INTERNATIONAL MONETARY FUND

KYRGYZ REPUBLIC

Joint World Bank/IMF Debt Sustainability Analysis

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

Approved by David Owen and Scott Brown (IMF) and
Cheryl Gray and Mark Thomas (World Bank)

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The staff's low-income country debt sustainability analysis (LIC DSA) suggests that the Kyrgyz Republic's external debt continues to pose a burden on public finances. Furthermore, despite improvements in debt indicators since the timing of the last LIC DSA—upgrading the country to moderate risk of debt distress—the debt outlook remains vulnerable to exogenous shocks reversals of the prudent macroeconomic policies of recent years or slower structural reforms.[1] *Ensuring that debt indicators remain on a downward path will require that strong and sustained GDP and exports growth be complemented by careful debt management and donor support on concessional terms.*

The DSA presented here was prepared jointly by Fund and World Bank staffs in consultation with the authorities, using the joint Bank-Fund Low-Income Country Debt Sustainability Framework (LIC DSF). The data on stock of external debt for end-2006 provided by the authorities were checked by staff for consistency against the end-2005 loan-by-loan debt figures reconciled earlier with the creditor information. The macroeconomic assumptions reflect the framework underlying the current PRGF–supported program and staff projections through 2027. They have been updated to incorporate recent developments and changes to the medium-term outlook, but long-term projections were kept similar to the framework used in the last LIC DSA.

The framework assumes continuation of sound macroeconomic policies—including fiscal consolidation and prudent public debt management—as a basis for sustaining growth (Box 1). Further, growth would be underpinned by firm implementation of structural

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[1] The 2006 LIC DSA was prepared in the context of the 2006 Article IV consultation (Country Report No. 07/135).

reforms outlined in the Country Development Strategy (CDS) to remove impediments to private investment and stimulate economic diversification. In addition, the framework factors

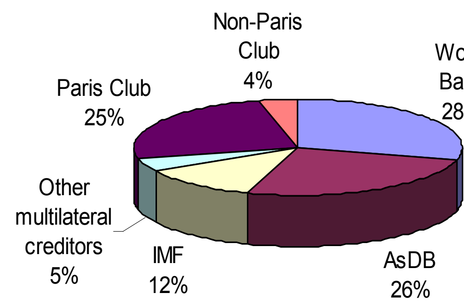
in the recent increase in reserves of the Kumtor goldmine and assumes that continued benign economic conditions in neighboring Russia, Kazakhstan, and China would help maintain export growth and the flow of remittances. The framework features average long-run GDP growth of 4½ percent on the back of robust exports growth, reflecting strong private investments spurred by improvements in business climate. The external current account deficit is slated for a steady improvement from a projected 18 percent of GDP in 2007 to 7 percent in 2027 and will continue to be financed primarily by private capital inflows, including FDI.

Macroeconomic assumptions underlying previous DSAs (excluding the 2006 LIC DSA) did not materialize.[2] Because of the political events of March 2005 and the serious accident at the Kumtor gold mine in 2006, the 2004–06 GDP growth (annual average 3.2 percent) was weaker than the earlier projected figure of 5.6 percent. However, staff's forecast of exports and fiscal revenues proved conservative. Exports exceeded projections because strong external demand propped up nongold exports while higher gold price helped offset the sharp decline in gold output in 2006. Overperformance in revenues was the result of recent improvements in tax and customs administration. Furthermore, the som appreciated against the U.S. dollar faster than projected, contributing, along with the March 2005 Paris Club rescheduling agreement, to substantially lower debt ratios by end-2006 than anticipated at the time of earlier DSAs.

Structure of external debt

The Kyrgyz Republic's nominal stock of public and publicly guaranteed external debt declined from 78 percent of GDP in 2005 to 70 percent in 2006. In present value terms, this is equivalent to $1,257 million (44½ percent of GDP), of which 71 percent is owed to IFIs and the remaining 29 percent to bilateral creditors. Following the March 2005 Paris Club rescheduling, the authorities have reached debt restructuring agreements with all Paris Club

Kyrgyz Republic: NPV of external debt (Total: 1,257 million, end-2006).

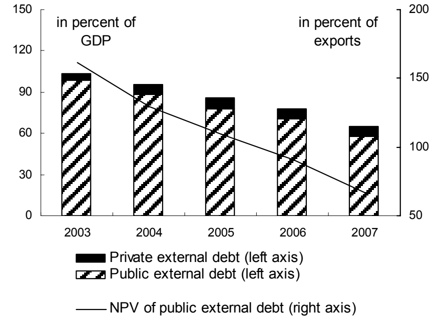


[2] The assessment has been carried out in response to the Board's endorsement of the staff's recommendations on adapting the LIC DSF in a joint IMF/World Bank policy paper (Applying the Debt Sustainability Framework for Low-Income Countries Post Debt Relief, November 6, 2006 (www.imf.org)). It is based on LIC DSAs prepared by the Fund staff for the 2004 Article IV consultation staff report (Country Report No. 05/47) and the request for the ongoing PRGF arrangement (Country Report No. 05/119).

creditors, which granted 40 percent NPV reduction on most loans. However, despite the authorities' best efforts, agreements remain to be reached with a number of official bilateral creditors.

External debt ratios have improved considerably over the past few years. The public external debt-to-GDP ratio has declined from a little under 100 percent in 2003 to 70 percent in 2006, while the NPV of the same debt to exports fell even more sharply, from 162 percent in 2003 to 91 percent in 2006. The decline in the ratios—notwithstanding the moderate real GDP growth—has been mainly the result of high growth of exports and U.S. dollar nominal GDP. The external private debt ratio decreased in the early 2000s, but picked up in 2006 to about 8 percent of GDP, a trend staff expects to continue in the near future.

Kyrgyz Republic: Debt Indicators, 2003-07.



