

INTERNATIONAL MONETARY FUND
AND
INTERNATIONAL DEVELOPMENT ASSOCIATION
MALI

Joint IMF/IDA Debt Sustainability Analysis For Low Income Countries

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

Approved by Roger Nord and Tom Dorsey
and Sudhir Shetty and Carlos Braga (World Bank)

December 28, 2009

The 2009 debt sustainability analysis (DSA) indicates that Mali remains at a low risk of external debt distress.¹ The outlook remains broadly in line with the previous DSA, completed in May 2008 on the basis of end-2006 data, despite a less favorable baseline scenario linked to a stronger relative decline of the gold mining sector. Under baseline projections, none of the external debt indicators breach the policy dependent thresholds over the long run. Under scenarios that include shocks, the country would approach the thresholds for the ratios of the present value of debt to exports and to GDP. The fiscal DSA indicates sustainable debt dynamics even under stress.

The analysis highlights the need for prudent macroeconomic and financial policies, as stress tests suggest some potential threats to external debt sustainability. Debt vulnerabilities have increased somewhat as a result of taking into account more explicitly the decline over the next five to ten years of Mali's existing gold production, the country's main source of foreign exchange. One potential threat for public debt sustainability is borrowing on non-concessional terms. Mali should continue to finance its fiscal deficit primarily through external grants and concessional loans, and avoid recourse to costly medium- and long-term debt, external or domestic. Prudent fiscal policies, structural reforms to create an enabling environment for private sector development and to reduce vulnerability to shocks, and a strengthening of debt management would help Mali further reduce its risk of debt distress.

¹ A preliminary version of this DSA was discussed with the Malian authorities, who share staff views regarding the risk of debt distress.

I. BACKGROUND AND MACROECONOMIC ASSUMPTIONS

1. **As a result of the Highly Indebted Poor Countries (HIPC) Initiative and the Multilateral Debt Relief Initiative (MDRI), Mali's stock of external debt has declined significantly since 2002.**² Mali's stock of public and publicly guaranteed external debt declined from 90 percent of GDP in 2002 to 19 percent at end-2008. Total public external debt at end-2008 is estimated at US\$1.55 billion, with a net present value (NPV) estimated at the equivalent of 12 percent of GDP, 42 percent of exports, and 77 percent of budgetary revenue. These estimates are lower than the projections made for 2008 in the last DSA, mostly on the basis of a lower debt accumulation than projected and downward revisions to data on the stock of debt, reflecting more systematic recording of the cancellation of loans through debt relief.

2. **The baseline scenario reflects prudent macroeconomic projections and sound fiscal performance** (Box 1).³ The medium-term outlook envisages continued macroeconomic stability and sustained economic growth, supported by continued structural reforms and borrowing on concessional terms. Growth is expected to remain around the recent trend rate of 5 percent, despite a 20 percent decline in gold production by 2020 (it remains relatively stable thereafter).⁴ This decline results in slower growth of exports, larger current account deficits, and marginally lower GDP growth than in previous DSA exercises. The fiscal deficit (including grants), upon which net public borrowing depends, is projected to hover around 3½ percent of GDP throughout the DSA period.

² HIPC debt relief was granted by all multilaterals, Paris Club bilateral creditors, and three non-Paris Club creditors (Saudi Arabia, Kuwait and China). Negotiations with four countries are still ongoing.

³ The Poverty Reduction Strategy Paper (PRSP) is based on an annual economic growth of 7 percent. The teams assumed a more conservative approach, taking into account the historical trends, the projected decline of the gold mining sector, and the related difficult economic transition that requires a higher momentum of structural reforms.

⁴ Gold output accounted for about 7 percent of GDP and 75 percent of exports in 2009. Staff has analyzed an alternative baseline scenario with economic growth slightly above 4½ percent per year to illustrate a slower growth response of sectors, such as agriculture, to ongoing structural reforms and development policies; under this scenario, prudent macroeconomic policies help to keep the risk of debt distress at a low level; in the sensitivity analysis, only the ratio of the present value of debt to exports breaches slightly the threshold of 150 percent after 2025 under a most extreme shock hypothesis. This alternative baseline points to the need to monitor new indebtedness and to implement effective growth strategies in the future.

