INTERNATIONAL DEVELOPMENT ASSOCIATION
AND
INTERNATIONAL MONETARY FUND

RWANDA

Joint IMF/World Bank Debt Sustainability Analysis

Prepared by the Staffs of the International Monetary Fund and the International Development Association

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This debt sustainability analysis (DSA) assesses the sustainability of Rwanda's external and domestic public debt. It was conducted jointly by the staffs of the IMF and the World Bank using the Bank-Fund framework for debt sustainability analysis for low-income countries. The analysis concludes that Rwanda is at a moderate risk of debt distress.

VI. BACKGROUND

21. **Rwanda's debt distress classification has been revised from high to moderate.** The last joint DSA, undertaken in February 2008, concluded that Rwanda was at high risk of debt distress, as the PV of debt to exports ratio breached its policy dependent threshold under the baseline scenario. Given Rwanda's small export base and vulnerability to shocks, the last DSA concluded that continued high level of grants was needed to maintain the PV of external debt-to-exports ratio at sustainable levels. In the current update of the DSA, Rwanda's PV of debt to GDP ratio in 2007 is higher than that projected in the previous DSA.[1] At the same time, the long-term outlook has somewhat improved: (i) grants committed for 2009-11 are now higher, taking into account the new multiyear commitments by donor countries, (ii) exports are higher mainly due to a better outturn in 2007 and higher projections for 2008, and (iii) the projected fiscal financing gap is lower, due to higher budget revenues (reflecting better-than expected collection in 2008 and the authorities' efforts to widen the revenue base) and lower current expenditure path (due to the government's plans to reduce exceptional expenditures related to the demobilization and reintegration of former rebels). Consequently, the current DSA projects the PV of debt to exports ratio and other external

[1] The projections of future debt service and the outstanding stock of debt in U.S. dollar terms have been revised upward to reflect actual borrowings in 2007 and the depreciation of U.S. dollar against other major currencies.

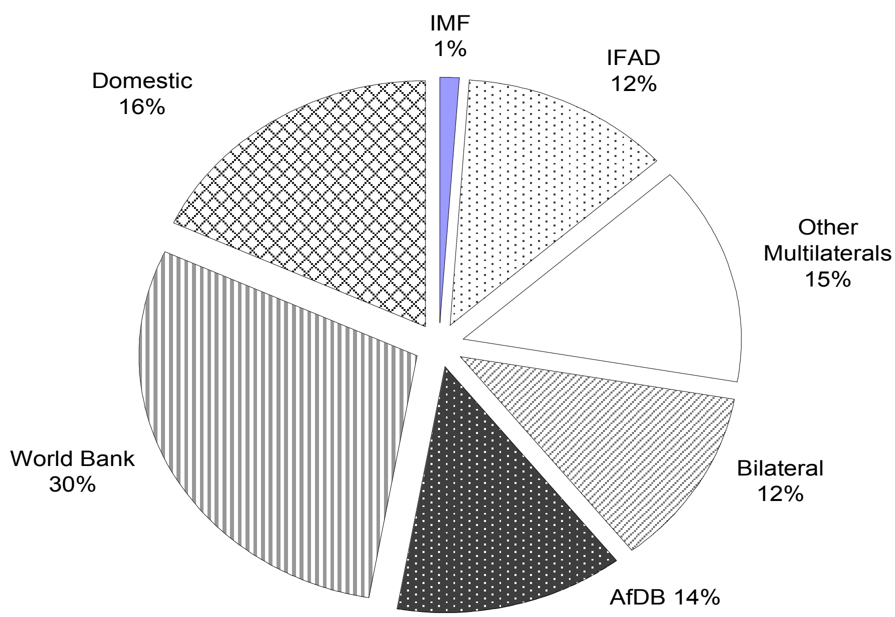
debt indicators to stay below the relevant policy-based indicative thresholds throughout the entire projection period.

22. **Rwanda reached the HIPC completion point in April 2005 and qualified for the Multilateral Debt Relief Initiative (MDRI) in January 2006, which substantially improved its debt indicators.**[2] By end-2006, Rwanda's public debt had declined to 29 percent of GDP from 84 percent in the previous year. In 2007, the pace of debt accumulation slightly exceeded the nominal GDP growth, and the ratio of public sector debt to GDP marginally increased. External debt outstanding amounted to nearly 17 percent of GDP at end-2007, broadly unchanged from end-2006.

23. **At end-2007, Rwanda's liabilities to international multilateral institutions comprised the largest share of its debt.** In terms of the creditor composition, about 72 percent of the public debt at end-2007 was owed to multilaterals, while 12 percent was owed to official bilateral creditors. Domestic debt comprised the remaining 16 percent of the public debt (Figure 1).

Figure 1. Public Sector Debt at end-2007

(Shares in U.S. dollars)



[2] The implementation of debt relief under the enhanced HIPC initiative is at an advanced stage. In addition to the IMF, IDA, and AfDB, completion point and topping up assistance have been provided by BADEA and the OPEC Fund. IFAD, the Kuwait Fund, the Saudi Fund and the EU have already provided completion point assistance. Bilateral agreements have been signed with all Paris Club creditors, except France. China has canceled all outstanding loans, while debts owed to the Abu Dhabi Fund, France, Libya, Saudi Arabia and Kuwait are under negotiation.

VII. MACROECONOMIC FRAMEWORK

24. **The macroeconomic framework is more favorable over the long term than the one presented in the last DSA** (Box 1). The new baseline reflects:

a. Higher level of nominal and real GDP due to an upward revision in the real GDP growth for 2006-07 and projections for 2008 (from 6.0 to 8.5 percent). The projected growth rate over the medium term takes into account the likely impact of the global crisis (Box 1). Inflation projections for 2008 and 2009 are also higher than envisaged in the previous DSA, but from 2010 inflation reverts to the long-term trend after the impact of international fuel and food prices has passed through and corrective domestic policies are implemented. The exchange rate is projected to depreciate somewhat faster in 2008-09 during the period of high inflation and remain unchanged in real terms from 2010 onward.

b. Higher export receipts, reflecting the actual outturn for 2007 and the higher projection for 2008 due to higher commodity prices and export volumes of coffee, tea, and minerals as well as an increase in tourism arrivals. Consequently, projections of export receipts over the medium to long term are somewhat higher. Nevertheless, these results take into account the likely impact of the global slowdown (Box 1).