External debt sustainability

While the assumptions outlined in Box 1 underpin the baseline projections of debt sustainability indicators, staff conducted a series of stress tests to assess their sensitivity to less favorable scenarios. In addition to standard bound and stress tests embedded in the LIC DSA template, staff developed two Kyrgyz-specific alternative scenarios. Recognizing the key role of gold in exports, the first scenario gauges the impact on debt indicators of the permanently lower gold price throughout the projection period. In particular, it assumes that the price starts to diverge from the baseline path in 2008, deviating by as much as 25 percent from 2010 onwards. The scenario accounts for the second-round effects by assuming a slowdown in growth and FDI and slower currency appreciation in 2008–10. The second scenario assumes that the reduction in retirement age, initiated in 2007, will not be reversed and will remain effective throughout the DSA horizon, resulting in an average annual pension expenditure growth of 11 percent from 2009 to 2027.[3] The additional financing needs would amount to ½ percent of GDP in 2009, rising steadily to more than 1½ percent of GDP by 2027.[4]

As noted below, the current debt burden places the Kyrgyz Republic at a moderate risk of debt distress. Nevertheless, the baseline scenario points to a cautiously favorable improvement in the external debt outlook over time. Already by end-2006, the NPV of debt-to-exports and the NPV of debt-to-revenue ratios, at 90¾ and 204 percent respectively, were

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[3] This scenario can also be interpreted as reflecting the impact of a loose fiscal policy.

[4] According to the recently adopted law, the retirement age is being gradually reduced from 63 to 60 years old for men and 58 to 55 for women. Concerned with fiscal implications, the government has drawn plans to stop the reduction in the retirement age in 2008 by asking parliament to nullify the law or challenging it in the Constitutional Court. The staff's baseline scenario assumes that the law will be nullified or a pension reform to put the pension system on a sustainable footing will be implemented with the assistance of the World Bank.

well below their policy-based indicative thresholds.[5] Only the NPV of debt-to-GDP ratio is slightly above its relevant threshold of 40 percent in 2006, but by end-2007 it too is projected to fall below that mark. Over the DSA horizon, all sustainability ratios move steadily on a downward path underpinned by strong growth, fiscal consolidation, and prudent debt management. With the anticipated closure of the Kumtor gold mine in 2014–15, the ratios, particularly in relation to exports, would increase somewhat around that time, but would eventually fall back below the preclosure levels.

Debt service is expected to remain manageable throughout the DSA horizon. This reflects the high concessionality of both the outstanding multilateral debt and the new borrowing, as well as the debt relief delivered by Paris Club creditors in 2005. In sum, the debt service would average 3½ percent of exports (7½ percent of revenues) in the medium term, but hover at 5¼ percent of exports (10 percent of revenues) during the later stage of the projection period, driven by less concessional new borrowing and the repayment of the previously restructured bilateral debt.

Stress tests and alternative scenarios show the Kyrgyz Republic's debt sustainability as vulnerable to large shocks or less favorable assumptions. The NPV of debt-to-GDP ratio rises and stays above the threshold under many tests, while the NPV of debt-to-revenue is especially sensitive to assumptions on export growth, projections of nondebt creating inflows, and a combination of four standard tests (B5), breaching the respective threshold over the DSA horizon. However, the NPV of debt-to-exports ratio is particularly robust and breaches its threshold only under the combination test (B5). Debt service ratios prove relatively more resilient too, staying below their indicative levels in most cases. As with the solvency ratios, the combination of four standard tests (B5) has the most adverse impact on the debt service indicators. The additional country-specific scenario (A3) designed by staff shows that the debt situation would worsen in the event of a sharp permanent fall in gold price, but would nonetheless remain manageable. While all sustainability indicators deteriorate over the medium term, only the NPV of debt-to-GDP ratio would breach, albeit only briefly, the threshold. Similarly, the failure to reform the pension system (A4) would lead to a serious deterioration of debt ratios in the long term. However, only the NPV of debt-to-GDP ratio would exceed the threshold. Despite the sensitivity of the debt burden outlook to unfavorable conditions as evidenced from stress tests and alternative scenarios, staff's baseline assumptions appear realistic. The historical scenario—where key macro variables evolve according to their historic averages—points to a more benign debt outlook than the baseline scenario.

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[5] The Kyrgyz Republic is rated as a *medium performer* based on the World Bank's Country Performance and Institutional Assessment Index. The relevant policy-dependent thresholds are 40 percent for the NPV of the debt-to-GDP ratio, 150 percent for the NPV of debt-to-exports ratio, 250 percent for the NPV of debt-to-revenue ratio, 20 percent of the debt service-to-exports ratio, and 30 percent of the debt service-to-revenue ratio.

Box 1. Macroeconomic Assumptions 2007–27.

Annual real GDP growth would average 4½ percent, on the back of strong private investment, including FDI, spurred by improvements in business climate. The strong growth in the near term will be supported by a rebound in mining and the initial impact of reforms in the energy sector, while tourism-related services and a reformed energy sector would underpin measured but sustained long-run growth. Consistent with the assumption of conservative fiscal and monetary policies, long-term inflation would average 4 percent.

Following an accident in the Kumtor gold mine in 2006, **exports are slated to recover, growing by an average of 12 percent a year in the near term.** In addition to normalization of Kumtor operations, this recovery would be underpinned by the start of mining in other major gold deposits and robust import demand from Russia and Kazakhstan, particularly for industrial and processed food products. As this growth pattern would keep exports vulnerable to a depletion of mining deposits, a sharp drop in world commodity prices, and natural disasters, export diversification efforts need to be directed to creating an enabling business environment to exploit the considerable export potential, particularly in tourism and hydroenergy. Long run projections assume that a sharp drop in gold output from the expected closure of the Kumtor mine in 2014–2015 will be moderated by gains in the tourism and energy sectors. In all, **annual exports volume growth would average 5¼ percent over the DSA period, stabilizing at 5 percent by 2027.**

Consistent with growth projections and expected FDI inflows, imports volume would grow at 4¾ percent a year. They would continue to be sourced mainly from CIS trading partners and China, with oil products and consumer goods dominating the commodity structure.

The current account deficit is projected to narrow from projected 18 percent of GDP in 2007 to 7 percent in 2027. Buoyed by strong income growth in Russia and Kazakhstan, private transfers—mainly worker's remittances amounting to 25 percent of GDP in 2006—will remain large, financing a significant share of the trade deficit. In the long-run, a projected narrowing in the current account deficit would be supported by fiscal consolidation and increased private savings.

Net FDI would remain stable at around 5 percent of GDP throughout the projection period. While in the near term FDI would be concentrated in traditional sectors, like mining and industry, business climate improvements should yield a more diversified structure of FDI in the outer years. The foreign loan-financed part of the Public Investment Program would initially decline from 2.2 percent of GDP at present to 1¾ percent of GDP in 2013, but will then pick up to return to the current levels by 2027. International reserves would be kept at 4 months of imports.

Medium-term public borrowing—to finance the Public Investment Program and fill financing gaps—will be on highly concessional terms, primarily from IFIs. Over the DSA horizon, concessionality of new external public borrowing would gradually decline from around 45 percent in 2007–2012 to 18 percent in 2017–2027, as more borrowing will be contracted at less concessional terms from bilateral and commercial creditors.