Box 1. Mali: Debt Sustainability Analysis, Macroeconomic Assumptions, 2009-2029

- Real GDP growth is projected to average 5 percent per year during 2009-19, in line with historical trends over the previous decade, before increasing to 5½ percent per year over 2019-29. The primary sector is projected to grow at 5-5½ percent a year as a result of supportive agricultural development policies. Agrobusiness, energy and construction activities will pull the secondary sector, despite the stability of the gold mining sector over time. Transportation and trade will remain the pillars of the tertiary sector. With population growth currently over 3½ percent, the baseline thus assumes limited per capita income growth (and therefore no decline in the grant element of lending).
- Consumer price inflation is projected to remain at about 2 percent per year, in line with the WAEMU convergence criterion.
- The basic fiscal deficit (total revenue minus total expenditure, excluding foreign financed capital projects and HIPC spending) hovers around 1 percent of GDP, in line with projected budgetary assistance. Including foreign-financed capital expenditure, the overall fiscal deficit remains stable around 7 percent of GDP. It is financed in equal parts by grants and loans. A temporary fiscal stimulus over the period 2009-12 is financed by the exceptional privatization receipts of the telecommunication parastatal SOTELMA. New public sector external borrowing is projected to carry a nominal interest rate of about 1 percent, with an average grant element of 45 percent. No new domestic medium or long-term borrowing is assumed other than the rollover of credit from the central bank.
- The current account balance is projected to deteriorate on average by nearly one percentage point of GDP to 10 percent of GDP over 2009-19, reflecting at first the fiscal stimulus and then the decline in gold exports. The current account improves slightly thereafter, as the stability of gold exports is more than compensated by growth in other exports, including food, cotton, and other minerals. The baseline assumes a successful transition of the economy from a dependence on gold exports—equivalent to 17 percent of GDP in 2009 and projected to decline to below 5 percent of GDP in 2029—to a more diversified economic base, with other exports rising from 6 to 12 percent of GDP over the same period.

II. RESULTS OF THE EXTERNAL DEBT SUSTAINABILITY ANALYSIS

3. Mali's external debt ratios are projected to increase gradually over time, but remain well below the applicable indicative debt thresholds over the period 2009–29 (Figure 1 and Table 1a).⁵ The debt ratios under the baseline scenario are broadly of the same

⁵ Based on the World Bank three-year average CPIA ratings, Mali is classified as a 'medium performer'. Consequently, the external debt burden thresholds relevant for Mali are (i) NPV of debt-to-exports ratio of 150 percent; (ii) NPV of debt-to-revenue of 250 percent; (iii) NPV of debt-to-GDP of 40 percent; and (iv) debt service-to-exports and revenue ratios of 20 and 30 percent, respectively.

magnitude as the ones of the previous DSA, but higher than under the historical scenario, which reflects the relative deterioration of projected economic performance compared with the past. Although the initial debt burden in 2008 is lower than had been projected in the previous DSA, the slower growth in exports (averaging 2 percent per year lower over the 20-year projection horizon) results in debt indicators that are similar. The NPV of debt is expected to climb from 13 percent of GDP in 2009 to 26 percent in 2029. As production from existing gold mines declines, the NPV of debt-to-exports ratio is projected to increase from 42 percent in 2008 to 122 percent in 2029. Debt service is not expected to exceed 5 percent of exports over the projection period.

4. **Sensitivity tests show that Mali's debt service capacity is relatively robust to the standard shocks** (Table 1b). Under an alternative scenario that assumes higher interest rates on public sector loans—in effect, recourse to less concessional external borrowing—the NPV of debt to exports ratio reaches 145 percent in 2029, uncomfortably near the threshold. The same ratio reaches 140 percent under an export-shock scenario that lowers permanently the ratio of exports to GDP by about 2 percentage points. The ratios of NPV of debt to GDP and debt service to exports remain comfortably below the thresholds under alternative scenarios with the full range of shocks.

5. **With no indicative threshold breached under a variety of scenarios, Mali remains at low risk of external debt distress.** One indicative threshold is approached after 20 years under the assumption of less concessional borrowing, but all other indicators are favorably placed. This outcome, however, relies on the implementation of prudent macroeconomic policies and structural reforms aiming at addressing the projected decline of the gold mining sector. Taking into account that Mali's economy remains highly vulnerable to external shocks, the risk of debt distress will have to be monitored regularly.

III. RESULTS OF THE PUBLIC DEBT SUSTAINABILITY ANALYSIS

6. **In the baseline scenario, Mali's public debt increases moderately over the projection period** (Figure 2 and Table 2a). Domestic debt is projected to decline to negligible levels, as there is no domestic financing of the budget. The NPV of debt to revenue (and grants) ratio is projected to increase from 76 percent in 2008 to 108 percent in 2029 (and to 131 percent excluding grants). The debt service to revenue ratio excluding grants is projected to remain below 6 percent from 2012 onward, following repayment of a medium-term loan taken from a consortium of sub-regional banks to clear domestic arrears. Thus, Mali's public debt is considered manageable from a fiscal perspective, as long as the authorities implement a cautious debt strategy and avoid recourse to domestic term financing.