c. Lower borrowing requirements because

   i. revenue collections are higher than projected for 2008, and the authorities have stepped up efforts to widen the revenue base and boost efficiency of tax collection over the medium-term. The revenue-to-GDP ratio is projected to average 16.7 percent over the long term (Table 3a), as compared with 15.7 percent in the last DSA;

   ii. total expenditures are projected to be lower than in the last DSA, largely reflecting the expected cuts in non-priority and exceptional expenditures projected from 2009 (Text Table 1). The total public expenditure is projected to average 25.5 percent of GDP, as compared with 26.1 percent of GDP in the last DSA;

   iii. a new and higher multi-year commitment of grants from major donors satisfies most of Rwanda's financing needs in the short-term (Text Table 1).[3] Reflecting available information, the proportion of loans in external financing gradually increases from about 12 percent and 9 percent

[3] As agreed in the Memorandum of Understanding Governing the Provision of Direct Budget Support in the Implementation of Rwanda's Economic Development and Poverty Reduction Strategy signed by the government and major donors in September 2008.

in 2008 and 2009 respectively, to an average of about 26 percent in 2010-11 and annual average of about 33 percent from 2012 onward. In 2008 and 2009 the budget support from IDA is in the form of grants and is assumed as loans from 2010 onward.[4] Financing for the Nyabarongo project, which is on non-concessional terms, is considered as part of the baseline rather than as an alternative scenario. All other government borrowing is assumed to be financed with loans at an average concessionality of 61 percent reflecting the government's plans to largely rely on borrowing from IDA and AfDB, in line with recent trends.

Text Table 1. Rwanda: Medium-Term Framework, 2005–13

	2005	2006	2007	2008	2009	2010	2011	2012	2013
				Projection					
Economic growth and inflation (percentage change)									
Real GDP (percentage change)	7.2	7.3	7.9	8.5	6.0	6.0	6.0	6.0	6.0
Real GDP (per capita)	5.4	5.4	5.7	6.2	3.8	3.8	3.8	3.8	3.8
Consumer price index (eop)	5.6	12.2	6.6	22.0	6.0	5.0	5.0	5.0	5.0
Central government budget (percent of GDP)									
Revenue	13.5	13.3	13.6	14.2	14.4	14.6	14.7	14.8	15.0
Grants	12.6	10.7	9.9	13.0	13.6	9.4	8.1	7.5	7.4
Government expenditure and net lending	25.6	24.5	24.9	27.1	27.0	26.4	25.9	25.6	25.8
Current expenditure	16.1	16.3	16.8	15.8	15.9	15.6	15.5	16.2	16.6
Capital expenditure	9.1	7.6	8.6	10.9	10.9	10.5	10.1	9.1	9.0
Domestic fiscal balance (excl. demobilization spending)	-5.1	-5.4	-6.1	-6.5	-6.8	-6.6	-6.8	-5.1	-5.1
Overall balance (payment order)									
After grants	0.6	-0.4	-1.5	0.1	0.9	-2.5	-3.0	0.9	-2.5
Before grants	-12.0	-11.1	-11.3	-13.0	-12.6	-11.9	-11.2	-12.6	-11.9
National accounts (percent of GDP)									
Gross domestic investment	21.6	20.4	21.0	23.4	23.5	23.1	22.9	22.0	22.0
Of which : private	12.5	12.8	12.4	12.5	12.6	12.7	12.8	12.9	13.0
Gross national savings	6.0	4.3	5.4	5.0	5.1	6.1	6.6	5.7	6.0
Current account bal. (excl. grants)	-15.6	-16.1	-15.5	-18.4	-18.4	-17.0	-16.3	-16.3	-16.0
Balance of payments (percent of GDP)									
Exports of goods and services	10.2	9.7	9.7	9.0	8.7	9.3	9.5	9.6	9.5
Imports of goods and services	26.7	27.5	27.7	30.1	29.3	28.6	28.7	28.9	28.5
Current account balance (incl. grants)	-1.1	-7.4	-4.9	-7.1	-8.2	-9.4	-9.5	-10.6	-10.3
Overall balance	4.6	2.9	3.2	0.9	-0.5	0.9	0.9	0.7	0.8
Gross official reservess (months of imports of G&S)	6.2	5.6	5.2	5.1	4.6	4.6	4.6	4.6	4.6
Nominal GDP (billions of Rwandan francs)	1332.9	1563.8	1866.1	2333.1	2737.6	3049.5	3394.9	3775.6	4199.2

Sources : Rwandan authorities; and staff estimates and projections.

[4] This assumption for IDA financing avoids the endogeneity problem in IDA's decision to allocate grants.

Box 1. Macroeconomic Assumptions

Rwanda's real GDP growth is projected to stabilize at about 6 percent for the projection period. This growth rate is 1¾ percentage points lower than the historical trend over the past 4 years (Text Table 1) and assumes that the global slowdown results in lower remittances and slower growth in the construction and tourism sectors and other services. At the same time, subsistence agriculture comprises a large share of the Rwandan economy, which is not strongly integrated into the world economy. In light of the Government's plans to adopt measures to improve agriculture productivity (through improving water management, controlling soil erosion, intensifying the use of fertilizer and seed inputs, integrating livestock development into crop farming, and enhancing extension services), growth in the agriculture sector is projected to be strong over the medium term and is expected to be the driving force of the overall economic growth. Over the long term, measures to facilitate trade and reduce transaction costs as well as investments in infrastructure and human capital are expected to sustain growth in the services and manufacturing sectors. Rwanda is also consulting with donors on an energy sector strategy to systematically address its energy constraints in a sustainable manner. In addition, government is elaborating a strategy to develop vocational education and training, and ensure that the education system is producing the types of graduates that are most needed for employment and growth.

Exports of goods and services are projected to grow at an average rate of about 10 percent in U.S. dollar terms—less than half of the average annual export growth over the past 5 years (23 percent). While the export prices are projected to decline from the high levels of 2008, the growth of export volumes is expected to remain robust, as the government's export promotion strategy takes effect. Export growth in the future is expected to be affected by interventions aimed at increasing yield and value added in the coffee and tea industry through increased utilization of fertilizers, improved harvesting methods and better seed quality. With support from both the EU and the World Bank, investments in road construction should help reduce the costs of transport, as should regional projects through the Nile Basin Initiative and a regional Bank project on transport. Services exports are likely to remain buoyant on account of improved marketing efforts and increased hotel room capacity.