The primary deficit is projected somewhat above 1 percent of GDP in 2007–2012, but will decline gradually, stabilizing around ½ percent of GDP over the long term. State government revenues (excluding grants) are projected at around 24½ percent of GDP in 2007–2011 and would remain broadly unchanged with respect to GDP.

Debt service is expected to remain manageable throughout the DSA horizon. This reflects the high concessionality of both the outstanding multilateral debt and the new borrowing, as well as the debt relief delivered by Paris Club creditors in 2005. In sum, the debt service would average 3½ percent of exports (7½ percent of revenues) in the medium term, but hover at 5¼ percent of exports (10 percent of revenues) during the later stage of the projection period, driven by less concessional new borrowing and the repayment of the previously restructured bilateral debt.

Stress tests and alternative scenarios show the Kyrgyz Republic's debt sustainability as vulnerable to large shocks or less favorable assumptions. The NPV of debt-to-GDP ratio rises and stays above the threshold under many tests, while the NPV of debt-to-revenue is especially sensitive to assumptions on export growth, projections of nondebt creating inflows, and a combination of four standard tests (B5), breaching the respective threshold over the DSA horizon. However, the NPV of debt-to-exports ratio is particularly robust and breaches its threshold only under the combination test (B5). Debt service ratios prove relatively more resilient too, staying below their indicative levels in most cases. As with the solvency ratios, the combination of four standard tests (B5) has the most adverse impact on the debt service indicators. The additional country-specific scenario (A3) designed by staff shows that the debt situation would worsen in the event of a sharp permanent fall in gold price, but would nonetheless remain manageable. While all sustainability indicators deteriorate over the medium term, only the NPV of debt-to-GDP ratio would breach, albeit only briefly, the threshold. Similarly, the failure to reform the pension system (A4) would lead to a serious deterioration of debt ratios in the long term. However, only the NPV of debt-to-GDP ratio would exceed the threshold. Despite the sensitivity of the debt burden outlook to unfavorable conditions as evidenced from stress tests and alternative scenarios, staff's baseline assumptions appear realistic. The historical scenario—where key macro variables evolve according to their historic averages—points to a more benign debt outlook than the baseline scenario.

Low-concessionality loans from bilateral creditors to finance large public investment projects continue to pose risk to the debt sustainability outlook. Although the government has on many occasions reconfirmed its policy not to attract external loans with the grant element below 45 percent, influential political leaders and interest groups may advocate exceptions from the rule for "strategic" projects. Staff recognizes that the Kyrgyz Republic has large developmental needs, but considers paramount to lock in the recent progress in achieving debt sustainability. Even if the loans were to meet the 45 percent concessionality threshold, it would be important to ensure that the underlying projects are viable and market risks, including exchange rate risk, are accounted for, so as to safeguard debt sustainability.

Public debt sustainability

External debt will continue to account for more than 90 percent of total public debt. Thus, as a percent of GDP, the drop in external debt will explain most of the change in the nominal stock of public debt which falls from 76 percent in 2006 to 30 percent in 2027. Domestic debt consists of treasury paper, and foreign exchange-denominated loans, which account for 48 percent, 28 percent, and 24 percent of total domestic public debt in 2006, respectively.

Public debt sustainability is expected to improve considerably due to progress in tax and customs administration, as well as fiscal consolidation from reforms in the pension system and the civil service. Compared to the last DSA, there have already been significant improvements in public debt ratios in 2007 stemming from unanticipated revenue overperformance in import-related collections in the first three-quarter of the year. This revenue source is assumed to remain broadly stable as a share of GDP after 2008. Still, expenditure control will take up the slack in the medium term when pension and civil service reforms are expected to take effect. All in all, the DSA assumes a fiscal consolidation of around ¾ percent of GDP from 2007 to 2027. In the baseline scenario, the NPV of public debt-to-GDP is 42 percent in 2007 and drops to 25 percent in 2027. Meanwhile, the baseline ratio of NPV of debt-to-revenue declines from 157 percent in 2007 to 96 percent in 2027 and the baseline ratio of debt service-to-revenue ratio stays low at 9 percent in 2007 and 11 percent in 2027. Debt levels are however vulnerable to combined shocks to the economy; if real GDP growth and the primary balance are at historical averages, the NPV of debt-to-GDP ratio rises steadily from 42 percent in 2007 to 82 percent in 2027. The NPV of debt-to-revenue ratio also increases to 322 percent by 2027.