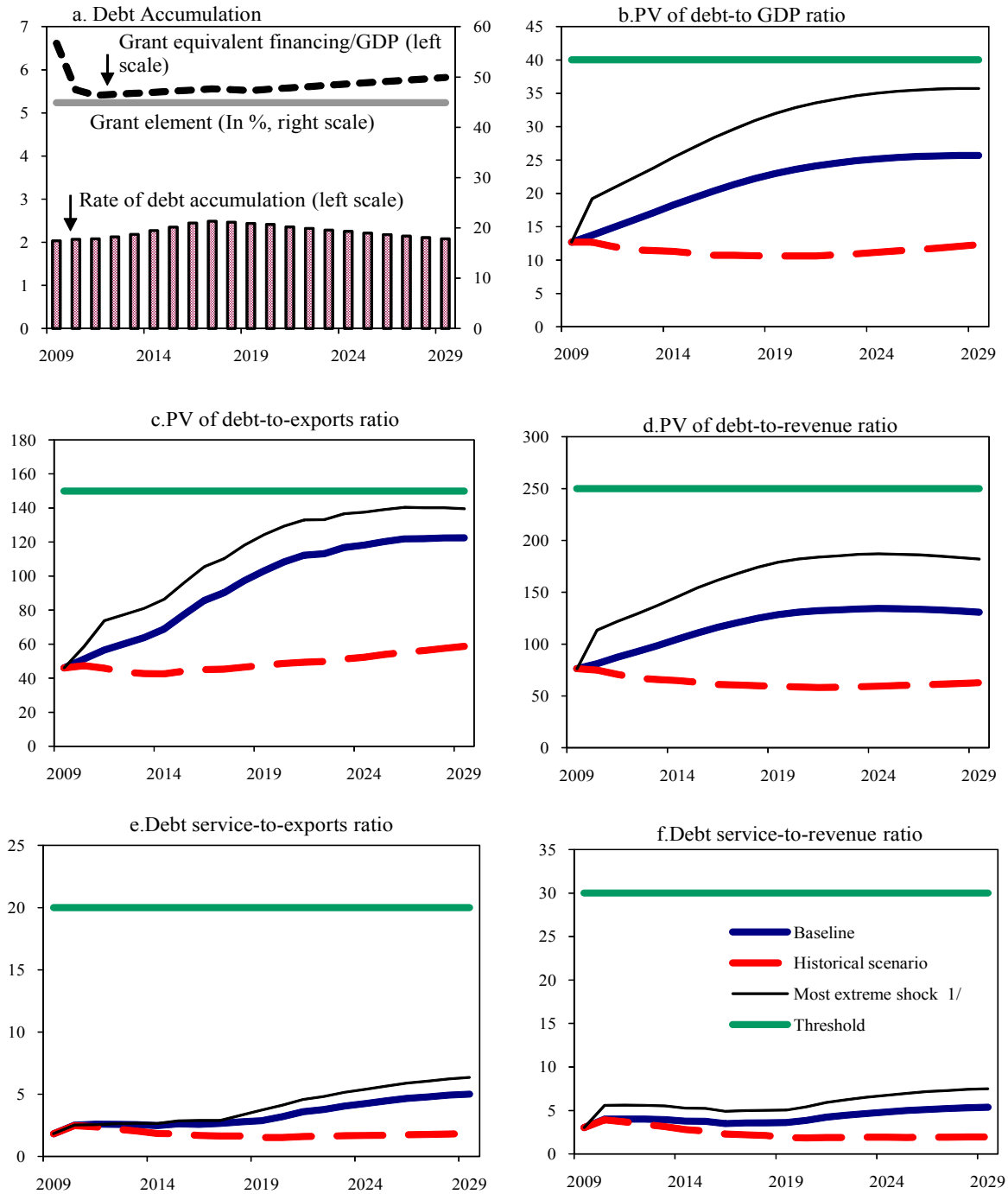
7. **Sensitivity analyses shows that Mali's public debt servicing capacity could become impaired in the face of shocks** (Table 2b). Specifically, reducing economic growth by an average of 1 percent per year would, with less buoyant fiscal revenues, raise public debt service ratios to levels that could potentially prove burdensome. However, with a relatively even profile of debt service after the amortization in 2010-12 of the regional

borrowing to reduce payment arrears, debt service ratios would remain comfortable under this scenario. Nevertheless, the sensitivity analysis underscores the importance of continuing to pursue prudent macroeconomic policies to achieve high GDP growth rates and low public sector deficits.

IV. CONCLUSION

8. **Mali's risk of external debt distress remains low, with debt indicators comparable to the 2008 DSA.** None of the debt burden thresholds are breached over the 20-year projection period, under either the baseline scenario or with the standard sensitivity analysis. Nevertheless, to ensure continued debt sustainability, it would be important for Mali to work to broaden the export base in the coming years, as well as to deepen fiscal consolidation, enhance competitiveness, and follow a prudent borrowing strategy.