Imports of goods and services are projected to grow by 9 percent on average over the period 2008-28, mostly due to growing demand for capital good imports in the medium term from the private sector, which is partly offset by substantially lower transportation costs because of better infrastructure links both internally and with neighboring countries.

VIII. External Debt Sustainability Analysis

A. Baseline

25. **The external DSA indicates that all Rwanda's debt indicators are below the policy-dependent indicative thresholds.**[5] Rwanda's PV of debt-to-exports ratio is projected to peak at 138 percent in 2021 and decline thereafter (Figure 2). This improvement over the previous DSA results (where the ratio breached the policy dependent threshold in 2018) mainly reflects the improved long-term macroeconomic framework. At the same time, the PV of external debt-to-GDP and the PV of debt-to-revenue ratios remain well below their thresholds throughout the forecast period, while debt service payments continue to be manageable at below 10 percent of exports.

B. Stress Tests

26. **Rwanda's debt dynamics would deteriorate sharply if external financing were delivered on less favorable terms.** A 2 percentage point increase in interest rates on all new borrowing (reflecting borrowing at less concessional terms) starting in 2008 would substantially increase Rwanda's PV of debt-to-exports ratio, which would breach the threshold by 2018 and remain above the threshold until 2025 (Table 3b).[6] This indicates that Rwanda should rely to a large extent on grants to finance its development efforts.

27. **Shocks to the small export base would substantially worsen Rwanda's PV of debt-to-exports ratio.** If exports were to grow at the historical average less one standard deviation in 2009 and 2010 (equivalent to a 20 percent reduction in exports in 2009 relative to the baseline), Rwanda's PV of debt-to-exports ratio would exceed 150 percent from 2010 onward, peaking at over 230 percent in 2019 (Figure 2). This scenario highlights the importance of effective export promotion to set Rwanda on a sustainable debt path.

28. **In the historical scenario, the indicators of debt sustainability remain below the policy-based thresholds.** The improvement in the historical scenario as compared to the last DSA largely resulted from changing projections for the private capital flows. The better than expected outcome of 2007 and improved projections for 2008 led to a shift of the path for foreign direct investment and private debt-creating flows over the long term.

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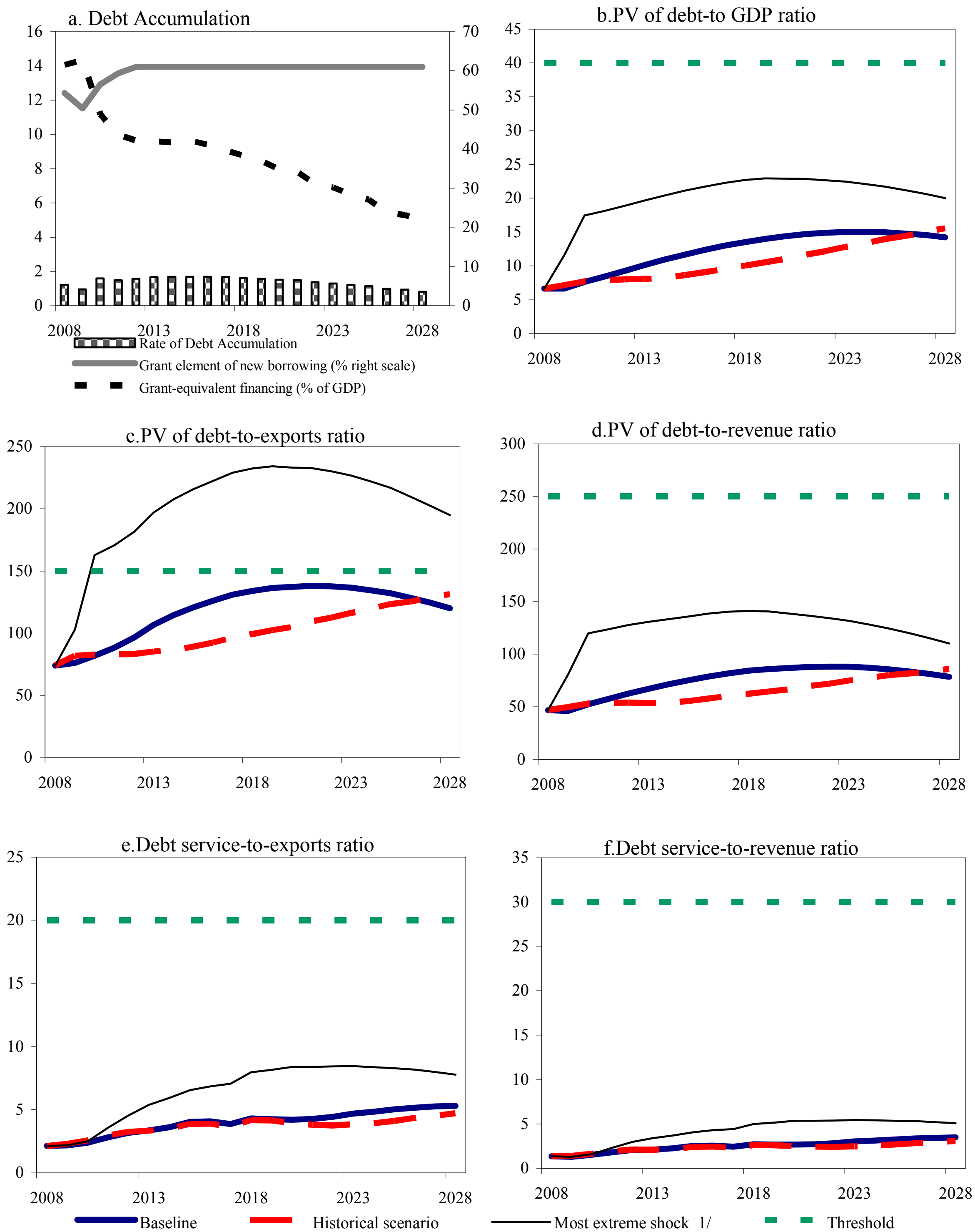
[5] The World Bank's three-year average CPIA classifies Rwanda as a medium policy performer.

