INTERNATIONAL DEVELOPMENT ASSOCIATION
AND
INTERNATIONAL MONETARY FUND

MALI

Joint IDA/IMF Debt Sustainability Analysis Under the Debt Sustainability Framework for Low-Income Countries

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November 23, 2011

Mali's risk of debt distress continues to be assessed as moderate—unchanged from the previous Debt Sustainability Analysis (DSA). Like in the previous assessment, debt sustainability remains mostly sensitive to an export shock, owing to the expected decline in gold exports in the medium term and the uncertain prospects for export diversification, and a hardening of financial terms. There is scope for borrowing of about 1 percent of GDP that may fall short of the 35 percent grant element under the IMF and the World Bank policy, tied to infrastructure investment projects with a high rate of return. Nonetheless, given the uncertainties about the medium term exports outlook, the government should continue to limit most of its recourse to external financing to grants and concessional loans.

I. BACKGROUND

A. Recent Developments in Public External Debt

1. **As a result of the enhanced Highly Indebted Poor Countries (HIPC) Initiative and the Multilateral Debt Relief Initiative (MDRI), Mali's stock of external debt has declined significantly**. Mali's stock of public and publicly guaranteed external debt declined from 103 percent of GDP in 2000 to 19 percent in 2006 owing to enhanced HIPC debt relief in 2002 and MDRI debt relief in 2006 (Text Table 1). At end-2010, it had increased to 24.4 percent of GDP owing mainly to new loans by the International Development Association (IDA), the African Development Bank (ADB), the Islamic Development Bank (IsDB) and the IMF (mainly through an allocation of SDR 74 million in 2009). All of Mali's external debt is public and the bulk is owed to multilateral creditors, mainly IDA, AfDB and IsDB.

Text Table 1: Mali: External Debt Stock at Year-End, 2000-2010 (billions of CFAF)											
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Total	1939.7	1968.6	1156.1	1169.4	1184.5	1474.3	606.4	697.8	810.8	955.2	1134.1
(percent of GDP)	102.6	89.0	52.0	47.7	45.0	50.9	18.9	20.4	20.7	22.6	24.4
Multilateral	1434.9	1503.9	824.5	741.5	878.3	1198.8	357.3	447.6	615.9	766.8	895.8
IMF 1/	105.9	110.1	100.1	94.5	78.8	65.7	4.1	6.1	18.6	67.6	72.1
World Bank/IDA	327.6	343.3	106.0	176.5	268.3	383.5	83.8	216.3	262.5	313.2	413.6
African Development Bank	391.8	328.9	116.0	239.2	289.4	379.7	121.4	133.7	112.3	136.3	157.7
Islamic Development Bank	50.0	45.0	40.5	36.4	54.7	63.9	31.4	57.3	96.3	111.8	113.8
Others	559.6	676.5	461.9	154.9	187.0	290.6	64.0	109.1	129.1	137.9	138.6
Bilateral	498.2	459.0	328.4	423.5	301.9	270.0	246.9	247.7	194.9	188.4	235.8
Paris Club official debt	141.7	127.4	30.6	7.6	16.9	17.7	13.0	15.6	4.4	4.4	10.2
Non-Paris Club official debt	356.5	331.6	297.8	415.9	285.0	252.3	233.8	177.7	145.3	184.0	225.5
Other Creditors	7.3	7.4	4.3	4.4	4.4	5.5	2.3	2.5	2.8	2.9	2.6

Source: Malian authorities, staff estimates.

1/ Includes August 2009 SDR allocation.

B. Recent Developments in Public Domestic Debt

2. **Mali's domestic public debt is small** (4.4 percent of GDP in 2010, Text Table 2). It is composed of treasury bills and bonds issued on the regional market of the West African Economic and Monetary Union (WAEMU), and commercial banks' loans. Domestic debt has more than doubled in 2010 compared with 2009 mainly as a result of new issuances of treasury bills and bonds (CFAF 99 billion), but also owing to an inventory of all loans contracted or guaranteed by the government that the authorities have been conducting as part of their plan to strengthen debt management.

Text Table 2: Mali: Public Domestic Debt Stock at Year-End, 2000-2010 (billions of CFAF)											
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Total	20.8	58.5	48.7	37.5	36.0	61.6	45.4	80.2	74.1	90.3	203.4
(percent of GDP)	1.1	2.6	2.2	1.5	1.4	2.1	1.4	2.3	1.9	2.1	4.4
Debt to the Central Bank	3.0	25.8	25.1	23.1	20.3	17.9	15.3	13.1	10.7	8.3	5.8
Central Bank Statutory Advances	0.0	23.2	23.2	21.7	19.7	17.5	15.3	13.1	10.7	8.3	5.8
Other debt to the Central Bank	3.0	2.6	1.9	1.4	0.6	0.4	0.0	0.0	0.0	0.0	0.0
Debt to the banking sector	17.8	32.7	23.6	14.4	15.7	43.6	30.0	67.1	63.4	82.0	197.5

Source: Malian authorities, staff estimates.