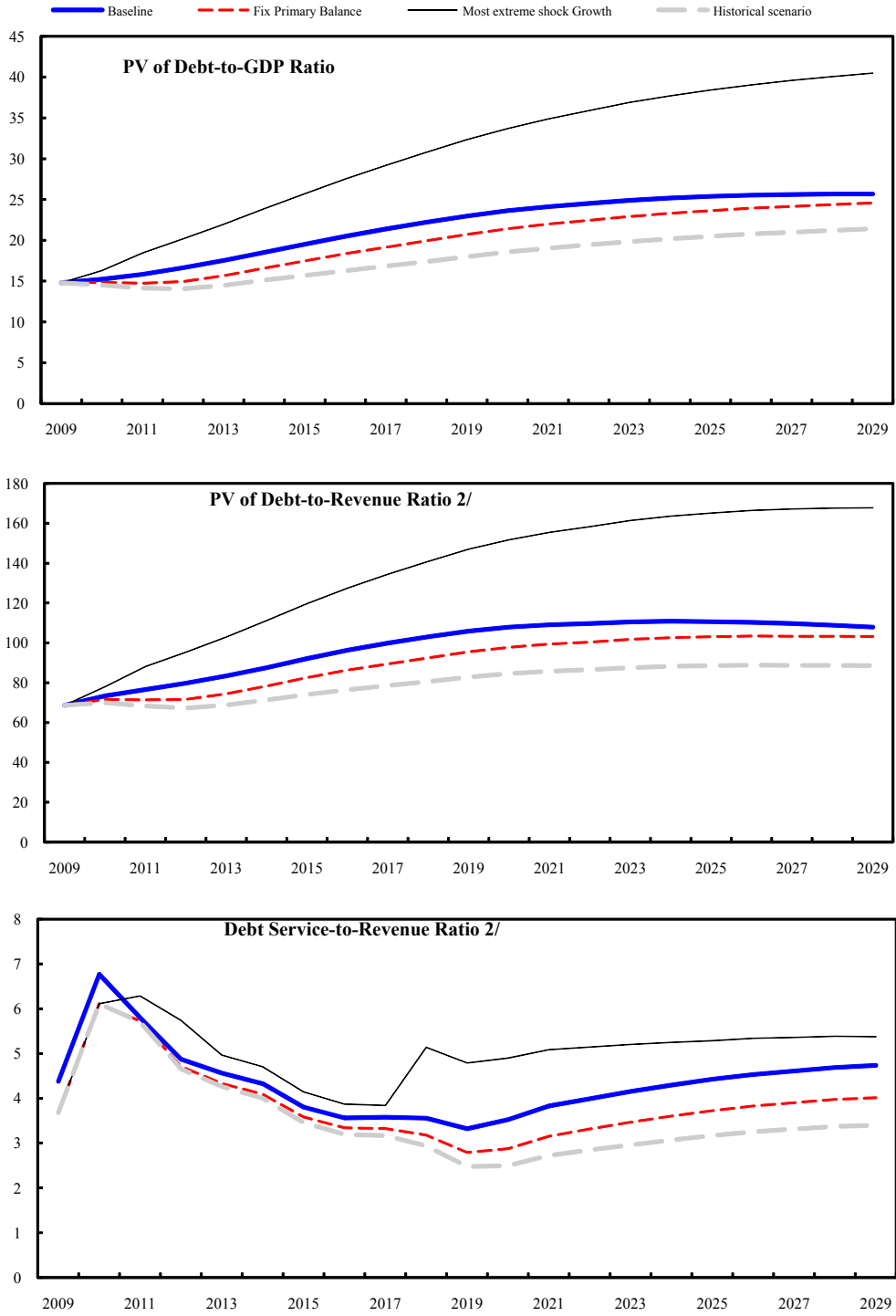
Figure 1. Mali: Indicators of Public and Publicly Guaranteed External Debt under Alternatives Scenarios, 2009-2029 1/



Sources: Country authorities; and staff estimates and projections.

1/ The most extreme stress test is the test that yields the highest ratio in 2019. 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 Terms shock and in figure f. to a One-time depreciation shock

Figure 2.Mali: Indicators of Public Debt Under Alternative Scenarios, 2009-2029 1/



Sources: Country authorities; and staff estimates and projections.

1/ The most extreme stress test is the test that yields the highest ratio in 2019.

2/ Revenues are defined inclusive of grants.

Table 1a. External Debt Sustainability Framework, Baseline Scenario, 2006-2029 1/
(In percent of GDP, unless otherwise indicated)

