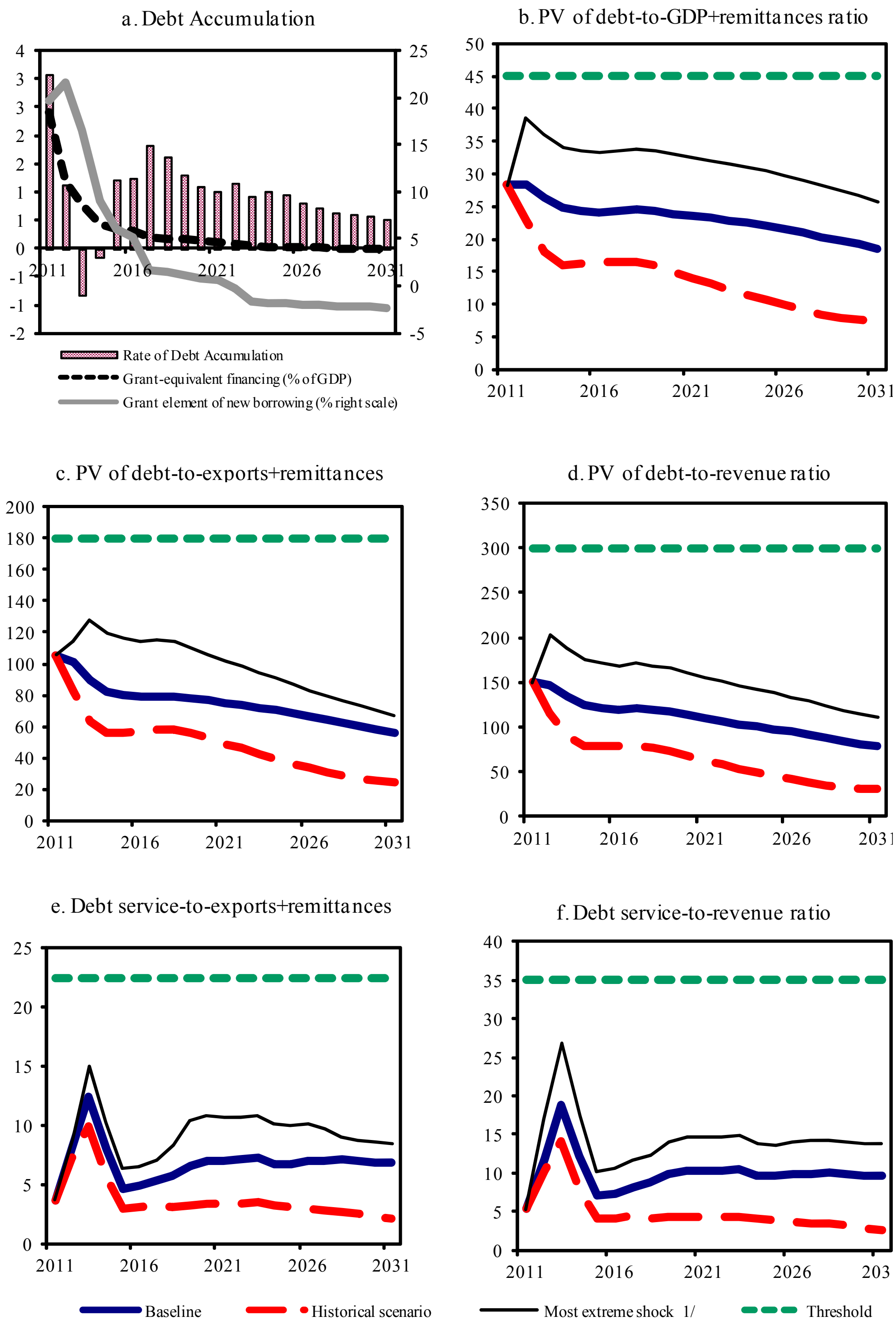
Table 4. Armenia: Sensitivity Analysis for Key Indicators of Public Debt 2011–31

	Projections							
	2011	2012	2013	2014	2015	2016	2021	2031
PV of Debt-to-GDP Ratio								
Baseline	35	36	34	33	33	34	40	40
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	35	35	34	33	34	35	41	43
A2. Primary balance is unchanged from 2011	35	36	36	37	38	41	54	69
A3. Permanently lower GDP growth 1/	35	37	37	38	40	44	72	162
A4. Alternative scenario: Nairit loan	35	37	37	36	36	37	41	40
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2012–13	35	38	40	41	43	46	61	79
B2. Primary balance is at historical average minus one standard deviations in 2012–13	35	38	40	39	39	40	45	45
B3. Combination of B1-B2 using one half standard deviation shocks	35	37	38	37	37	38	44	44
B4. One-time 30 percent real depreciation in 2012	35	49	48	46	46	47	53	56
B5. 10 percent of GDP increase in other debt-creating flows in 2012	35	46	44	43	43	43	48	47
PV of Debt-to-Revenue Ratio 2/								
Baseline	162	169	162	155	154	156	176	164
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	162	166	159	155	156	160	180	174
A2. Primary balance is unchanged from 2011	162	172	170	170	176	185	238	279
A3. Permanently lower GDP growth 1/	162	174	173	175	184	199	316	655
A4. Alternative Scenario: Nairit loan	162	177	176	168	167	169	182	164
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2012–13	162	181	190	191	199	210	269	318
B2. Primary balance is at historical average minus one standard deviations in 2012–13	162	182	190	183	181	183	199	181
B3. Combination of B1-B2 using one half standard deviation shocks	162	177	181	174	173	175	193	179
B4. One-time 30 percent real depreciation in 2012	162	235	224	215	213	214	232	225
B5. 10 percent of GDP increase in other debt-creating flows in 2012	162	217	208	200	198	199	213	192
Debt Service-to-Revenue Ratio 2/								
Baseline	12	19	27	21	16	18	23	24
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	12	19	25	19	15	16	19	19
A2. Primary balance is unchanged from 2011	12	19	27	21	17	19	27	34
A3. Permanently lower GDP growth 1/	12	20	28	22	18	20	33	65
A4. Alternative Scenario : Nairit loan	12	20	27	21	17	18	24	24
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2012–13	12	20	29	23	19	21	30	38
B2. Primary balance is at historical average minus one standard deviations in 2012–13	12	19	27	22	18	19	26	25
B3. Combination of B1-B2 using one half standard deviation shocks	12	19	27	22	17	18	25	25
B4. One-time 30 percent real depreciation in 2012	12	22	35	27	20	22	31	34
B5. 10 percent of GDP increase in other debt-creating flows in 2012	12	19	29	23	18	19	27	27