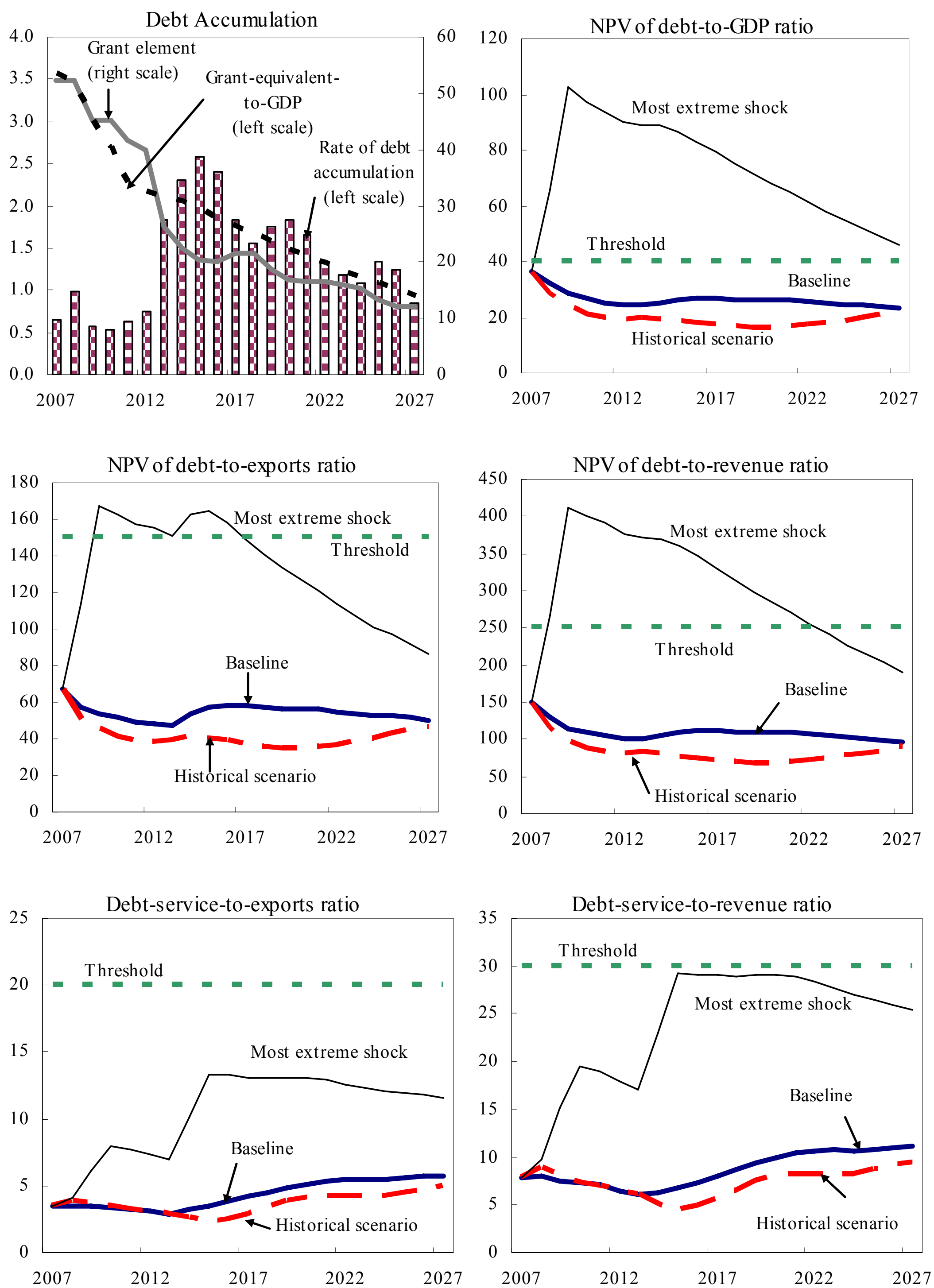
Debt distress classification

The Kyrgyz Republic is assessed to be at moderate risk of debt distress because, starting in 2007, all external debt indicators in the baseline are projected to stay below the indicative threshold over the DSA horizon.[6] At 44 percent, only the NPV of external public debt-to-GDP ratio stands slightly above its indicative threshold of 40 percent at end-2006, but it is forecast to fall below the mark in 2007. Moreover, under the baseline scenario, the debt service burden would remain well below the thresholds, reflecting the high concessionality of the external debt. Nevertheless, alternative scenarios and stress tests show that the external public debt indicators would approach or breach the thresholds if the Kyrgyz Republic were to experience an adverse exogenous shock or relax its prudent debt management policy.

[6] This classification is based on the guidelines set out in a joint IMF/World Bank policy paper (Operational Framework for Debt Sustainability Assessments in Low-Income Countries—Further Considerations (www.imf.org)).

If the debt classification were instead based on total public debt (not solely on external public debt), it would be downgraded to the high risk category of debt distress even though the total domestic debt accounts roughly to 10 percent of total public deb**t.** The assessment in this DSA is based on comparing external debt indicators to the LIC DSF indicative thresholds that apply only to the external component of public debt. When domestic public debt is included, the baseline points to a less pronounced decline in ratios; in particular, the NPV of debt-to-GDP ratio remains above its threshold longer.

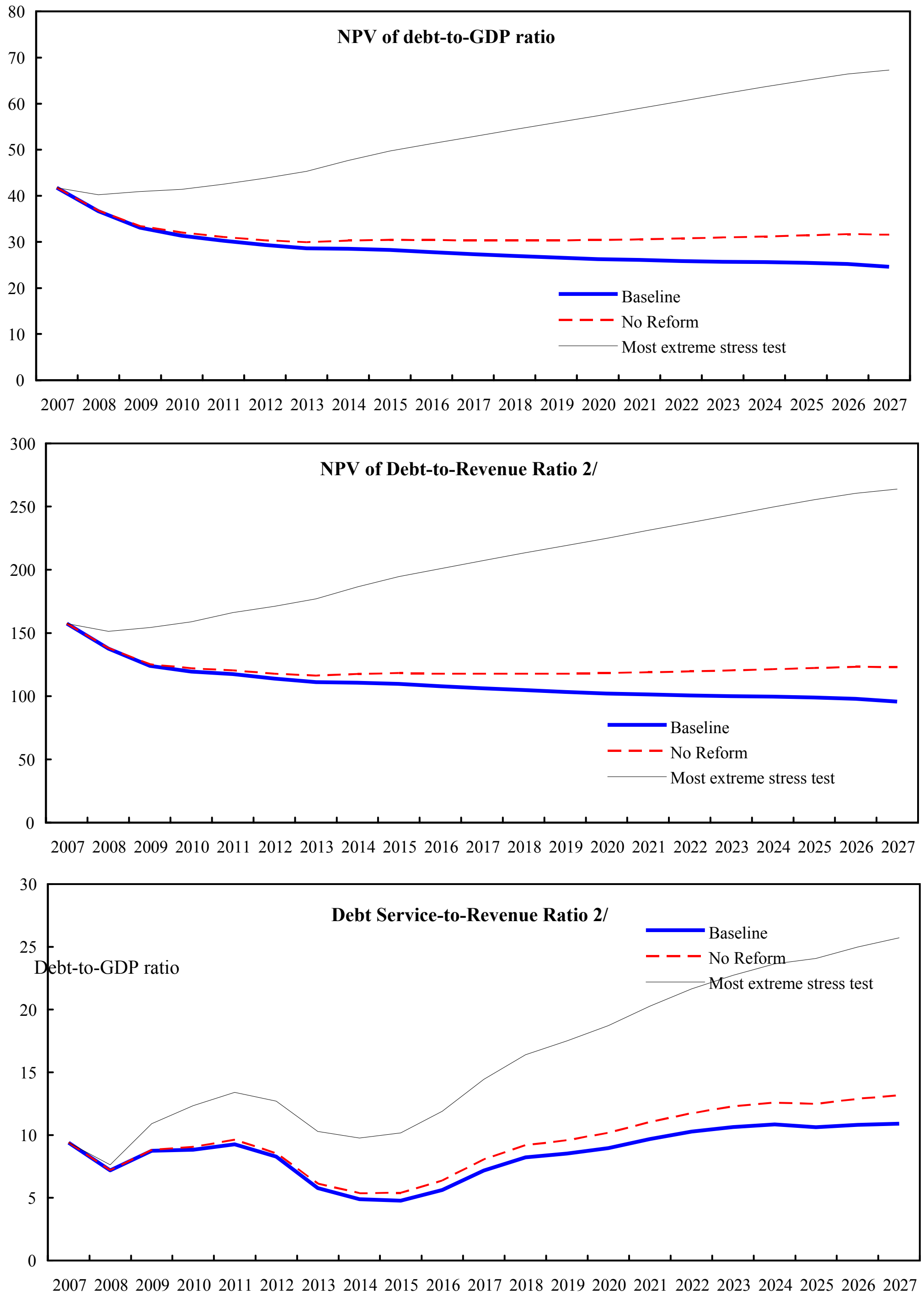
Figure 1. Kyrgyz Republic: Indicators of Public and Publicly Guaranteed External Debt Under Alternative Scenarios, 2007-2027 1/



Source: Staff projections and simulations.