C. Debt Burden Thresholds Under the Debt Sustainability Framework

3. **Mali is a medium policy performer for the purpose of determining the debt burden thresholds under the Debt Sustainability Framework (DSF)**. Mali's rating on the World Bank's Country Policy and Institutional Assessment (CPIA) averaged 3.65 (on a scale of 1 to 6) during 2008–10, making it a medium policy performer. The corresponding external public debt burden thresholds are shown in Text Table 3.

Text Table 3. External Public Debt Burden Thresholds for "Medium Policy Performers" under the Debt Sustainability Framework	
Present value of external debt in percent of:	
GDP	40
Exports	150
Revenue	250
External debt service in percent of:	
Exports	20
Revenue	30

II. Baseline Scenario Underlying the Debt Sustainability Analysis

4. **The central feature of Mali's medium- and long-term macroeconomic outlook is the steady decline of annual gold production expected to be compensated only in part by other exports**. The baseline scenario assumes a continuation of trend growth as

Box 1. Mali: Macroeconomic Assumptions Underlying the Baseline Scenario, 2011–31

- **Real GDP** growth is projected to average 5.2 percent per year, slightly above the trend observed during the last 10 years (5.0 percent). Gold output is expected to decline by about 2 percent annually starting in 2014. Higher agricultural production is expected to outweigh this decline over time owing to cotton and other agricultural sector reforms. With population growth currently over 3.6 percent, the baseline scenario thus assumes low per capita income growth (and therefore no decline in the grant element of lending).
- **Consumer price inflation** is projected to remain below the WAEMU convergence criterion of 3 percent.
- **Fiscal policy.** The basic fiscal balance (revenue plus budgetary grants minus domestically financed expenditure) is expected to be equal to or greater than zero in order to meet the WAEMU convergence criterion. Tax revenue and domestically financed expenditure are expected to increase in sync by about 6 percent of GDP during 2011-31. Therefore, there is no recourse to domestic borrowing to finance the budget, except for rolling over current stock of domestic debt at market rates. In 2009–13, the basic fiscal balance departs slightly from that underlying trend as a temporary fiscal stimulus of about 4 percent of GDP is being implemented with the proceeds of the privatization of the state telecom company SOTELMA. Starting in 2014, the overall fiscal deficit (excluding grants) is projected to remain around 5.2 percent of GDP, and to be financed by external loans for 50 percent and grants for the balance.
- **Non-concessional borrowing**. Over the period 2012-14, about $100 million (1 percent of GDP), or about 10 percent of total external borrowing, is assumed to be borrowed on commercial terms (8 percent interest rate, 10 year maturity) in order to finance infrastructure investment projects with a high rate of return. These projects remain to be identified. Starting in 2015, about 0.3 percent of GDP or 10 percent of total borrowing is assumed to continue to be on commercial terms. Public sector external debt is expected to carry an effective interest rate slightly above the historical average of 1.3 percent. No new domestic medium or long-term borrowing is assumed other than the rollover of treasury bills and bonds.
- **The non-interest current account deficit** is projected to stay close to the historic average (4.2 percent of GDP) over 2011–31. Gold exports volumes are expected to decline steadily over time, and the share of gold in total exports is projected to fall from 75 percent in 2011 to about 33 percent in 2031. This decline is projected to be compensated by a gradual increase of other exports (including food, cotton, and other minerals such as cement, phosphate, uranium, bauxite, iron ore, copper, nickel, oil) and a reduction of imports.

agriculture offsets the steady decline of gold production (Box 1). Inflation is expected to remain moderate as prudent fiscal policies are implemented with no recourse to domestic borrowing. The current account deficit is expected to remain stable, as the decline in gold exports is compensated by an increase of other exports including agricultural products and other minerals and a decrease in imports.

III. Debt Sustainability Analysis

A. External Debt

5. **Under the baseline assumptions, all external debt and debt-service ratios remain below the policy-dependent thresholds throughout the projection period** (Figure 1). The present value (PV) of external debt is expected to climb from 16 percent of GDP in 2011 to 20 percent in 2031 (Figure 1b, Table 1a). As production from existing gold mines declines starting in 2014 and other exports' growth only partly compensates for that decline, the PV of the external debt-to-exports ratio is projected to increase from 59 percent in 2011 to 116 percent in 2031, below the threshold of 150 percent (Figure 1c, Table 1a). With projected increase in tax revenue by 6 percent of GDP during the projection period, the PV of the external debt-to-revenue ratio is projected to hover around 87-99 percent of GDP, which is significantly below the threshold of 250 percent (Figure 1d, Table 1a).

6. **Mali's external debt sustainability is mostly sensitive to an export shock and a hardening of financial terms, limiting the scope for non-concessional borrowing**. Under a bound test that reduces exports *growth* temporarily in 2012-13 with the effect of reducing exports *levels* permanently by 25 percent, the PV of the debt-to-exports ratio would exceed the threshold in the year 2020 and remain high until the end of the projection period (Figure 1c; Table 1b, Scenario B2). Under a hardening of financial terms, the PV of debt-to-exports ratio would breach the threshold by a large margin in the second half of the projection period and for a protracted period of time (Table 1b, Scenario A2). The sensitivity of Mali's external debt sustainability to an export shock and a hardening of financial terms and the uncertainties about the medium term exports outlook indicate that the scope for non-concessional borrowing is limited.