[6] The 2 percent increase in interest rates would be equivalent to lowering the grant element to fewer than 35 percent from 2009 onward (which is below the grant element of 50 percent required under the Rwanda's PRGF).

Figure 2. Rwanda: Public and Publicly Guaranteed External Debt, 2008-28



Source: Staff projections and simulations.

1/ The most extreme stress test is the test that yields the highest ratio in 2018. In Figure b. it corresponds to a Combination shock; in Figure c. to a Exports shock; in Figure d. to a Combination shock; in Figure e. to a Terms shock and in Figure f to a Terms shock

IX. Public Debt Sustainability Analysis

A. Baseline

29. **Rwanda's public debt burden (including domestic debt) is expected to stabilize over the projection period.**[7] With moderate domestic financing over the long term, the PV of domestic debt is expected to stabilize at about 5 percent of GDP from 2018 onward. This trend is partly offsetting the increase in external debt, so that the PV of total public debt-to-GDP ratio would increase from 15 percent in 2008 and stabilize at about 20 percent in the long term. The debt service-to-revenue ratio would remain below 4 percent (Figure 3).

B. Stress Tests

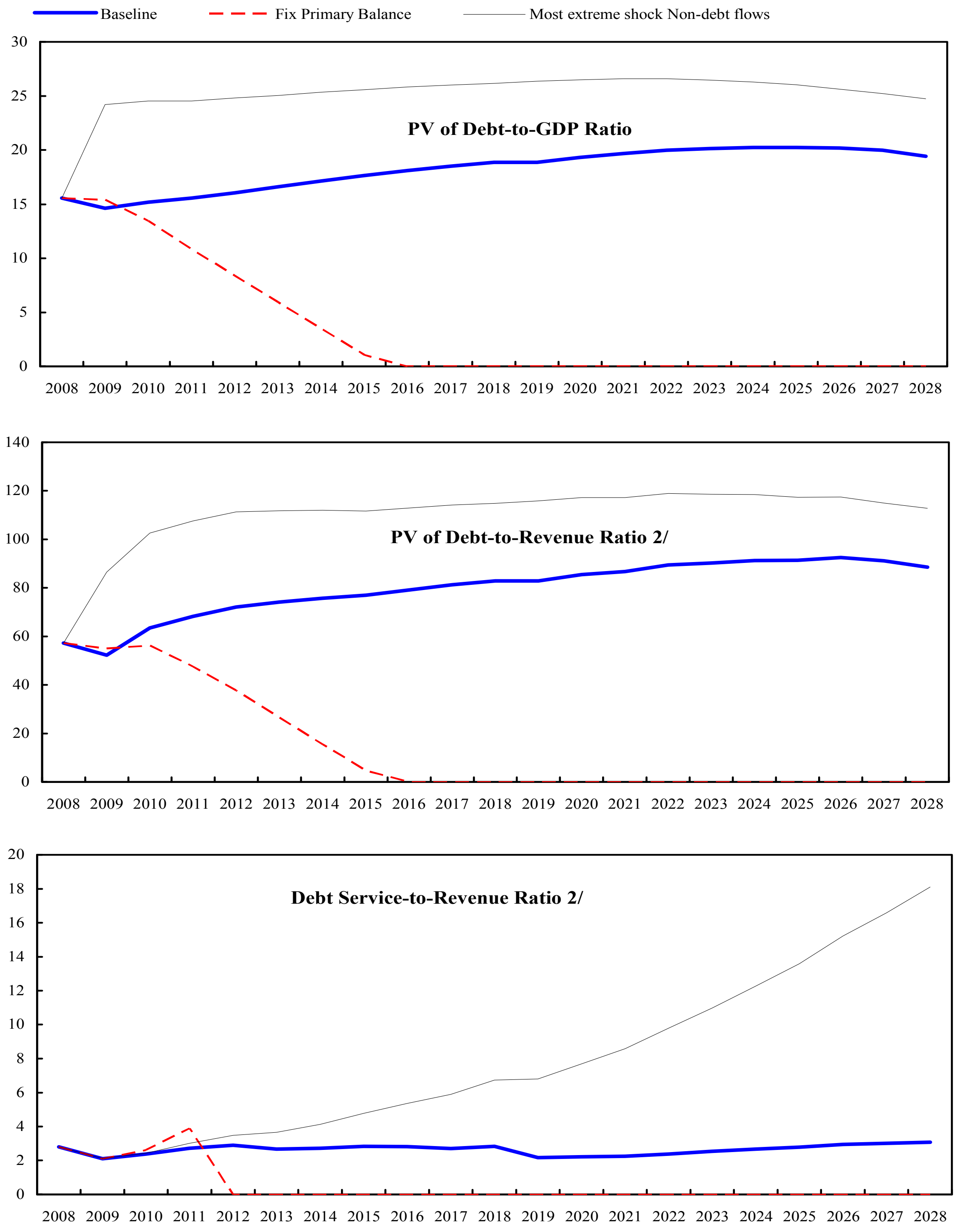
30. **Lower GDP growth would result in much less favorable debt dynamics.** Both growth-related stress tests (assuming growth at the historical average less one standard deviation in 2009-10 and permanently lower growth during 2009-28) imply a substantial worsening in all debt indicators (though all indicators stay below debt burden thresholds). This underscores the importance of selecting and investing only in infrastructure projects with a high rate of return and undertaking structural reforms to set the stage for robust private sector growth.

31. **Debt indicators would worsen under the bounds test, where there is a 10 percent of GDP increase in debt-creating flows in 2009.** The PV of debt-to-GDP ratio would climb to 38 percent by 2028. The PV of debt-to-revenue ratio and debt service-to-revenue ratio would accelerate reaching 104 percent and 27 percent, respectively, in 2011. This scenario demonstrates the impact of contingent liabilities, such as the recapitalization of banks or systematically important private or public sector entities, and highlights the need for appropriately accounting for fiscal risks and maintaining contingency reserve funds for addressing the shocks.