	Actual			Historical Average 7/	Standard Deviation	Projections									
	2006	2007	2008			2009	2010	2011	2012	2013	2014	2009-2014 Average	2019	2029	2015-2029 Average
External debt (nominal) 1/	18.9	19.4	19.1			20.2	22.2	24.2	26.1	28.0	30.0		36.8	39.8	
o/w public and publicly guaranteed (PPG)	18.9	19.4	19.1			20.2	22.2	24.2	26.1	28.0	30.0		36.8	39.8	
Change in external debt	-31.9	0.5	-0.3			1.1	2.0	2.0	1.9	1.9	1.9		1.0	0.0	
Identified net debt-creating flows	-6.3	-1.3	-2.6			-0.7	3.1	3.4	3.3	2.7	2.7		2.4	0.8	
Non-interest current account deficit	-0.4	3.4	2.7	3.4	2.8	4.8	5.1	5.7	5.6	5.1	5.2		4.9	3.7	
Deficit in balance of goods and services	5.1	9.0	10.9			7.7	9.8	10.1	9.8	9.4	9.3		10.9	11.3	
Exports	30.0	26.6	28.4			27.5	26.8	26.3	26.5	26.7	26.5		22.3	21.0	
Imports	35.1	35.6	39.3			35.2	36.6	36.3	36.3	36.2	35.8		33.2	32.3	
Net current transfers (negative = inflow)	-5.3	-5.5	-5.9	-4.7	0.7	-5.2	-5.3	-5.1	-4.8	-4.9	-4.5		-4.7	-5.1	
o/w official	-2.7	-1.8	-1.7			-2.1	-2.2	-2.0	-2.0	-2.0	-2.0		-2.0	-2.2	
Other current account flows (negative = net inflow)	-0.2	-0.1	-2.3			2.4	0.7	0.8	0.6	0.6	0.4		-1.3	-2.5	
Net FDI (negative = inflow)	-1.2	-2.3	-2.1	-2.2	1.0	-4.9	-1.3	-1.4	-1.4	-1.4	-1.3		-1.1	-0.9	
Endogenous debt dynamics 2/	-4.7	-2.3	-3.2			-0.7	-0.7	-0.9	-1.0	-1.1	-1.1		-1.5	-1.9	
Contribution from nominal interest rate	0.5	0.4	0.3			0.2	0.2	0.2	0.2	0.2	0.2		0.3	0.3	
Contribution from real GDP growth	-2.4	-0.7	-0.8			-0.8	-0.9	-1.1	-1.2	-1.3	-1.3		-1.7	-2.2	
Contribution from price and exchange rate changes	-2.8	-2.0	-2.8			0.5	-1.0	-0.3	-0.3	-0.3	-0.3		-0.7	-0.8	
Residual (3-4) 3/	-25.5	1.8	2.3			1.8	-1.1	-1.4	-1.3	-0.8	-0.8		-1.4	-0.9	
o/w exceptional financing	-34.6	-0.3	-0.3			-0.3	-0.3	0.0	0.0	0.0	0.0		0.0	0.0	
PV of external debt 4/	...	...	12.1			12.7	13.7	14.9	16.0	17.1	18.3		23.0	25.7
In percent of exports	...	...	42.7			46.1	51.4	56.6	60.2	63.8	68.8		103.2	122.4
PV of PPG external debt	...	...	12.1			12.7	13.7	14.9	16.0	17.1	18.3		23.0	25.7
In percent of exports	...	...	42.7			46.1	51.4	56.6	60.2	63.8	68.8		103.2	122.4
In percent of government revenues	...	...	77.9			76.3	81.2	87.4	92.8	98.5	104.8		128.6	130.8
Debt service-to-exports ratio (in percent) 5/	5.4	6.7	3.7			1.8	2.5	2.6	2.6	2.6	2.5		2.9	5.0	
PPG debt service-to-exports ratio (in percent)	5.4	6.7	3.7			1.8	2.5	2.6	2.6	2.6	2.5		2.9	5.0	
PPG debt service-to-revenue ratio (in percent)	9.3	10.6	6.7			3.0	4.0	4.0	4.0	3.9	3.8		3.6	5.4	
Total gross financing need (Billions of U.S. dollars)	0.0	0.2	...			0.0	0.4	0.5	0.6	0.5	0.6		0.8	1.4	
Non-interest current account deficit that stabilizes debt ratio	31.5	2.9	3.0			3.7	3.1	3.7	3.7	3.2	3.3		3.9	3.7	
Key macroeconomic assumptions															
Real GDP growth (in percent)	5.3	4.3	5.0	4.9	3.8	4.3	4.8	5.3	5.2	5.2	5.0	5.0	5.2	5.9	
GDP deflator in US dollar terms (change in percent)	5.9	12.0	16.7	6.8	9.6	-2.7	5.2	1.4	1.2	1.1	0.9	1.2	2.0	2.0	
Effective interest rate (percent) 6/	1.1	2.2	2.1	1.4	0.6	0.8	1.0	1.0	0.9	0.9	0.9	0.9	0.8	0.8	
Growth of exports of G&S (US dollar terms, in percent)	36.4	3.5	30.9	15.2	15.0	-1.6	7.1	4.7	7.6	7.3	5.1	5.0	4.7	8.2	
Growth of imports of G&S (US dollar terms, in percent)	17.2	18.3	35.4	15.1	14.7	-9.0	14.4	6.0	6.6	5.9	4.9	4.8	5.9	8.2	
Grant element of new public sector borrowing (in percent)	...	...	...	...	...	44.9	44.9	44.9	44.9	44.9	44.9	44.9	44.9	44.9
Government revenues (excluding grants, in percent of GDP)	17.3	16.7	15.5	...	...	16.6	16.9	17.0	17.2	17.3	17.4	...	17.9	19.6
Aid flows (in Billions of US dollars) 8/	0.6	0.6	0.5	...	...	0.8	0.7	0.8	0.8	0.9	1.0	...	1.3	3.0
o/w Grants	0.3	0.3	0.3	...	...	0.4	0.4	0.4	0.4	0.4	0.5	...	0.7	1.6
o/w Concessional loans	0.3	0.2	0.2	...	...	0.3	0.4	0.4	0.4	0.5	0.5	...	0.7	1.4
Grant-equivalent financing (in percent of GDP) 9/	...	...	...	...	...	6.6	5.5	5.4	5.4	5.5	5.5	...	5.5	5.8
Grant-equivalent financing (in percent of external financing) 9/	...	...	...	...	...	76.3	72.6	71.8	71.8	71.8	71.7	...	72.5	74.1
Memorandum items:															
Nominal GDP (Billions of US dollars)	6.1	7.2	8.8	...	...	8.9	9.8	10.5	11.1	11.9	12.6	...	17.7	37.7
Nominal dollar GDP growth	11.5	16.8	22.5	...	...	1.5	10.2	6.7	6.5	6.4	6.0	6.2	7.3	8.1
PV of PPG external debt (in Billions of US dollars)	...	...	1.0	...	...	1.2	1.3	1.5	1.8	2.0	2.3	...	4.0	9.6
(Pvt-Pvt-1)/GDPI-1 (in percent)	...	...	...	...	...	2.0	2.1	2.1	2.1	2.2	2.3	2.1	2.4	2.1

Sources: Country authorities; and staff estimates and projections.