B. Public Debt

7. **The inclusion of domestic debt does not alter the assessment of Mali's debt sustainability**. Given the small size of Mali's domestic debt and the absence of recourse to domestic borrowing in the base line scenario, the public debt sustainability analysis closely mirrors the external debt sustainability analysis (Figure 2 and Table 2a). The PV of debt-to-GDP ratio hardly increases from 20 percent in 2011 to 21 percent in 2031.

8. **Mali's total public debt sustainability is most sensitive to a fiscal shock.** In particular, maintaining the fiscal impulse resulting from the spending of the SOTELMA

privatization income in 2011 through the projection period would sharply increase the PV of debt-to-GDP ratio to 37 percent in 2031 (Figure 2; Table 2b, Scenario A2).

C. Comparison with the Previous Debt Sustainability Analysis

9. **Mali's debt vulnerabilities have remained broadly unchanged since the 2010 DSA**. The baseline scenario remains broadly in line with the previous DSA.[1] As in last year's DSA, none of the debt indicators breach the external public debt burden thresholds throughout the projection period under the baseline scenario, and Mali's external debt sustainability remains mostly sensitive to an export shock and to a hardening of financial terms (¶6).

D. The Authorities' Views

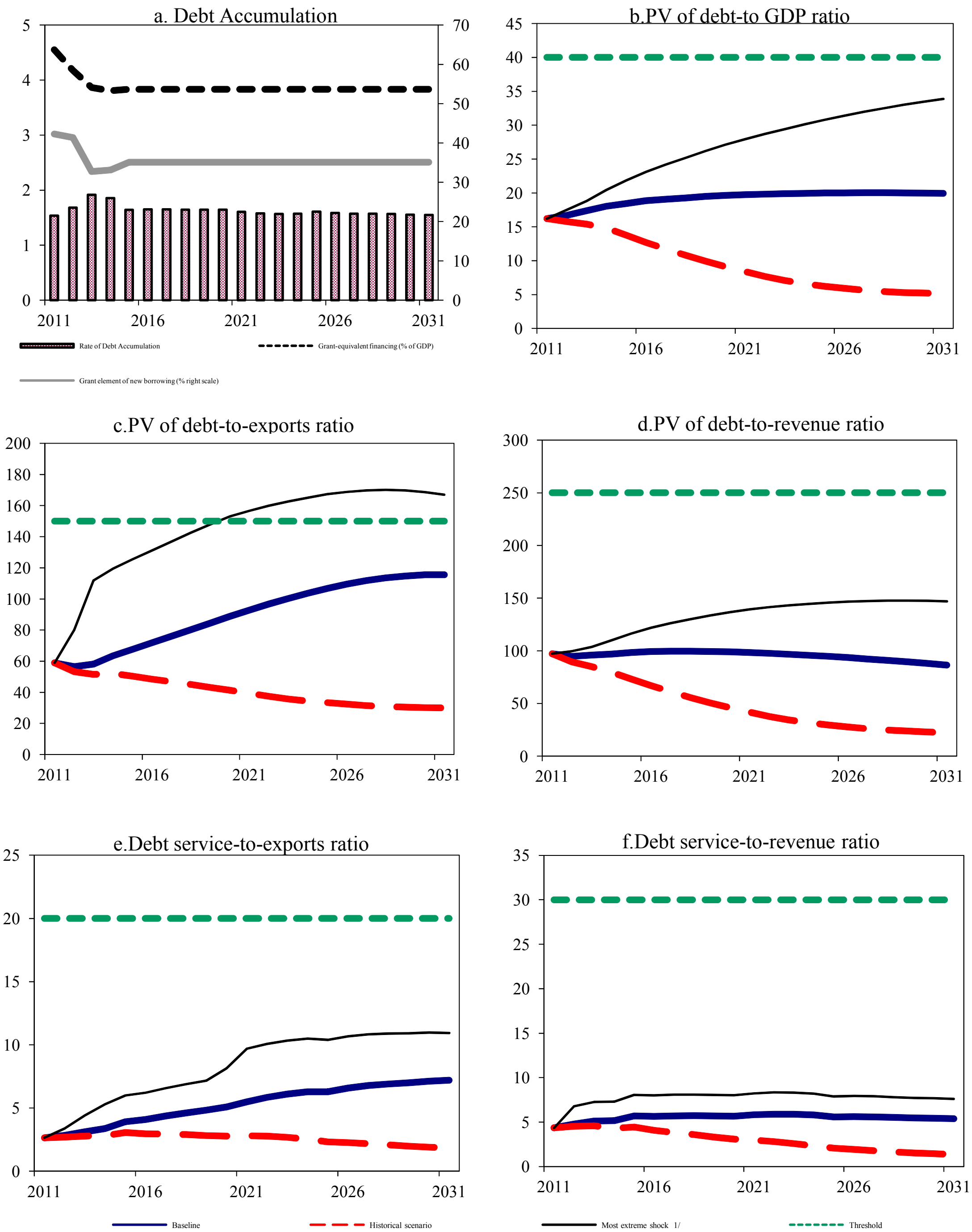
10. **The authorities broadly concurred with the results of the DSA analysis, while emphasizing risks**. They noted that the completion of projects that are at various stages of development for mining diversification (cement, phosphate, uranium, bauxite, iron ore, copper, nickel, oil …) could lead to higher non-gold exports over the medium-term. At the same time, they also expressed concern that grants could turn out less favorable over the medium-term in case of a protracted slowdown in the economies of their traditional development partners.