1/ Most extreme shock is shock that yields highest ratio in 2017.

Figure 2. Kyrgyz Republic: Indicators of Public Debt Under Alternative Scenarios, 2007–2027 1/



Source: Staff projections and simulations.
1/ Most extreme stress test is test that yields highest ratio in 2017.
2/ Revenue including grants.

Table 1. Kyrgyz Republic: External Debt Sustainability Framework, Baseline Scenario, 2004-2027 1/
(In percent of GDP, unless otherwise indicated)

	Actual			Historical Average 7/	Standard Deviation 7/	Projections									
	2004	2005	2006			2007	2008	2009	2010	2011	2012	2007-12 Average	2017	2027	2013-27 Average
External debt (nominal) 1/	95.1	85.5	78.1			65.1	57.7	51.1	46.8	44.0	41.6		41.5	34.0	
o/w public and publicly guaranteed (PPG)	88.4	78.0	70.2			57.7	50.5	44.3	41.2	38.7	36.7		36.1	28.0	
Change in external debt	-8.3	-9.6	-7.4			-13.1	-7.4	-6.5	-4.3	-2.8	-2.3		-0.7	-1.1	
Identified net debt-creating flows	-24.6	-14.3	-10.8			6.8	5.5	2.8	1.3	-0.1	-0.4		2.2	0.6	
Non-interest current account deficit	-6.6	-4.6	5.9	2.3	7.8	17.1	14.3	10.3	8.1	6.3	5.6		7.6	5.5	6.6
Deficit in balance of goods and services	4.7	14.1	30.8			42.3	36.5	30.1	27.5	25.1	23.9		24.6	19.5	
Exports	46.2	42.7	49.1			54.6	56.2	53.1	52.0	51.5	50.4		46.2	46.2	
Imports	50.9	56.8	79.8			96.9	92.7	83.3	79.5	76.6	74.3		70.7	65.7	
Net current transfers (negative = inflow)	-14.2	-20.3	-25.4	-10.0	7.6	-26.2	-23.6	-21.4	-20.9	-20.5	-20.0		-18.7	-15.8	-17.8
o/w official	-1.1	-0.9	-0.4			-1.0	-0.8	-0.6	-0.7	-0.7	-0.6		-0.5	-0.3	
Other current account flows (negative = net inflow)	2.9	1.6	0.6			1.0	1.3	1.5	1.5	1.7	1.7		1.7	1.8	
Net FDI (negative = inflow)	-5.9	-1.7	-6.5	-2.9	2.6	-6.4	-5.7	-5.2	-4.9	-4.9	-4.8		-5.0	-5.0	-5.0
Endogenous debt dynamics 2/	-12.1	-7.9	-10.3			-4.0	-3.1	-2.3	-1.9	-1.5	-1.2		-0.5	0.1	
Contribution from nominal interest rate	1.7	1.5	0.6			0.7	0.9	1.0	0.9	0.9	0.9		1.3	1.5	
Contribution from real GDP growth	-6.3	0.1	-2.0			-4.7	-3.9	-3.3	-2.8	-2.4	-2.0		-1.8	-1.4	
Contribution from price and exchange rate changes	-7.5	-9.5	-9.0			...	...	...	...	...	...		...	...	
Residual (3-4) 3/	16.4	4.8	3.4			-19.8	-13.0	-9.3	-5.6	-2.8	-1.9		-2.9	-1.6	
o/w exceptional financing	-2.1	-1.8	-0.2			0.0	0.1	0.0	0.0	0.0	0.0		0.0	0.0	
NPV of external debt 4/	66.3	54.1	52.5			43.9	39.4	35.3	32.3	30.6	29.2		32.1	29.2	
In percent of exports	143.6	126.8	106.9			80.5	70.1	66.4	62.1	59.4	57.9		69.5	63.2	
NPV of PPG external debt	59.6	46.5	44.5			36.6	32.2	28.5	26.7	25.3	24.2		26.7	23.1	
In percent of exports	129.1	109.1	90.7			67.0	57.3	53.6	51.4	49.1	48.0		57.9	50.1	
In percent of government revenues 5/	319.4	235.1	203.6			149.4	130.8	114.5	109.6	105.8	101.2		111.5	95.9	
Debt service-to-exports ratio (in percent)	8.7	7.8	5.7			4.6	5.1	5.9	8.4	6.6	6.7		8.9	12.4	
PPG debt service-to-exports ratio (in percent)	5.9	6.5	4.7			3.5	3.5	3.5	3.4	3.3	3.1		4.2	5.8	
PPG debt service-to-revenue ratio (in percent) 5/	14.7	14.1	10.5			7.8	8.0	7.5	7.3	7.1	6.5		8.0	11.1	
Total gross financing need (billions of U.S. dollars)	0.2	0.1	0.1			0.1	0.1	0.1	0.2	0.2	0.2		0.4	0.8	
Non-interest current account deficit that stabilizes debt ratio	1.7	4.9	13.3			30.2	21.7	16.8	12.4	9.1	7.9		8.3	6.5	
Key macroeconomic assumptions															
Real GDP growth (in percent)	7.0	-0.2	2.7	4.8	4.8	7.5	7.0	6.5	6.0	5.5	5.0	6.3	4.5	4.3	4.2
GDP deflator in US dollar terms (change in percent)	7.8	11.2	11.7	1.3	13.4	15.0	9.0	8.0	2.5	2.5	2.5	6.6	2.5	2.5	2.5
Effective interest rate (percent) 6/	1.8	1.7	0.9	2.7	1.5	1.2	1.5	1.9	2.0	2.0	2.1	1.8	3.2	4.6	3.6
Growth of exports of G&S (US dollar terms, in percent)	24.2	2.5	32.0	10.5	16.0	37.4	20.1	8.7	6.2	7.2	5.3	14.2	8.1	6.7	6.2
Growth of imports of G&S (US dollar terms, in percent)	27.7	23.9	61.3	11.0	26.5	50.0	11.6	3.3	3.7	4.2	4.4	12.9	6.4	6.0	5.9
Grant element of new public sector borrowing (in percent)	...	...	...	...	...	52.2	52.5	45.3	45.3	41.6	39.8	46.1	21.7	12.1	18.0
Aid flows (in billions of US dollars) 8/	0.1	0.1	0.1			0.2	0.2	0.2	0.2	0.2	0.2		0.2	0.1	
o/w Grants	0.0	0.0	0.0			0.1	0.1	0.1	0.1	0.1	0.1		0.1	0.1	
o/w Concessional loans	0.1	0.1	0.1			0.1	0.1	0.1	0.1	0.1	0.1		0.1	0.1	
Grant-equivalent financing (in percent of GDP) 9/	...	...	...			3.6	3.4	3.0	2.7	2.3	2.2		1.7	0.9	1.5
Grant-equivalent financing (in percent of external financing) 9/	...	...	...			75.1	75.9	76.4	74.3	69.4	67.4		43.5	29.2	37.6
Memorandum items:															
Nominal GDP (billions of US dollars)	2.2	2.5	2.8			3.5	4.1	4.7	5.1	5.5	5.9		8.1	15.8	
(NPVt-NPVt-1)/GDPt-1 (in percent)						0.7	1.0	0.6	0.5	0.6	0.7	0.7	1.8	0.8	1.6