32. **However, the scenario with fixed primary deficit suggests that reining in government spending can significantly improve the debt dynamics.** In this scenario, the primary balance for 2009-28 is assumed to be in a small surplus as projected for 2008 (while the baseline scenario projects a modest primary deficit). This together with the high level of grants received by Rwanda in the baseline scenario implies that the financing need in the scenario is exclusively covered by grants. Over time, this would cause the public debt to decrease.

[7] The DSA excludes contingent liabilities of the pension fund and possible government guarantees for the public power utility Electrogaz, which are not yet quantifiable because projects in the sector are still at an early stage.

Figure 3. Rwanda: Indicators of Public Debt Under Alternative Scenarios, 2008-28



Sources: Country authorities; and Fund staff estimates and projections.
1/ The most extreme stress test is the test that yields the highest ratio in 2018.
2/ Revenues are defined inclusive of grants.

X. Conclusion

33. **The baseline, alternative scenarios and stress tests confirm that Rwanda faces a moderate risk of debt distress.** Despite reduced risk of debt distress, owing to recent debt relief and favorable debt developments in the last year, exogenous shocks to exports or imprudent borrowing on nonconcessional terms could cause a rapid deterioration in the medium-term outlook. The alternative scenarios and stress tests indicate that debt indicators are highly sensitive to less concessional financing and lower growth, particularly in exports. This indicates that Rwanda should rely on concessional borrowing and grants to finance its development efforts.

34. **The DSA suggests that investment and structural reforms should focus on enhancing private-sector led exports and growth and protecting Rwanda against shocks.** Reducing the cost of doing business, financial sector reform and infrastructure investments will be critical. These efforts, together with measures to promote exports, should not only raise overall growth, but also help improve the business and investment climate, and facilitate a strengthening and diversification of the export base. At the same time, the authorities are committed to reforms to improve expenditure and debt management and raise the revenue-to-GDP ratio for an eventual exit from donor flows.

Table 1a.Rwanda: Public Sector Debt Sustainability Framework, Baseline Scenario, 2005-2028
(In percent of GDP, unless otherwise indicated)

	Actual			Average	Standard Deviation	Estimate	Projections								
	2005	2006	2007			2008	2009	2010	2011	2012	2013	2008-13 Average	2018	2028	2014-28 Average
Public sector debt 1/	83.7	28.9	29.4			24.4	22.9	24.5	25.8	27.4	29.1		35.2	34.6	
o/w foreign-currency denominated	70.1	16.8	16.7			15.5	15.1	17.1	18.8	20.8	22.8		30.0	29.6	
Change in public sector debt	-0.1	-54.8	0.5			-5.0	-1.4	1.6	1.3	1.6	1.7		0.8	-0.8	
Identified debt-creating flows	-16.1	-53.9	-3.4			-5.6	-4.0	0.7	1.1	1.1	1.1		0.6	-1.0	
Primary deficit	-1.1	-0.3	0.9	0.8	1.6	-0.2	-1.0	2.4	2.9	3.0	3.1	1.7	3.0	1.5	2.5
Revenue and grants	26.2	24.0	23.4			27.2	28.0	23.9	22.8	22.3	22.4		22.8	21.9	
of which: grants	12.6	10.7	9.9			13.0	13.6	9.4	8.1	7.5	7.4		6.7	3.8	
Primary (noninterest) expenditure	25.0	23.7	24.3			26.9	26.9	26.3	25.7	25.2	25.6		25.8	23.5	
Automatic debt dynamics	-13.7	-12.2	-4.2			-5.2	-2.8	-1.6	-1.7	-1.8	-1.9		-2.4	-2.5	
Contribution from interest rate/growth differential	-7.8	-8.0	-2.9			-3.6	-2.1	-1.5	-1.7	-1.8	-1.9		-2.4	-2.5	
of which: contribution from average real interest rate	-2.2	-2.3	-0.8			-1.3	-0.7	-0.3	-0.3	-0.3	-0.4		-0.5	-0.5	
of which: contribution from real GDP growth	-5.6	-5.7	-2.1			-2.3	-1.4	-1.3	-1.4	-1.5	-1.6		-1.9	-2.0	
Contribution from real exchange rate depreciation	-5.8	-4.1	-1.2			-1.5	-0.7	0.0	0.0	0.0	0.0		...	...	
Other identified debt-creating flows	-1.3	-41.4	-0.1			-0.2	-0.1	-0.1	-0.1	-0.1	-0.1		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)	-1.3	-41.4	-0.1			-0.2	-0.1	-0.1	-0.1	-0.1	-0.1		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	16.0	-0.9	4.0			0.5	2.6	0.9	0.2	0.5	0.5		0.3	0.2	
Other Sustainability Indicators															
PV of public sector debt	...	...	19.7			15.6	14.6	15.2	15.6	16.1	16.6		18.9	19.4	
o/w foreign-currency denominated	...	...	7.0			6.7	6.7	7.7	8.5	9.4	10.3		13.7	14.4	
o/w external	...	...	7.0			6.7	6.7	7.7	8.5	9.4	10.3		13.7	14.4	
PV of contingent liabilities (not included in public sector debt)	...	...	...			...	...	...	...	...	...		...	...	
Gross financing need 2/	-0.2	0.6	1.6			0.5	0.1	3.4	4.0	4.1	4.2		4.1	2.6	
PV of public sector debt-to-revenue and grants ratio (in percent)	…	…	84.0			57.2	52.3	63.5	68.3	72.1	74.1		82.9	88.6	
PV of public sector debt-to-revenue ratio (in percent)	…	…	145.1			109.9	101.6	104.3	106.1	108.5	110.5		117.5	107.3	
o/w external 3/	…	…	51.8			47.4	46.8	53.1	58.2	63.5	68.3		85.4	79.8	
Debt service-to-revenue and grants ratio (in percent) 4/	3.5	3.8	3.3			2.8	2.1	2.4	2.7	2.9	2.7		2.8	3.1	
Debt service-to-revenue ratio (in percent) 4/	6.8	6.8	5.6			5.4	4.1	3.9	4.2	4.4	4.0		4.0	3.7	
Primary deficit that stabilizes the debt-to-GDP ratio	-1.0	54.4	0.3			4.8	0.4	0.8	1.6	1.4	1.5		2.1	2.3	
Key macroeconomic and fiscal assumptions															
Real GDP growth (in percent)	7.2	7.3	7.9	7.0	2.8	8.5	6.0	6.0	6.0	6.0	6.0	6.4	6.0	6.0	6.0
Average nominal interest rate on forex debt (in percent)	0.3	0.3	1.2	0.6	0.4	1.0	0.9	1.1	0.8	0.8	0.8	0.9	0.8	0.7	0.8
Average real interest rate on domestic debt (in percent)	...	-4.2	-5.4	-4.8	0.8	-10.4	-6.7	-1.8	-1.9	-2.0	-2.4	-4.2	-3.5	-3.7	-3.5
Real exchange rate depreciation (in percent, + indicates depreciation)	-7.7	-6.5	-8.0	1.4	13.3	-10.1	...	...	...	...	...	...	...	...	...
Inflation rate (GDP deflator, in percent)	9.2	9.4	10.5	6.0	8.4	15.3	10.7	5.1	5.0	4.9	4.9	7.7	4.9	4.9	4.9
Growth of real primary spending (deflated by GDP deflator, in percent)	0.1	0.0	0.1	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
Grant element of new external borrowing (in percent)	...	...	...	…	…	54.3	50.3	56.5	59.4	61.0	61.0	57.1	61.0	61.0	61.0