IV. Debt Distress Classification and Conclusions

11. **The DSA indicates that Mali remains at moderate risk of debt distress based on the external debt burden indicators.** As in last year's DSA, none of the debt burden thresholds are breached over the 20-year projection period under the baseline scenario, and debt sustainability remains mostly sensitive to an export shock and to a hardening of financing terms. Given Mali's low level of external debt after enhanced HIPC and MDRI debt relief, there is scope for non-concessional borrowing of about $100 million (1 percent of GDP) for a period of three years (2012-14) tied to investment in infrastructure projects with a high rate of return for which no concessional financing is available. But given the expected decline in gold exports in the medium term and the uncertain prospects for export diversification, Mali's debt sustainability needs to remain under close scrutiny. Therefore, the government should continue to limit most of its external borrowing to grants and concessional loans.

[1] IMF Country Report No.11/37, Mali - Fifth Review Under the Three-Year Arrangement Under the Extended Credit Facility - Staff Report; Joint IMF/IDA Debt Sustainability Analysis.

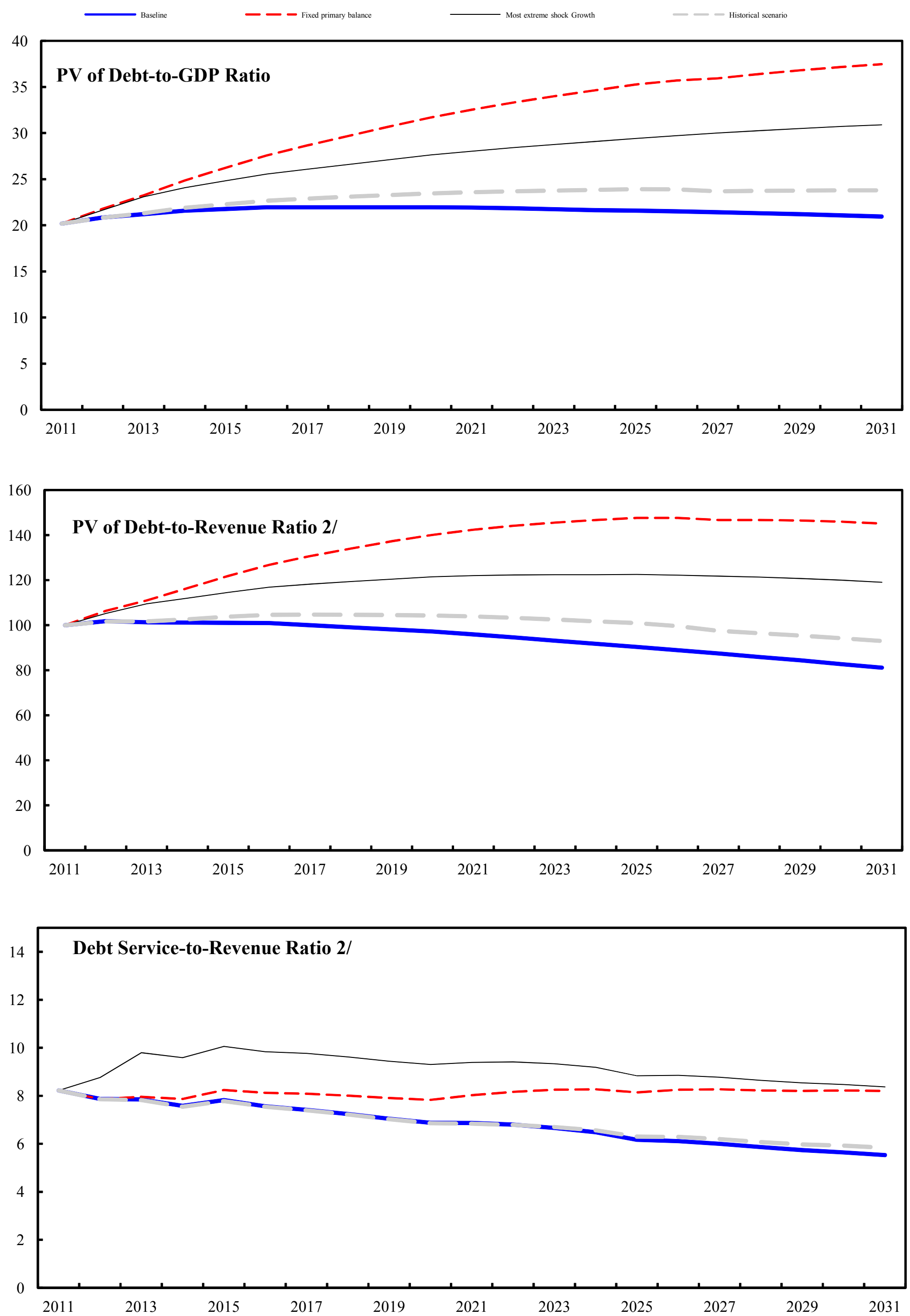
Figure 1.Mali: Indicators of Public Debt Under Alternative Scenarios, 2011-2031 1/



Sources: Country authorities; and staff estimates and projections.