Source: Staff simulations.

1/ Includes both public and private sector external debt.

2/ 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.

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

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

5/ State government revenues excluding grants.

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

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

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

9/ 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 . Kyrgyz Republic: Sensitivity Analyses for Key Indicators of Public and Publicly Guaranteed External Debt, 2007-27
(In percent)

	Projections							
	2007	2008	2009	2010	2011	2012	2017	2027
NPV of debt-to-GDP ratio								
Baseline	36.6	32.2	28.5	26.7	25.3	24.2	26.7	23.1
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2008-27 1/	36.6	28.8	24.0	21.1	19.7	19.1	17.2	21.5
A2. New public sector loans on less favorable terms in 2008-27 2/	36.6	38.7	39.0	40.9	40.8	40.5	52.0	61.5
A3. Terms-of-trade shock (sharp decline in gold prices)	36.6	32.3	30.6	32.4	35.1	38.9	42.3	30.5
A4. Failure to reform the pension system	36.6	32.2	28.9	27.8	27.0	26.7	34.0	40.8
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2008-09	36.6	34.5	32.5	30.5	28.8	27.6	30.5	26.4
B2. Export value growth at historical average minus one standard deviation in 2008-09 3/	36.6	42.2	51.6	48.9	46.7	45.0	42.1	27.9
B3. US dollar GDP deflator at historical average minus one standard deviation in 2008-09	36.6	39.9	43.5	40.8	38.6	36.9	40.8	35.3
B4. Net non-debt creating flows at historical average minus one standard deviation in 2008-09 4/	36.6	54.4	68.5	65.1	62.4	60.2	53.2	31.2
B5. Combination of B1-B4 using one-half standard deviation shocks	36.6	65.6	102.5	97.5	93.4	90.2	79.2	45.7
B6. One-time 30 percent nominal depreciation relative to the baseline in 2008 5/	36.6	44.4	39.3	36.9	34.9	33.4	36.9	31.9
NPV of debt-to-exports ratio								
Baseline	67.0	57.3	53.6	51.4	49.1	48.0	57.9	50.1
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2007-26 1/	67.0	51.3	45.1	40.6	38.3	37.8	37.3	46.7
A2. New public sector loans on less favorable terms in 2007-26 2/	67.0	68.9	73.4	78.7	79.2	80.3	112.6	133.1
A3. Terms-of-trade shock (sharp decline in gold prices)	67.0	58.5	58.6	62.2	65.0	69.8	78.2	55.9
A4. Failure to reform the pension system	67.0	57.3	54.3	53.4	52.5	52.9	73.7	88.4
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2008-09	67.0	57.3	53.6	51.4	49.1	48.0	57.9	50.1
B2. Export value growth at historical average minus one standard deviation in 2008-09 3/	67.0	95.4	141.9	137.6	132.6	130.4	133.4	88.3
B3. US dollar GDP deflator at historical average minus one standard deviation in 2008-09	67.0	57.3	53.6	51.4	49.1	48.0	57.9	50.1
B4. Net non-debt creating flows at historical average minus one standard deviation in 2008-09 4/	67.0	96.7	128.8	125.3	121.1	119.3	115.2	67.7
B5. Combination of B1-B4 using one-half standard deviation shocks	67.0	113.6	167.5	163.0	157.5	155.3	148.9	85.9
B6. One-time 30 percent nominal depreciation relative to the baseline in 2008 5/	67.0	57.3	53.6	51.4	49.1	48.0	57.9	50.1
NPV of debt-to-revenue ratio 6/								
Baseline	149.4	130.8	114.5	109.6	105.8	101.2	111.5	95.9
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2007-26 1/	149.4	117.1	96.4	86.6	82.4	79.8	71.8	89.4
A2. New public sector loans on less favorable terms in 2007-26 2/	149.4	157.2	156.9	167.8	170.7	169.2	216.8	255.1
A3. Terms-of-trade shock (sharp decline in gold prices)	149.4	130.8	123.7	130.2	139.6	150.6	162.3	116.2
A4. Failure to reform the pension system	149.4	130.8	116.0	113.8	113.1	111.6	141.9	169.5
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2008-09	149.4	140.0	130.6	125.0	120.6	115.4	127.2	109.4
B2. Export value growth at historical average minus one standard deviation in 2008-09 3/	149.4	171.4	207.4	200.7	195.4	188.0	175.7	115.7
B3. US dollar GDP deflator at historical average minus one standard deviation in 2008-09	149.4	162.2	174.7	167.2	161.3	154.3	170.1	146.3
B4. Net non-debt creating flows at historical average minus one standard deviation in 2008-09 4/	149.4	220.7	275.3	267.2	260.8	251.5	221.7	129.7
B5. Combination of B1-B4 using one-half standard deviation shocks	149.4	266.5	412.1	400.2	390.8	376.9	330.2	189.6
B6. One-time 30 percent nominal depreciation relative to the baseline in 2008 5/	149.4	180.4	158.1	151.3	146.0	139.6	153.9	132.4