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

1/ [Indicate coverage of public sector, e.g., general government or nonfinancial public sector. Also whether net or gross debt is used.]

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

3/ Revenues excluding grants.

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

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

Table 2a.Rwanda: Sensitivity Analysis for Key Indicators of Public Debt 2008-2028

	Projections							
	2008	2009	2010	2011	2012	2013	2018	2028
PV of Debt-to-GDP Ratio								
Baseline	16	15	15	16	16	17	19	19
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	16	16	15	14	12	10	4	-1
A2. Primary balance is unchanged from 2008	16	15	13	11	8	6	-6	-18
A3. Permanently lower GDP growth 1/	16	15	16	16	17	18	25	40
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2009-2010	16	15	16	17	18	19	24	29
B2. Primary balance is at historical average minus one standard deviations in 2009-2010	16	18	19	19	19	20	22	21
B3. Combination of B1-B2 using one half standard deviation shocks	16	17	17	18	18	19	21	23
B4. One-time 30 percent real depreciation in 2009	16	17	17	16	16	16	16	18
B5. 10 percent of GDP increase in other debt-creating flows in 2009	16	24	25	25	25	25	26	25
PV of Debt-to-Revenue Ratio 2/								
Baseline	57	52	63	68	72	74	83	89
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	57	59	64	60	55	47	16	-5
A2. Primary balance is unchanged from 2008	57	55	56	47	38	27	-24	-84
A3. Permanently lower GDP growth 1/	57	53	65	71	77	81	106	177
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2009-2010	57	54	68	75	81	85	104	129
B2. Primary balance is at historical average minus one standard deviations in 2009-2010	57	64	78	83	86	88	95	97
B3. Combination of B1-B2 using one half standard deviation shocks	57	62	72	77	81	84	94	103
B4. One-time 30 percent real depreciation in 2009	57	61	70	72	73	72	72	83
B5. 10 percent of GDP increase in other debt-creating flows in 2009	57	86	103	108	111	112	115	113
Debt Service-to-Revenue Ratio 2/								
Baseline	2.8	2.1	2.4	2.7	2.9	2.7	2.8	3.1
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	2.8	2.1	2.9	6.8	-0.7	-0.8	-10.5	-11.3
A2. Primary balance is unchanged from 2008	2.8	2.1	2.6	3.9	-4.2	-5.9	-19.2	-27.4
A3. Permanently lower GDP growth 1/	2.8	2.1	2.4	3.0	3.5	3.7	6.7	18.1
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2009-2010	2.8	2.1	2.5	3.6	4.5	4.8	6.7	10.1
B2. Primary balance is at historical average minus one standard deviations in 2009-2010	2.8	2.1	3.4	11.3	4.6	7.8	4.1	4.9
B3. Combination of B1-B2 using one half standard deviation shocks	2.8	2.1	3.2	9.1	2.3	6.6	4.1	5.7
B4. One-time 30 percent real depreciation in 2009	2.8	2.3	2.8	3.4	3.8	3.7	4.8	6.8
B5. 10 percent of GDP increase in other debt-creating flows in 2009	2.8	2.1	5.3	26.9	6.9	16.9	6.2	8.1

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 length of the projection period.

2/ Revenues are defined inclusive of grants.

Table 3a.: External Debt Sustainability Framework, Baseline Scenario, 2005-2028 1/
(In percent of GDP, unless otherwise indicated)