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

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



Sources: Country authorities; and staff estimates and projections.

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

2/ Revenues are defined inclusive of grants.

Table 1a.: External Debt Sustainability Framework, Baseline Scenario, 2008-2031 1/
(In percent of GDP, unless otherwise indicated)

	Actual			Historical Average 6/	Standard Deviation 6/	Projections									
	2008	2009	2010			2011	2012	2013	2014	2015	2016	2011-2016 Average	2021	2031	2017-2031 Average
External debt (nominal) 1/	**20.7**	**22.6**	**24.4**			**22.7**	**23.7**	**24.6**	**25.5**	**26.2**	**26.8**		**28.5**	**29.3**	
o/w public and publicly guaranteed (PPG)	20.7	22.6	24.4			22.7	23.7	24.6	25.5	26.2	26.8		28.5	29.3	
Change in external debt	1.4	1.8	1.8			-1.7	1.0	0.9	0.9	0.7	0.6		0.2	0.0	
Identified net debt-creating flows	3.7	-4.9	2.8			2.2	0.6	0.7	1.0	1.5	1.6		1.7	1.2	
Non-interest current account deficit	**9.1**	**3.6**	**5.6**	**4.2**	**3.1**	**4.7**	**3.1**	**3.2**	**3.5**	**4.0**	**4.1**		**4.3**	**4.0**	4.2
Deficit in balance of goods and services	13.8	7.6	8.6			7.5	4.6	4.4	4.9	5.2	5.5		6.8	7.3	
Exports	29.2	23.7	24.9			27.5	29.6	29.9	28.4	27.3	26.2		21.3	17.2	
Imports	43.0	31.4	33.5			35.0	34.2	34.3	33.3	32.5	31.7		28.0	24.6	
Net current transfers (negative = inflow)	-5.2	-5.4	-4.9	-4.8	0.5	-4.4	-4.3	-4.0	-3.8	-3.7	-3.5		-2.9	-1.9	-2.6
o/w official	-1.2	-1.9	-1.7			-1.5	-1.3	-1.3	-1.2	-1.2	-1.2		-1.2	-1.2	
Other current account flows (negative = net inflow)	0.5	1.4	1.9			1.6	2.7	2.9	2.5	2.5	2.1		0.4	-1.5	
Net FDI (negative = inflow)	**-2.1**	**-8.4**	**-2.0**	**-2.9**	**2.0**	**-1.6**	**-1.6**	**-1.6**	**-1.6**	**-1.6**	**-1.6**		**-1.6**	**-1.6**	-1.6
Endogenous debt dynamics 2/	**-3.3**	**-0.2**	**-0.9**			**-0.9**	**-0.9**	**-0.9**	**-0.8**	**-0.9**	**-0.9**		**-0.9**	**-1.1**	
Contribution from nominal interest rate	0.3	0.3	0.1			0.2	0.3	0.3	0.3	0.3	0.4		0.4	0.4	
Contribution from real GDP growth	-0.8	-0.9	-1.3			-1.1	-1.2	-1.2	-1.2	-1.2	-1.2		-1.3	-1.5	
Contribution from price and exchange rate changes	-2.8	0.4	0.2			…	…	…	…	…	…		…	…	
Residual (3-4) 3/	**-2.4**	**6.8**	**-1.0**			**-3.9**	**0.4**	**0.3**	**-0.1**	**-0.8**	**-1.0**		**-1.5**	**-1.3**	
o/w exceptional financing	-0.6	-0.3	-0.3			-0.3	-0.2	0.0	0.0	0.0	0.0		0.0	0.0	
PV of external debt 4/	...	...	17.6			16.2	16.7	17.4	18.0	18.4	18.8		19.8	19.9	
In percent of exports	...	...	70.6			59.0	56.4	58.1	63.4	67.7	71.9		92.9	115.6	
PV of PPG external debt	**...**	**...**	**17.6**			**16.2**	**16.7**	**17.4**	**18.0**	**18.4**	**18.8**		**19.8**	**19.9**	
In percent of exports	**...**	**...**	**70.6**			**59.0**	**56.4**	**58.1**	**63.4**	**67.7**	**71.9**		**92.9**	**115.6**	