Table 2 (concluded). Kyrgyz Republic: Sensitivity Analyses for Key Indicators of Public and Publicly Guaranteed External Debt, 2007-27
(In percent)

	Projections							
	2007	2008	2009	2010	2011	2012	2017	2027
Debt service-to-exports ratio								
Baseline	3.5	3.5	3.5	3.4	3.3	3.1	4.2	5.8
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2008-27 1/	3.5	3.9	3.7	3.5	3.3	3.1	2.9	4.9
A2. New public sector loans on less favorable terms in 2008-27 2/	3.5	3.5	3.9	4.2	4.3	4.3	6.2	12.9
A3. Terms-of-trade shock (sharp decline in gold prices)	3.5	3.6	3.8	4.0	4.5	5.0	7.4	7.1
A4. Failure to reform the pension system	3.5	3.5	3.5	3.5	3.6	3.6	6.3	11.5
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2008-09	3.5	3.5	3.5	3.4	3.3	3.1	4.2	5.8
B2. Export value growth at historical average minus one standard deviation in 2008-09 3/	3.5	4.5	6.1	7.3	7.0	6.7	11.1	11.2
B3. US dollar GDP deflator at historical average minus one standard deviation in 2008-09	3.5	3.5	3.5	3.4	3.3	3.1	4.2	5.8
B4. Net non-debt creating flows at historical average minus one standard deviation in 2008-09 4/	3.5	3.5	4.9	6.2	5.9	5.7	10.1	9.0
B5. Combination of B1-B4 using one-half standard deviation shocks	3.5	4.1	6.1	8.0	7.7	7.4	13.1	11.5
B6. One-time 30 percent nominal depreciation relative to the baseline in 2008 5/	3.5	3.5	3.5	3.4	3.3	3.1	4.2	5.8
Debt service-to-revenue ratio 6/								
Baseline	7.8	8.0	7.5	7.3	7.1	6.5	8.0	11.1
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2008-27 1/	7.8	8.8	8.0	7.4	7.0	6.4	5.5	9.4
A2. New public sector loans on less favorable terms in 2008-27 2/	7.8	8.0	8.3	8.9	9.3	9.0	11.9	24.7
A3. Terms-of-trade shock (sharp decline in gold prices)	7.8	8.0	8.0	8.5	9.7	10.9	15.3	14.7
A4. Failure to reform the pension system	7.8	8.0	7.6	7.5	7.7	7.5	12.1	22.0
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2008-09	7.8	8.6	8.6	8.3	8.0	7.4	9.2	12.6
B2. Export value growth at historical average minus one standard deviation in 2008-09 3/	7.8	8.0	8.9	10.7	10.4	9.7	14.6	14.7
B3. US dollar GDP deflator at historical average minus one standard deviation in 2008-09	7.8	10.0	11.4	11.1	10.8	9.9	12.2	16.9
B4. Net non-debt creating flows at historical average minus one standard deviation in 2008-09 4/	7.8	8.0	10.5	13.2	12.8	12.0	19.4	17.3
B5. Combination of B1-B4 using one-half standard deviation shocks	7.8	9.7	15.1	19.6	19.0	17.9	29.1	25.5
B6. One-time 30 percent nominal depreciation relative to the baseline in 2008 5/	7.8	11.1	10.4	10.1	9.7	9.0	11.1	15.3
Memorandum item:								
Grant element assumed on residual financing (i.e., financing required above baseline) 7/	16.4	16.4	16.4	16.4	16.4	16.4	16.4	16.4

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 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 are the same 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/ State government revenues excluding grants.
7/ Applies to all stress scenarios except for A2 (less favorable financing) in which the terms on all new financing are as specified in footnote 2.

Table 3.Kyrgyz Republic: Public Sector Debt Sustainability Framework, Baseline Scenario, 2004-2027
(In percent of GDP, unless otherwise indicated)