	Actual			Historical Average 6/	Standard Deviation 6/	Projections									
	2005	2006	2007			2008	2009	2010	2011	2012	2013	2008-2013 Average	2018	2028	2014-2028 Average
External debt (nominal) 1/	**70.1**	**16.8**	**16.7**			**15.5**	**15.0**	**16.9**	**18.6**	**20.5**	**22.4**		**29.3**	**28.8**	29.3
o/w public and publicly guaranteed (PPG)	70.1	16.8	16.7			15.5	15.0	16.9	18.6	20.5	22.4		29.3	28.8	
Change in external debt	-13.7	-53.3	0.0			-1.3	-0.5	1.9	1.6	1.9	1.9		1.0	-0.8	
Identified net debt-creating flows	-18.2	-10.6	-3.0			-1.0	1.8	3.0	3.3	3.6	3.6		1.7	-0.3	
Non-interest current account deficit	**0.9**	**7.2**	**4.8**	**6.2**	**3.7**	**7.0**	**8.1**	**9.2**	**9.4**	**10.5**	**10.2**		**8.7**	**5.8**	7.9
Deficit in balance of goods and services	16.4	17.8	17.9			20.8	20.6	19.3	19.2	19.2	19.0		17.0	12.0	
Exports	10.2	9.7	9.7			9.0	8.7	9.3	9.5	9.6	9.5	9.3	10.1	11.8	
Imports	26.7	27.5	27.7			29.8	29.3	28.6	28.7	28.9	28.5		27.1	23.9	
Net current transfers (negative = inflow)	-16.5	-11.4	-13.5	-11.7	3.0	-14.2	-12.9	-10.3	-9.9	-8.9	-8.8		-8.2	-5.9	-7.4
o/w official	-14.5	-8.7	-10.6			-10.9	-10.2	-7.6	-6.8	-5.7	-5.7		-4.9	-2.1	
Other current account flows (negative = net inflow)	0.9	0.8	0.3			0.4	0.5	0.2	0.1	0.1	0.0		-0.1	-0.3	
Net FDI (negative = inflow)	**-4.7**	**-7.2**	**-5.1**	**-3.9**	**1.7**	**-7.0**	**-5.7**	**-5.5**	**-5.2**	**-6.0**	**-5.6**		**-5.6**	**-4.7**	-5.3
Endogenous debt dynamics 2/	**-14.3**	**-10.6**	**-2.7**			**-1.0**	**-0.7**	**-0.7**	**-0.8**	**-0.9**	**-1.0**		**-1.4**	**-1.4**	
Contribution from nominal interest rate	0.2	0.2	0.2			0.1	0.1	0.1	0.1	0.1	0.1		0.2	0.2	
Contribution from real GDP growth	-5.0	-4.3	-1.1			-1.1	-0.8	-0.8	-0.9	-1.0	-1.1		-1.6	-1.6	
Contribution from price and exchange rate changes	-9.6	-6.4	-1.7			…	…	…	…	…	…		…	…	
Residual (3-4) 3/	**4.5**	**-42.8**	**3.0**			**-0.3**	**-2.3**	**-1.1**	**-1.7**	**-1.7**	**-1.7**		**-0.8**	**-0.5**	
o/w 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/	...	...	7.1			6.6	6.6	7.6	8.3	9.1	10.0		13.2	13.8	
In percent of exports	...	...	72.5			73.9	75.8	81.3	87.5	95.0	105.2		131.0	116.9	
PV of PPG external debt	**...**	**...**	**7.1**			**6.6**	**6.6**	**7.6**	**8.3**	**9.1**	**10.0**		**13.2**	**13.8**	
In percent of exports	**...**	**...**	**72.5**			**73.9**	**75.8**	**81.3**	**87.5**	**95.0**	**105.2**		**131.0**	**116.9**	
In percent of government revenues	**...**	**...**	**52.1**			**46.8**	**46.0**	**51.9**	**56.7**	**61.7**	**66.2**		**82.2**	**76.4**	
Debt service-to-exports ratio (in percent)	**5.9**	**3.7**	**3.0**			**2.1**	**2.2**	**2.4**	**2.8**	**3.2**	**3.3**		**4.3**	**5.2**	
PPG debt service-to-exports ratio (in percent)	**5.9**	**3.7**	**3.0**			**2.1**	**2.2**	**2.4**	**2.8**	**3.2**	**3.3**		**4.3**	**5.2**	
PPG debt service-to-revenue ratio (in percent)	**4.5**	**2.7**	**2.2**			**1.3**	**1.3**	**1.5**	**1.8**	**2.0**	**2.1**		**2.7**	**3.4**	
Total gross financing need (Billions of U.S. dollars)	-0.1	0.0	0.0			0.0	0.1	0.2	0.3	0.3	0.3		0.3	0.4	
Non-interest current account deficit that stabilizes debt ratio	14.6	60.5	4.8			8.3	8.6	7.3	7.7	8.6	8.3		7.7	6.6	
Key macroeconomic assumptions															
Real GDP growth (in percent)	7.2	7.3	7.9	7.0	2.8	8.5	6.0	6.0	6.0	6.0	6.0	6.4	6.0	6.0	6.0
GDP deflator in US dollar terms (change in percent)	12.9	10.1	11.6	0.2	10.6	14.7	8.0	2.0	2.0	1.9	1.9	5.1	1.9	1.8	1.9
Effective interest rate (percent) 5/	0.3	0.3	1.2	0.6	0.4	1.0	0.9	1.1	0.8	0.8	0.8	0.9	0.8	0.7	0.8
Growth of exports of G&S (US dollar terms, in percent)	22.5	11.9	20.9	10.3	19.4	14.8	11.2	15.3	10.6	9.0	6.3	11.2	9.8	9.5	9.6
Growth of imports of G&S (US dollar terms, in percent)	24.1	22.0	21.0	7.6	11.2	33.8	12.6	5.7	8.5	8.5	6.5	12.6	6.8	6.8	9.7
Grant element of new public sector borrowing (in percent)	...	...	...	...	...	54.2	50.0	56.4	59.3	61.0	61.0	57.0	61.0	61.0	61.0
Government revenues (excluding grants, in percent of GDP)	13.5	13.3	13.6			14.2	14.4	14.6	14.7	14.8	15.0		16.1	18.1	16.7
Aid flows (in Billions of US dollars) 7/	0.4	0.4	0.4			0.6	0.7	0.7	0.6	0.7	0.7		1.0	1.2	
o/w Grants	0.3	0.3	0.3			0.6	0.7	0.5	0.5	0.5	0.5		0.7	0.8	
o/w Concessional loans	0.1	0.1	0.1			0.1	0.1	0.2	0.2	0.2	0.2		0.3	0.4	
Grant-equivalent financing (in percent of GDP) 8/	...	...	...			14.0	14.3	11.1	9.9	9.6	9.5		8.7	4.9	7.5
Grant-equivalent financing (in percent of external financing) 8/	...	...	...			94.2	95.2	89.2	89.0	87.8	87.4		87.3	87.6	87.3
Memorandum items:															
Nominal GDP (Billions of US dollars)	2.4	2.8	3.4			4.2	4.9	5.3	5.7	6.1	6.6		9.7	20.9	
Nominal dollar GDP growth	21.0	18.1	20.4			24.4	14.5	8.1	8.1	8.0	8.0	**11.8**	8.0	8.0	8.0
PV of PPG external debt (in Billions of US dollars)			0.2			0.3	0.3	0.4	0.5	0.6	0.7		1.3	2.9	
(PVt-PVt-1)/GDPt-1 (in percent)						1.2	0.9	1.6	1.4	1.5	1.6	1.4	1.6	0.8	1.3

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 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 3b.Rwanda: Sensitivity Analysis for Key Indicators of Public and Publicly Guaranteed External Debt, 2008-2028
(In percent)