In percent of government revenues	**...**	**...**	**101.4**			**97.3**	**94.9**	**95.9**	**97.0**	**98.4**	**99.4**		**98.5**	**86.5**	
Debt service-to-exports ratio (in percent)	**3.4**	**2.7**	**2.3**			**2.6**	**2.8**	**3.1**	**3.4**	**3.9**	**4.1**		**5.5**	**7.2**	
PPG debt service-to-exports ratio (in percent)	**3.4**	**2.7**	**2.3**			**2.6**	**2.8**	**3.1**	**3.4**	**3.9**	**4.1**		**5.5**	**7.2**	
PPG debt service-to-revenue ratio (in percent)	**6.4**	**3.8**	**3.3**			**4.4**	**4.8**	**5.1**	**5.2**	**5.7**	**5.7**		**5.8**	**5.4**	
Total gross financing need (Billions of U.S. dollars)	0.7	-0.4	0.4			0.4	0.3	0.3	0.4	0.5	0.6		0.9	1.7	
Non-interest current account deficit that stabilizes debt ratio	7.7	1.8	3.8			6.4	2.1	2.3	2.6	3.3	3.5		4.1	4.0	
Key macroeconomic assumptions															
Real GDP growth (in percent)	5.0	4.5	5.8	5.0	2.6	5.4	5.6	5.4	5.1	5.1	5.1	5.3	5.1	5.4	5.2
GDP deflator in US dollar terms (change in percent)	16.9	-2.0	-1.0	7.7	8.5	10.9	2.4	1.6	1.5	1.5	1.5	3.2	2.3	2.5	2.3
Effective interest rate (percent) 5/	1.9	1.6	0.7	1.3	0.4	1.2	1.3	1.3	1.4	1.5	1.5	1.4	1.5	1.5	1.5
Growth of exports of G&S (US dollar terms, in percent)	34.8	-16.8	9.8	14.9	16.9	29.1	16.3	8.3	1.5	2.3	2.6	10.0	3.4	7.6	4.8
Growth of imports of G&S (US dollar terms, in percent)	48.4	-25.3	12.0	14.8	20.7	21.9	5.8	7.3	3.7	3.9	4.2	7.8	5.0	7.8	5.9
Grant element of new public sector borrowing (in percent)	...	...	...	...	...	42.3	41.4	32.7	33.2	35.1	35.1	36.6	35.1	35.1	35.1
Government revenues (excluding grants, in percent of GDP)	15.5	17.1	17.3			16.7	17.6	18.1	18.6	18.7	19.0		20.1	23.0	20.9
Aid flows (in Billions of US dollars) 7/	0.5	0.8	0.6			0.7	0.7	0.8	0.8	0.8	0.9		1.3	2.8	
o/w Grants	0.3	0.4	0.3			0.4	0.3	0.4	0.4	0.4	0.4		0.6	1.3	
o/w Concessional loans	0.2	0.4	0.3			0.4	0.4	0.4	0.4	0.4	0.5		0.7	1.4	
Grant-equivalent financing (in percent of GDP) 8/	...	...	...			4.6	4.2	3.9	3.8	3.8	3.8		3.8	3.8	3.8
Grant-equivalent financing (in percent of external financing) 8/	...	...	...			76.0	69.9	64.7	64.9	66.5	66.5		66.5	66.5	66.5
Memorandum items:															
Nominal GDP (Billions of US dollars)	8.8	9.0	9.4			11.0	11.9	12.7	13.6	14.5	15.5		22.2	47.1	
Nominal dollar GDP growth	22.7	2.4	4.8			16.8	8.1	7.1	6.7	6.6	6.7	8.7	7.6	8.0	7.7
PV of PPG external debt (in Billions of US dollars)			1.6			1.8	2.0	2.2	2.4	2.7	2.9		4.4	9.4	
(PVt-PVt-1)/GDPt-1 (in percent)						1.5	1.7	1.9	1.9	1.6	1.6	1.7	1.6	1.5	1.6
Gross workers' remittances (Billions of US dollars)	0.4	0.5	0.4			0.5	0.5	0.5	0.6	0.6	0.6		0.7	1.0	
PV of PPG external debt (in percent of GDP + remittances)	...	...	16.8			15.5	16.0	16.7	17.3	17.7	18.1		19.2	19.5	
PV of PPG external debt (in percent of exports + remittances)	...	...	59.4			50.8	49.1	50.9	55.4	59.1	62.8		80.9	102.8	
Debt service of PPG external debt (in percent of exports + remittances)	...	...	2.0			2.3	2.5	2.7	2.9	3.4	3.6		4.8	6.4	