	Actual					Estimate	Projections								
	2004	2005	2006	Historical Average 5/	Standard Deviation 5/	2007	2008	2009	2010	2011	2012	2007-12 Average	2017	2027	2013-27 Average
Public sector debt 1/	96.1	85.1	76.0			62.9	54.9	48.9	45.9	43.6	41.8		36.7	30.0	
o/w foreign-currency denominated	90.3	79.6	71.9			59.3	51.8	45.5	42.3	39.7	37.5		36.7	28.8	
Change in public sector debt	-10.8	-11.0	-9.1			-13.0	-8.0	-6.1	-3.0	-2.2	-1.9		-1.0	-0.5	
Identified debt-creating flows	-13.6	-5.8	-8.7			-12.4	-7.1	-5.5	-2.4	-1.7	-1.5		-1.0	-0.6	
Primary deficit	3.1	2.2	1.2	5.3	3.2	1.3	1.2	1.0	0.9	1.2	1.0	1.1	0.8	0.4	0.7
Revenue and grants	23.3	24.7	26.6			30.1	29.9	29.8	29.4	29.0	29.0		29.3	29.5	
of which : grants	1.0	1.0	0.8			2.1	2.0	1.8	1.9	1.9	1.8		1.7	1.6	
Primary (noninterest) expenditure	26.4	26.9	27.8			31.4	31.1	30.8	30.3	30.2	30.0		30.1	29.9	
Automatic debt dynamics	-12.7	-7.8	-9.9			-13.4	-8.1	-6.3	-3.2	-2.7	-2.3		-1.6	-1.0	
Contribution from interest rate/growth differential	-8.5	-1.3	-4.0			-6.3	-4.6	-3.6	-2.9	-2.5	-2.2		-1.5	-0.9	
of which : contribution from average real interest rate	-1.5	-1.4	-1.7			-1.0	-0.5	-0.3	-0.2	-0.1	-0.1		0.2	0.4	
of which : contribution from real GDP growth	-7.0	0.2	-2.2			-5.3	-4.1	-3.4	-2.8	-2.4	-2.1		-1.6	-1.2	
Contribution from real exchange rate depreciation	-4.1	-6.5	-6.0			-7.2	-3.5	-2.7	-0.2	-0.2	-0.2		...	...	
Other identified debt-creating flows	-4.0	-0.2	0.0			-0.3	-0.2	-0.2	-0.2	-0.1	-0.1		-0.1	-0.1	
Privatization receipts (negative)	-4.0	-0.2	0.0			-0.3	-0.2	-0.2	-0.2	-0.1	-0.1		-0.1	-0.1	
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	2.8	-5.3	-0.4			-0.7	-0.9	-0.6	-0.6	-0.5	-0.4		0.0	0.1	
NPV of public sector debt	67.6	54.0	50.3			41.8	36.7	33.1	31.3	30.2	29.3		27.3	24.6	
o/w foreign-currency denominated	61.8	48.5	46.2			38.1	33.6	29.7	27.8	26.3	25.1		27.3	23.4	
o/w external	59.6	46.5	44.5			36.6	32.2	28.5	26.7	25.3	24.2		26.7	23.1	
NPV of contingent liabilities (not included in public sector debt)	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Gross financing need 2/	8.5	8.1	5.1			5.0	4.0	4.1	4.3	4.7	4.6		2.8	4.0	
NPV of public sector debt-to-revenue and grants ratio (in percent)	343.5	259.3	221.9			157.4	137.7	123.9	119.4	117.4	113.8		106.3	95.6	
NPV of public sector debt-to-revenue ratio (in percent)	362.0	272.6	229.9			170.6	148.9	132.9	128.5	126.5	122.5		114.0	102.1	
o/w external 3/	319.4	235.1	203.6			149.4	130.8	114.5	109.6	105.8	101.2		111.5	95.9	
Debt service-to-revenue and grants ratio (in percent) 4/	22.8	22.1	10.8			9.4	7.2	8.7	8.8	9.3	8.3		7.2	10.9	
Debt service-to-revenue ratio (in percent) 4/	24.1	23.2	11.2			10.2	7.8	9.4	9.5	10.0	8.9		7.7	11.6	
Primary deficit that stabilizes the debt-to-GDP ratio	13.9	13.2	10.3			14.4	9.2	7.0	3.9	3.4	2.9		1.8	1.0	
Key macroeconomic and fiscal assumptions															
Real GDP growth (in percent)	7.0	-0.2	2.7	4.3	3.3	7.5	7.0	6.5	6.0	5.5	5.0	6.3	4.5	4.3	4.2
Average nominal interest rate on forex debt (in percent)	1.7	1.7	1.0	2.4	1.1	0.9	1.1	1.4	1.5	1.5	1.5	1.3	2.4	3.2	2.6
Average real interest rate on domestic currency debt (in percent)	-7.6	-4.2	-5.1	-10.7	8.9	1.5	-0.8	0.7	1.1	1.7	2.1	1.0	6.5	3.7	-61.2
Real exchange rate depreciation (in percent, + indicates depreciation)	-4.5	-7.3	-7.9	0.9	21.0	-10.9	...	...	...	...	...	...	...	...	...
Inflation rate (GDP deflator, in percent)	5.1	7.1	9.2	12.8	11.5	7.5	7.5	6.5	6.2	5.5	5.0	6.4	4.0	4.0	4.0
Growth of real primary spending (deflated by GDP deflator, in percent)	9.9	1.8	6.3	4.7	7.9	21.6	5.9	5.5	4.3	4.9	4.5	7.8	4.6	4.1	4.2
Grant element of new external borrowing (in percent)	...	...	0.0	0.0	…	52.2	52.5	45.3	45.3	41.6	39.8	46.1	21.7	12.1	...

Sources: Country authorities; and Fund staff estimates and projections.
1/ Covers general government debt in gross terms
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 4.Kyrgyz Republic: Sensitivity Analysis for Key Indicators of Public Debt 2007-2027

	Projections							
	2007	2008	2009	2010	2011	2012	2017	2027
NPV of Debt-to-GDP Ratio								
Baseline	42	37	33	31	30	29	27	25
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	42	41	41	43	46	48	60	82
A2. Primary balance is unchanged from 2007	42	37	33	32	31	30	30	32
A3. Permanently lower GDP growth 1/	42	37	34	33	33	33	38	59
A4. Terms-of-Trade Shock (sharp decline in gold prices)	42	37	35	36	38	40	43	37
A5. Failure to Reform the Pension System	42	37	34	33	32	32	35	42
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2008-2009	42	40	41	41	43	44	53	67
B2. Primary balance is at historical average minus one standard deviations in 2008-2009	42	43	45	42	41	40	37	31
B3. Combination of B1-B2 using one half standard deviation shocks	42	43	45	42	41	39	35	29
B4. One-time 30 percent real depreciation in 2008	42	51	46	43	41	40	36	33
B5. 10 percent of GDP increase in other debt-creating flows in 2008	42	45	41	39	37	36	33	29
NPV of Debt-to-Revenue Ratio 2/								
Baseline	157	138	124	119	117	114	106	96
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	157	154	155	166	178	187	236	322
A2. Primary balance is unchanged from 2007	157	138	125	122	120	118	118	123
A3. Permanently lower GDP growth 1/	157	139	127	126	127	127	147	233
A4. Terms-of-Trade Shock (sharp decline in gold prices)	157	138	132	138	146	152	164	132
A5. Failure to Reform the Pension System	157	138	126	124	125	125	137	161
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2008-2009	157	151	154	159	166	171	207	264
B2. Primary balance is at historical average minus one standard deviations in 2008-2009	157	161	168	162	159	154	142	121
B3. Combination of B1-B2 using one half standard deviation shocks	157	162	169	162	159	153	139	115
B4. One-time 30 percent real depreciation in 2008	157	191	171	164	161	155	142	127
B5. 10 percent of GDP increase in other debt-creating flows in 2008	157	169	152	147	144	140	129	112
Debt Service-to-Revenue Ratio 2/								
Baseline	9	7	9	9	9	8	7	11
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	9	7	12	13	14	14	17	31
A2. Primary balance is unchanged from 2007	9	7	9	9	10	9	8	13
A3. Permanently lower GDP growth 1/	9	7	9	9	10	9	10	22
A4. Terms-of-Trade Shock (sharp decline in gold prices)	9	7	9	8	9	7	17	16
A5. Failure to Reform the Pension System	9	7	9	9	10	10	11	21
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2008-2009	9	8	11	12	13	13	14	26
B2. Primary balance is at historical average minus one standard deviations in 2008-2009	9	7	13	15	12	10	11	14
B3. Combination of B1-B2 using one half standard deviation shocks	9	8	13	14	12	10	10	13
B4. One-time 30 percent real depreciation in 2008	9	8	10	10	10	9	9	14
B5. 10 percent of GDP increase in other debt-creating flows in 2008	9	7	15	11	11	9	9	13

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