1/ Includes both public and private sector external debt.

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

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

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

5/ Debt service after 2008 fully reflects HIPC and MDRI debt relief.

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 PV of new debt).

Table 1b. Mali: Sensitivity Analysis for Key Indicators of Public and Publicly Guaranteed External Debt, 2009-2029
(In percent)

	Projections						
	2009	2010	2011	2012	2013	2019	2029
PV of debt-to GDP ratio							
Baseline	13	14	15	16	17	23	26
A. Alternative Scenarios							
A1. Key variables at their historical averages in 2009-2029 1/	13	13	12	12	11	11	12
A2. New public sector loans on less favorable terms in 2009-2029 2	13	14	16	17	18	26	30
B. Bound Tests							
B1. Real GDP growth at historical average minus one standard deviation in 2010-2011	13	14	16	17	18	25	28
B2. Export value growth at historical average minus one standard deviation in 2010-2011 3/	13	15	17	18	19	25	26
B3. US dollar GDP deflator at historical average minus one standard deviation in 2010-2011	13	15	17	18	19	26	29
B4. Net non-debt creating flows at historical average minus one standard deviation in 2010-2011 4/	13	15	16	17	18	24	26
B5. Combination of B1-B4 using one-half standard deviation shocks	13	15	16	17	18	25	27
B6. One-time 30 percent nominal depreciation relative to the baseline in 2010 5/	13	19	21	22	24	32	36
PV of debt-to-exports ratio							
Baseline	46	51	57	60	64	103	122
A. Alternative Scenarios							
A1. Key variables at their historical averages in 2009-2029 1/	46	47	46	44	43	48	59
A2. New public sector loans on less favorable terms in 2009-2029 2	46	53	59	64	69	117	145
B. Bound Tests							
B1. Real GDP growth at historical average minus one standard deviation in 2010-2011	46	51	56	60	64	103	122
B2. Export value growth at historical average minus one standard deviation in 2010-2011 3/	46	59	74	77	81	124	140
B3. US dollar GDP deflator at historical average minus one standard deviation in 2010-2011	46	51	56	60	64	103	122
B4. Net non-debt creating flows at historical average minus one standard deviation in 2010-2011 4/	46	54	62	66	69	108	124
B5. Combination of B1-B4 using one-half standard deviation shocks	46	53	56	59	63	100	118
B6. One-time 30 percent nominal depreciation relative to the baseline in 2010 5/	46	51	56	60	64	103	122
PV of debt-to-revenue ratio							
Baseline	76	81	87	93	99	129	131
A. Alternative Scenarios							
A1. Key variables at their historical averages in 2009-2029 1/	76	75	71	67	66	59	63
A2. New public sector loans on less favorable terms in 2009-2029 2	76	83	92	99	107	146	155
B. Bound Tests							
B1. Real GDP growth at historical average minus one standard deviation in 2010-2011	76	84	94	100	106	138	140
B2. Export value growth at historical average minus one standard deviation in 2010-2011 3/	76	87	102	107	112	139	133
B3. US dollar GDP deflator at historical average minus one standard deviation in 2010-2011	76	88	98	104	111	144	147
B4. Net non-debt creating flows at historical average minus one standard deviation in 2010-2011 4/	76	86	96	101	107	134	132
B5. Combination of B1-B4 using one-half standard deviation shocks	76	88	95	101	107	138	139
B6. One-time 30 percent nominal depreciation relative to the baseline in 2010 5/	76	113	122	129	137	179	182

Table 1b. Mali: Sensitivity Analysis for Key Indicators of Public and Publicly Guaranteed External Debt, 2009-2029 (continued)
(In percent)