	Projections							
	2008	2009	2010	2011	2012	2013	**2018**	2028
PV of debt-to GDP ratio								
Baseline	6.6	6.6	7.6	8.4	9.3	10.1	**13.5**	14.2
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2008-2028 1/	6.6	7.2	7.7	7.9	8.0	8.1	**10.0**	15.6
A2. New public sector loans on less favorable terms in 2008-2028 2	6.6	6.7	8.1	9.3	10.4	11.6	**15.9**	16.8
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2009-2010	6.6	6.8	7.9	8.7	9.6	10.5	**14.0**	14.7
B2. Export value growth at historical average minus one standard deviation in 2009-2010 3/	6.6	7.3	9.8	10.5	11.2	12.0	**15.1**	14.9
B3. US dollar GDP deflator at historical average minus one standard deviation in 2009-2010	6.6	8.0	10.5	11.6	12.7	13.9	**18.6**	19.5
B4. Net non-debt creating flows at historical average minus one standard deviation in 2009-2010 4/	6.6	10.1	13.1	13.7	14.4	15.1	**17.6**	15.9
B5. Combination of B1-B4 using one-half standard deviation shocks	6.6	11.6	17.5	18.1	18.9	19.7	**22.7**	20.0
B6. One-time 30 percent nominal depreciation relative to the baseline in 2009 5/	6.6	9.2	10.6	11.6	12.8	14.0	**18.7**	19.7
PV of debt-to-exports ratio								
Baseline	74	76	82	88	96	107	**134**	120
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2008-2028 1/	74	82	83	83	83	85	**99**	131
A2. New public sector loans on less favorable terms in 2008-2028 2	74	77	87	97	109	122	**158**	142
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2009-2010	74	76	82	88	96	107	**134**	120
B2. Export value growth at historical average minus one standard deviation in 2009-2010 3/	74	103	163	171	181	197	**232**	195
B3. US dollar GDP deflator at historical average minus one standard deviation in 2009-2010	74	76	82	88	96	107	**134**	120
B4. Net non-debt creating flows at historical average minus one standard deviation in 2009-2010 4/	74	115	141	144	150	159	**175**	134
B5. Combination of B1-B4 using one-half standard deviation shocks	74	128	192	195	202	213	**231**	173
B6. One-time 30 percent nominal depreciation relative to the baseline in 2009 5/	74	76	82	88	96	107	**134**	120
PV of debt-to-revenue ratio								
Baseline	47	46	52	57	63	67	**84**	79
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2008-2028 1/	47	50	53	54	54	54	**62**	86
A2. New public sector loans on less favorable terms in 2008-2028 2	47	47	56	63	71	77	**99**	93
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2009-2010	47	47	54	59	65	70	**87**	81
B2. Export value growth at historical average minus one standard deviation in 2009-2010 3/	47	51	67	71	76	80	**94**	82
B3. US dollar GDP deflator at historical average minus one standard deviation in 2009-2010	47	56	72	79	86	92	**116**	108
B4. Net non-debt creating flows at historical average minus one standard deviation in 2009-2010 4/	47	70	90	94	97	100	**110**	88
B5. Combination of B1-B4 using one-half standard deviation shocks	47	80	120	124	128	131	**141**	110
B6. One-time 30 percent nominal depreciation relative to the baseline in 2009 5/	47	64	72	79	87	93	**117**	109

Table 3b.Rwanda: Sensitivity Analysis for Key Indicators of Public and Publicly Guaranteed External Debt, 2008-2028 (continued)
(In percent)

Debt service-to-exports ratio								
Baseline	2.1	2.2	2.4	2.8	3.2	3.3	**4.3**	5.3
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2008-2028 1/	2.1	2.3	2.6	2.9	3.3	3.3	**4.2**	4.7
A2. New public sector loans on less favorable terms in 2008-2028 2	2.1	2.2	2.5	3.6	4.5	5.4	**8.0**	7.8
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2009-2010	2.1	2.2	2.4	2.8	3.2	3.3	**4.3**	5.3
B2. Export value growth at historical average minus one standard deviation in 2009-2010 3/	2.1	2.6	3.9	4.9	5.4	5.7	**7.0**	8.9
B3. US dollar GDP deflator at historical average minus one standard deviation in 2009-2010	2.1	2.2	2.4	2.8	3.2	3.3	**4.3**	5.3
B4. Net non-debt creating flows at historical average minus one standard deviation in 2009-2010 4/	2.1	2.2	3.0	3.7	4.0	4.2	**4.9**	6.4
B5. Combination of B1-B4 using one-half standard deviation shocks	2.1	2.4	3.8	5.0	5.3	5.5	**6.3**	8.4
B6. One-time 30 percent nominal depreciation relative to the baseline in 2009 5/	2.1	2.2	2.4	2.8	3.2	3.3	**4.3**	5.3
Debt service-to-revenue ratio								
Baseline	1.3	1.3	1.5	1.8	2.1	2.1	**2.7**	3.5
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2008-2028 1/	1.3	1.4	1.6	1.9	2.1	2.1	**2.6**	3.1
A2. New public sector loans on less favorable terms in 2008-2028 2	1.3	1.3	1.6	2.3	3.0	3.4	**5.0**	5.1
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2009-2010	1.3	1.3	1.6	1.9	2.1	2.2	**2.8**	3.6
B2. Export value growth at historical average minus one standard deviation in 2009-2010 3/	1.3	1.3	1.6	2.0	2.3	2.3	**2.8**	3.8
B3. US dollar GDP deflator at historical average minus one standard deviation in 2009-2010	1.3	1.6	2.1	2.5	2.8	2.9	**3.7**	4.8
B4. Net non-debt creating flows at historical average minus one standard deviation in 2009-2010 4/	1.3	1.3	1.9	2.4	2.6	2.6	**3.1**	4.2
B5. Combination of B1-B4 using one-half standard deviation shocks	1.3	1.5	2.4	3.1	3.4	3.4	**3.9**	5.4
B6. One-time 30 percent nominal depreciation relative to the baseline in 2009 5/	1.3	1.8	2.1	2.5	2.8	2.9	**3.7**	4.8
Memorandum item:								
Grant element assumed on residual financing (i.e., financing required above baseline) 6/	56	56	56	56	56	56	**56**	56

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.