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

1/ Assumes that real GDP growth is at baseline minus one standard deviation divided by the square root of the length of the projection period.
2/ Revenues are defined inclusive of grants.

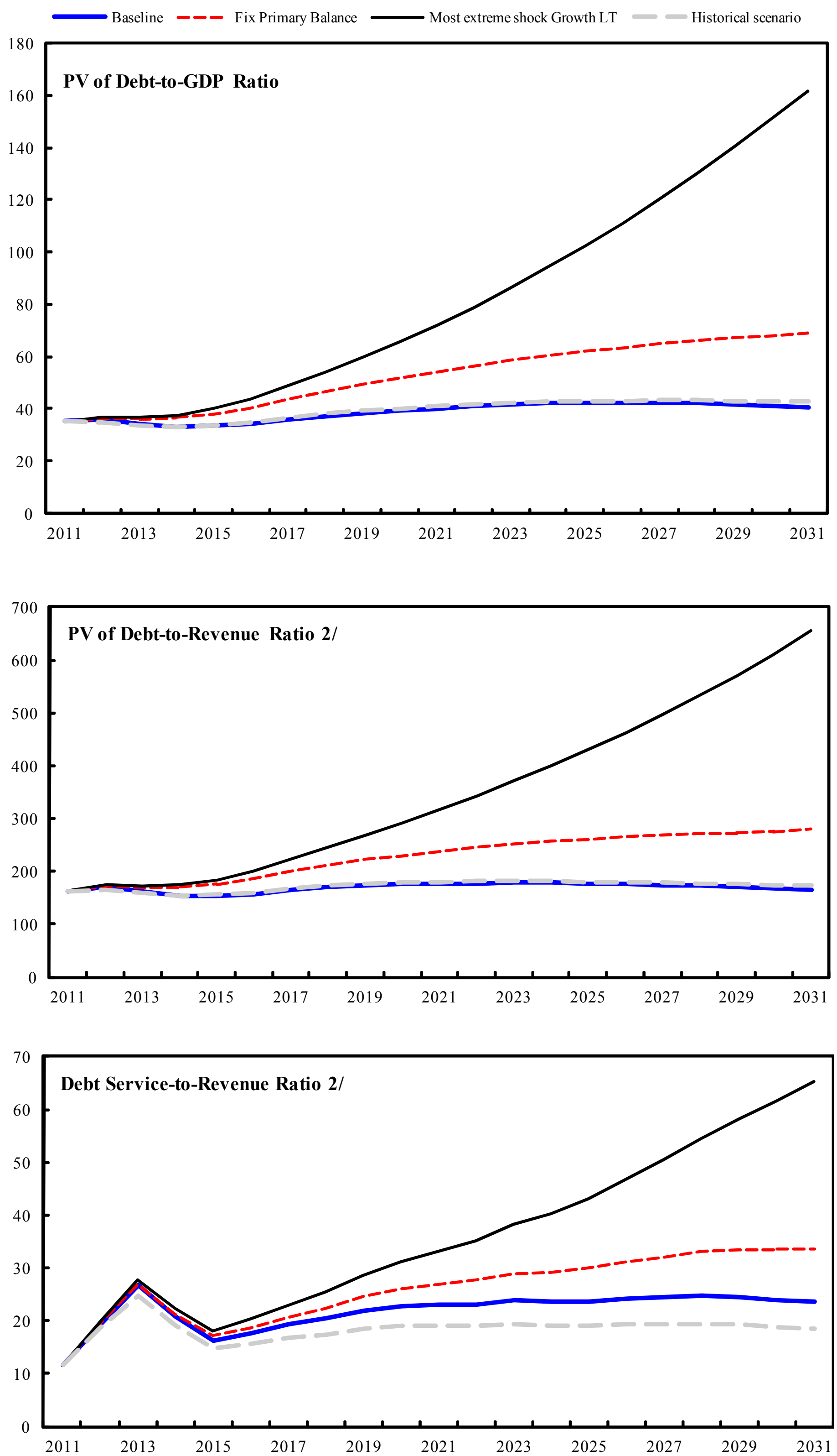
Figure 1. Armenia: Indicators of Public and Publicly Guaranteed External Debt under Alternatives Scenarios, 2011-2031 1/



Sources: Country authorities; and staff estimates and projections.

1/ The most extreme stress test is the test that yields the highest ratio in 2021. In figure b. it corresponds to a One-time depreciation shock; in c. to a Exports shock; in d. to a One-time depreciation shock; in e. to a Exports shock and in figure f. to a One-time depreciation shock

Figure 2. Armenia: Indicators of Public Debt Under Alternative Scenarios, 2011-2031 1/



Sources: Country authorities; and staff estimates and projections.

1/ The most extreme stress test is the test that yields the highest ratio in 2021.

2/ Revenues are defined inclusive of grants.