	Projections						
	2009	2010	2011	2012	2013	2019	2029
Debt service-to-exports ratio							
Baseline	1.84	2.53	2.59	2.59	2.56	2.89	5.02
A. Alternative Scenarios							
A1. Key variables at their historical averages in 2009-2029 1/	2	2	2	2	2	2	2
A2. New public sector loans on less favorable terms in 2009-2029 2	2	3	3	3	3	4	6
B. Bound Tests							
B1. Real GDP growth at historical average minus one standard deviation in 2010-2011	2	3	3	3	3	3	5
B2. Export value growth at historical average minus one standard deviation in 2010-2011 3/	2	3	3	3	3	4	6
B3. US dollar GDP deflator at historical average minus one standard deviation in 2010-2011	2	3	3	3	3	3	5
B4. Net non-debt creating flows at historical average minus one standard deviation in 2010-2011 4/	2	3	3	3	3	3	5
B5. Combination of B1-B4 using one-half standard deviation shocks	2	3	3	3	2	3	5
B6. One-time 30 percent nominal depreciation relative to the baseline in 2010 5/	2	3	3	3	3	3	5
Debt service-to-revenue ratio							
Baseline	3	4	4	4	4	4	5
A. Alternative Scenarios							
A1. Key variables at their historical averages in 2009-2029 1/	3	4	4	3	3	2	2
A2. New public sector loans on less favorable terms in 2009-2029 2	3	4	4	4	4	5	7
B. Bound Tests							
B1. Real GDP growth at historical average minus one standard deviation in 2010-2011	3	4	4	4	4	4	6
B2. Export value growth at historical average minus one standard deviation in 2010-2011 3/	3	4	4	4	4	4	6
B3. US dollar GDP deflator at historical average minus one standard deviation in 2010-2011	3	4	5	5	4	4	6
B4. Net non-debt creating flows at historical average minus one standard deviation in 2010-2011 4/	3	4	4	4	4	4	6
B5. Combination of B1-B4 using one-half standard deviation shocks	3	4	4	4	4	4	6
B6. One-time 30 percent nominal depreciation relative to the baseline in 2010 5/	3	6	6	6	6	5	8
<i>Memorandum item:</i>							
Grant element assumed on residual financing (i.e., financing required above baseline) 6/	42	42	42	42	42	42	42

Sources: Country authorities; and staff estimates and projections.

1/ Variables include real GDP growth, growth of GDP deflator (in U.S. dollar terms), non-interest current account in percent of GDP, and non-debt creating flows.

2/ Assumes that the interest rate on new borrowing is by 2 percentage points higher than in the baseline., while grace and maturity periods are the same as in the baseline.

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

4/ Includes official and private transfers and FDI.

5/ Depreciation is defined as percentage decline in dollar/local currency rate, such that it never exceeds 100 percent.

6/ Applies to all stress scenarios except for A2 (less favorable financing) in which the terms on all new financing are as specified in footnote 2.

Table 2a. Mali: Public Sector Debt Sustainability Framework, Baseline Scenario, 2006-2029
(In percent of GDP, unless otherwise indicated)

	Actual			Average 5/ Standard Deviation	Estimate					Projections					
	2006	2007	2008		2009	2010	2011	2012	2013	2014	2009-14 Average	2019	2029	2015-29 Average	
Public sector debt 1/	18.9	19.4	21.6			22.3	23.7	25.2	26.8	28.5	30.2		36.8	39.8	
o/w foreign-currency denominated	18.9	19.4	19.1			20.2	22.2	24.2	26.1	28.0	30.0		36.8	39.8	
Change in public sector debt	-31.9	0.5	2.3			0.7	1.4	1.5	1.6	1.7	1.7		1.0	0.0	
Identified debt-creating flows	-41.6	-0.2	-0.2			-4.0	1.9	2.6	2.5	1.8	1.6		0.7	-0.1	
Primary deficit	2.1	2.8	1.9	2.2	0.7	2.7	3.4	3.8	3.7	3.1	2.9	3.2	2.9	2.6	2.8
Revenue and grants	22.3	21.3	19.0			21.6	20.8	20.7	20.9	21.0	21.1		21.7	23.8	22.3
of which: grants	5.0	4.6	3.4			4.9	3.8	3.7	3.7	3.7	3.7		3.8	4.2	3.9
Primary (noninterest) expenditure	24.4	24.1	20.8			24.3	24.2	24.5	24.6	24.1	24.0		24.6	26.4	25.2
Automatic debt dynamics	-9.1	-2.5	-0.8			-2.1	-1.2	-1.2	-1.2	-1.3	-1.3		-2.2	-2.7	
Contribution from interest rate/growth differential	-3.5	-0.9	-0.9			-1.1	-1.1	-1.2	-1.4	-1.5	-1.6		-2.1	-2.7	
of which: contribution from average real interest rate	-1.0	-0.1	0.0			-0.2	0.0	0.0	-0.1	-0.2	-0.2		-0.4	-0.4	
of which: contribution from real GDP growth	-2.5	-0.8	-0.9			-0.9	-1.0	-1.2	-1.2	-1.3	-1.4		-1.8	-2.2	
Contribution from real exchange rate depreciation	-5.6	-1.6	0.1			-1.1	-0.1	0.0	0.1	0.2	0.3		...	...
Other identified debt-creating flows	-34.6	-0.4	-1.3			-4.5	-0.3	0.0	0.0	0.0	0.0		0.0	0.0	
Privatization receipts (negative)	0.0	0.0	-1.0			-4.2	-0.1	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)	-34.6	-0.4	-0.3			-0.3	-0.3	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	9.8	0.7	2.5			4.7	-0.5	-1.1	-0.8	-0.1	0.2		0.2	0.1	0.2
Other Sustainability Indicators															
PV of public sector debt	0.0	0.0	14.7			14.8	15.2	15.8	16.6	17.5	18.5		23.0	25.7	
o/w foreign-currency denominated	0.0	0.0	12.1			12.7	13.7	14.9	16.0	17.1	18.3		23.0	25.7	
o/w external	...	...	12.1			12.7	13.7	14.9	16.0	17.1	18.3		23.0	25.7	
PV of contingent liabilities (not included in public sector debt)	...	...	...			...	...	...	...	...	...		...	...
Gross financing need 2/	3.7	4.6	2.9			3.6	4.8	5.0	4.7	4.0	3.8		3.6	3.7	
PV of public sector debt-to-revenue and grants ratio (in percent)	0.0	0.0	77.2			68.6	73.4	76.6	79.7	83.4	87.6		105.9	107.9	
PV of public sector debt-to-revenue ratio (in percent)	0.0	0.0	94.2			89.0	90.0	93.2	96.8	101.2	106.3		128.6	130.8	
o/w external 3/	...	...	77.9			76.3	81.2	87.4	92.8	98.5	104.8		128.6	130.8	
Debt service-to-revenue and grants ratio (in percent) 4/	7.2	8.5	5.5			4.4	6.8	5.8	4.9	4.6	4.3		3.3	4.7	
Debt service-to-revenue ratio (in percent) 4/	9.3	10.8	6.7			5.7	8.3	7.1	5.9	5.5	5.3		4.0	5.7	
Primary deficit that stabilizes the debt-to-GDP ratio	34.0	2.3	-0.4			2.0	2.0	2.3	2.0	1.4	1.1		1.9	2.6	
Key macroeconomic and fiscal assumptions															
Real GDP growth (in percent)	5.3	4.3	5.0	4.9	3.8	4.3	4.8	5.3	5.2	5.2	5.0	5.0	5.2	5.9	5.5
Average nominal interest rate on forex debt (in percent)	1.1	2.2	2.1	1.4	0.6	0.8	1.0	1.0	0.9	0.9	0.9	0.9	0.8	0.8	0.8
Average real interest rate on domestic debt (in percent)	...	...	...			...	...	...	...	...	...		...	...
Real exchange rate depreciation (in percent, + indicates depreciation)	-11.8	-9.1	0.6	-5.6	9.3	-6.0	...	...	...	...	...		...	...
Inflation rate (GDP deflator, in percent)	5.1	2.6	8.6	3.6	3.7	4.3	2.6	1.8	2.0	2.0	2.1	2.5	2.0	2.0	2.0
Growth of real primary spending (deflated by GDP deflator, in percent)	0.1	0.0	-0.1	0.1	0.1	0.2	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1
Grant element of new external borrowing (in percent)	...	...	...	...	...	44.9	44.9	44.9	44.9	44.9	44.9	44.9	44.9	44.9	...