Sources: Country authorities; and staff estimates and projections.

1/ Includes both public and private sector external debt.
2/ Derived as [r - g - ρ(1+g)]/(1+g+ρ+gρ) times previous period debt ratio, with r = nominal interest rate; g = real GDP growth rate, and ρ = growth rate of GDP deflator in U.S. dollar terms.
3/ Includes exceptional financing (i.e., changes in arrears and debt relief); 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 1b.Mali: Sensitivity Analysis for Key Indicators of Public and Publicly Guaranteed External Debt, 2011-2031
(In percent)

	Projections							
	2011	2012	2013	2014	2015	2016	**2021**	2031
PV of debt-to GDP ratio								
Baseline	16	17	17	18	18	19	**20**	20
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2011-2031 1/	16	16	15	15	14	13	**8**	5
A2. New public sector loans on less favorable terms in 2011-2031 2	16	18	19	20	22	23	**28**	34
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2012-2013	16	17	18	19	19	20	**21**	21
B2. Export value growth at historical average minus one standard deviation in 2012-2013 3/	16	20	26	26	26	26	**25**	22
B3. US dollar GDP deflator at historical average minus one standard deviation in 2012-2013	16	17	18	19	19	20	**21**	21
B4. Net non-debt creating flows at historical average minus one standard deviation in 2012-2013 4/	16	17	18	19	19	20	**20**	20
B5. Combination of B1-B4 using one-half standard deviation shocks	16	18	20	21	21	21	**22**	20
B6. One-time 30 percent nominal depreciation relative to the baseline in 2012 5/	16	24	24	25	26	27	**28**	28
PV of debt-to-exports ratio								
Baseline	59	56	58	63	68	72	**93**	116
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2011-2031 1/	59	53	52	52	50	48	**39**	30
A2. New public sector loans on less favorable terms in 2011-2031 2	59	59	63	72	80	88	**131**	196
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2012-2013	59	56	58	63	67	72	**93**	115
B2. Export value growth at historical average minus one standard deviation in 2012-2013 3/	59	80	112	119	125	131	**157**	167
B3. US dollar GDP deflator at historical average minus one standard deviation in 2012-2013	59	56	58	63	67	72	**93**	115
B4. Net non-debt creating flows at historical average minus one standard deviation in 2012-2013 4/	59	58	61	66	70	75	**95**	116
B5. Combination of B1-B4 using one-half standard deviation shocks	59	67	75	81	86	91	**113**	133
B6. One-time 30 percent nominal depreciation relative to the baseline in 2012 5/	59	56	58	63	67	72	**93**	115
PV of debt-to-revenue ratio								
Baseline	97	95	96	97	98	99	**98**	87
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2011-2031 1/	97	90	85	80	73	67	**42**	22
A2. New public sector loans on less favorable terms in 2011-2031 2	97	100	104	110	116	122	**139**	147
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2012-2013	97	97	100	101	103	104	**103**	90
B2. Export value growth at historical average minus one standard deviation in 2012-2013 3/	97	113	141	139	139	138	**127**	95
B3. US dollar GDP deflator at historical average minus one standard deviation in 2012-2013	97	98	101	102	104	105	**104**	91
B4. Net non-debt creating flows at historical average minus one standard deviation in 2012-2013 4/	97	98	100	101	102	103	**101**	87
B5. Combination of B1-B4 using one-half standard deviation shocks	97	103	111	111	112	112	**107**	89
B6. One-time 30 percent nominal depreciation relative to the baseline in 2012 5/	97	134	135	137	139	140	**139**	122

Table 1b.Mali: Sensitivity Analysis for Key Indicators of Public and Publicly Guaranteed External Debt, 2011-2031 (continued)

(In percent)

Debt service-to-exports ratio

Baseline	3	3	3	3	4	4	**5**	7
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2011-2031 1/	3	3	3	3	3	3	**3**	2
A2. New public sector loans on less favorable terms in 2011-2031 2	3	3	3	3	4	4	**7**	11
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2012-2013	3	3	3	3	4	4	**5**	7
B2. Export value growth at historical average minus one standard deviation in 2012-2013 3/	3	3	4	5	6	6	**10**	11
B3. US dollar GDP deflator at historical average minus one standard deviation in 2012-2013	3	3	3	3	4	4	**5**	7
B4. Net non-debt creating flows at historical average minus one standard deviation in 2012-2013 4/	3	3	3	3	4	4	**6**	7
B5. Combination of B1-B4 using one-half standard deviation shocks	3	3	4	4	5	5	**7**	8
B6. One-time 30 percent nominal depreciation relative to the baseline in 2012 5/	3	3	3	3	4	4	**5**	7

Debt service-to-revenue ratio

Baseline	4	5	5	5	6	6	**6**	5
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2011-2031 1/	4	5	5	4	4	4	**3**	1
A2. New public sector loans on less favorable terms in 2011-2031 2	4	5	5	5	6	6	**7**	8
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2012-2013	4	5	5	5	6	6	**6**	6
B2. Export value growth at historical average minus one standard deviation in 2012-2013 3/	4	5	6	6	7	7	**8**	6
B3. US dollar GDP deflator at historical average minus one standard deviation in 2012-2013	4	5	5	5	6	6	**6**	6
B4. Net non-debt creating flows at historical average minus one standard deviation in 2012-2013 4/	4	5	5	5	6	6	**6**	5
B5. Combination of B1-B4 using one-half standard deviation shocks	4	5	5	5	6	6	**6**	6
B6. One-time 30 percent nominal depreciation relative to the baseline in 2012 5/	4	7	7	7	8	8	**8**	8
Memorandum item:								
Grant element assumed on residual financing (i.e., financing required above baseline) 6/	29	29	29	29	29	29	**29**	29

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, 2008-2031
(In percent of GDP, unless otherwise indicated)