Sources: Country authorities; and 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 2b. Mali: Sensitivity Analysis of Key indicators of Public Debt 2009-2029

	Projections							
	2009	2010	2011	2012	2013	2014	2019	2029
PV of Debt-to-GDP Ratio								
Baseline	15	15	16	17	18	19	23	26
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	15	15	14	14	14	15	18	21
A2. Primary balance is unchanged from 2009	15	15	15	15	16	17	21	25
A3. Permanently lower GDP growth 1/	15	16	16	18	19	21	30	48
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2010-2011	15	16	18	20	22	24	32	40
B2. Primary balance is at historical average minus one standard deviations in 2010-2011	15	15	15	16	17	18	22	26
B3. Combination of B1-B2 using one half standard deviation shocks	15	15	15	16	18	19	26	32
B4. One-time 30 percent real depreciation in 2010	15	20	20	20	20	20	22	23
B5. 10 percent of GDP increase in other debt-creating flows in 2010	15	22	22	23	24	24	28	29
PV of Debt-to-Revenue Ratio 2/								
Baseline	69	73	77	80	83	88	106	108
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	69	70	68	67	69	71	83	89
A2. Primary balance is unchanged from 2009	69	72	71	72	74	78	96	103
A3. Permanently lower GDP growth 1/	69	75	79	84	90	97	135	195
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2010-2011	69	78	88	95	103	111	147	168
B2. Primary balance is at historical average minus one standard deviations in 2010-2011	69	72	72	76	79	84	103	108
B3. Combination of B1-B2 using one half standard deviation shocks	69	72	72	78	84	90	119	135
B4. One-time 30 percent real depreciation in 2010	69	96	95	94	94	95	102	95
B5. 10 percent of GDP increase in other debt-creating flows in 2010	69	105	108	109	112	115	128	120
Debt Service-to-Revenue Ratio 2/								
Baseline	4	7	6	5	5	4	3	5
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	4	6	6	5	4	4	2	3
A2. Primary balance is unchanged from 2009	4	6	6	5	4	4	3	4
A3. Permanently lower GDP growth 1/	4	6	6	5	5	5	4	7
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2010-2011	4	6	6	5	5	5	4	7
B2. Primary balance is at historical average minus one standard deviations in 2010-2011	4	6	6	5	4	4	3	4
B3. Combination of B1-B2 using one half standard deviation shocks	4	6	6	5	5	4	3	5
B4. One-time 30 percent real depreciation in 2010	4	7	7	6	6	6	5	7
B5. 10 percent of GDP increase in other debt-creating flows in 2010	4	6	6	6	5	5	5	5

Sources: Country authorities; and staff estimates and projections.

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

2/ Revenues are defined inclusive of grants.