	Actual			Average 5/	Standard Deviation 5/	Estimate	Projections								
	2008	2009	2010			2011	2012	2013	2014	2015	2016	2011-16 Average	2021	2031	2017-31 Average
Public sector debt 1/	22.6	24.7	28.7			26.6	27.8	28.4	29.1	29.5	29.9		30.6	30.3	
o/w foreign-currency denominated	20.7	22.6	24.4			22.7	23.7	24.6	25.5	26.2	26.8		28.5	29.3	
Change in public sector debt	0.9	2.1	4.0			-2.1	1.2	0.6	0.6	0.4	0.4		0.1	-0.1	
Identified debt-creating flows	-1.9	-4.4	1.9			-1.1	0.3	0.3	0.1	0.1	0.0		-0.3	-0.4	
Primary deficit	1.9	3.9	2.4	2.4	0.9	3.7	2.4	2.1	1.9	1.9	1.9	2.3	1.9	1.9	1.9
Revenue and grants	19.0	21.7	20.2			20.2	20.5	21.0	21.4	21.5	21.7		22.8	25.8	
of which: grants	3.4	4.6	2.9			3.5	2.9	2.8	2.8	2.8	2.8		2.8	2.8	
Primary (noninterest) expenditure	20.8	25.6	22.6			23.9	22.8	23.1	23.2	23.4	23.6		24.7	27.8	
Automatic debt dynamics	-1.1	-2.6	0.2			-3.6	-1.3	-1.4	-1.3	-1.3	-1.3		-1.6	-1.8	
Contribution from interest rate/growth differential	-1.2	-0.8	-1.3			-1.4	-1.3	-1.3	-1.3	-1.4	-2.1		-1.5	-1.1	
of which: contribution from average real interest rate	-0.2	0.1	0.0			0.0	0.1	0.1	0.1	0.0	-0.6		0.0	0.5	
of which: contribution from real GDP growth	-1.0	-1.0	-1.4			-1.5	-1.4	-1.4	-1.4	-1.4	-1.4		-1.5	-1.6	
Contribution from real exchange rate depreciation	0.1	-1.8	1.5			-2.2	0.0	0.0	0.0	0.1	0.7		...	...	
Other identified debt-creating flows	-2.7	-5.6	-0.7			-1.2	-0.7	-0.5	-0.5	-0.5	-0.5		-0.5	-0.5	
Privatization receipts (negative)	-1.0	-4.3	0.0			-0.1	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)	-1.7	-1.4	-0.7			-1.2	-0.7	-0.5	-0.5	-0.5	-0.5		-0.5	-0.5	
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	2.9	6.5	2.2			-1.0	0.9	0.3	0.6	0.4	0.4		0.3	0.2	
Other Sustainability Indicators															
PV of public sector debt	...	...	21.9			20.2	20.8	21.2	21.6	21.8	21.9		21.9	20.9	
o/w foreign-currency denominated	...	...	17.6			16.2	16.7	17.4	18.0	18.4	18.8		19.8	19.9	
o/w external	...	...	17.6			16.2	16.7	17.4	18.0	18.4	18.8		19.8	19.9	
PV of contingent liabilities (not included in public sector debt)	...	...	...			...	...	...	...	...	...		...	...	
Gross financing need 2/	2.9	5.2	4.2			6.4	4.9	4.7	4.3	4.3	4.2		3.9	3.6	
PV of public sector debt-to-revenue and grants ratio (in percent)	…	…	108.6			100.0	101.7	101.3	101.1	101.1	100.9		95.9	81.1	
PV of public sector debt-to-revenue ratio (in percent)	…	…	126.7			121.0	118.6	117.1	116.3	116.1	115.8		109.3	90.9	
o/w external 3/	…	…	101.4			97.3	94.9	95.9	97.0	98.4	99.4		98.5	86.5	
Debt service-to-revenue and grants ratio (in percent) 4/	5.5	3.4	5.6			8.2	7.9	7.8	7.6	7.8	7.6		6.9	5.5	
Debt service-to-revenue ratio (in percent) 4/	6.7	4.3	6.6			9.9	9.2	9.1	8.7	9.0	8.7		7.8	6.2	
Primary deficit that stabilizes the debt-to-GDP ratio	1.0	1.8	-1.6			5.8	1.2	1.5	1.2	1.4	1.4		1.8	2.1	
Key macroeconomic and fiscal assumptions															
Real GDP growth (in percent)	5.0	4.5	5.8	5.7	2.6	5.4	5.6	5.4	5.1	5.1	5.1	5.3	5.1	5.4	5.2
Average nominal interest rate on forex debt (in percent)	1.9	1.6	0.7	1.3	0.4	1.2	1.3	1.3	1.4	1.5	1.5	1.4	1.5	1.5	1.5
Average real interest rate on domestic debt (in percent)	-6.3	0.9	2.7	0.5	3.7	1.2	4.2	3.5	3.5	3.6	3.6	3.3	3.6	3.4	3.6
Real exchange rate depreciation (in percent, + indicates depreciation)	0.5	-9.1	7.1	-4.6	9.3	-9.5	...	...	...	...	...	...	...	...	...
Inflation rate (GDP deflator, in percent)	8.8	3.6	4.0	3.6	3.1	4.1	2.5	2.4	2.4	2.3	2.3	2.7	2.3	2.5	2.3
Growth of real primary spending (deflated by GDP deflator, in percent)	-0.1	0.3	-0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Grant element of new external borrowing (in percent)	...	...	...	…	…	42.3	41.4	32.7	33.2	35.1	35.1	36.6	35.1	35.1	...

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 for Key Indicators of Public Debt 2011-2031

	Projections							
	2011	2012	2013	2014	2015	2016	2021	2031
PV of Debt-to-GDP Ratio								
Baseline	20	21	21	22	22	22	22	21
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	20	21	21	22	22	23	24	24
A2. Primary balance is unchanged from 2011	20	22	23	25	26	28	33	37
A3. Permanently lower GDP growth 1/	20	21	22	22	23	24	27	37
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2012-2013	20	22	23	24	25	26	28	31
B2. Primary balance is at historical average minus one standard deviations in 2012-2013	20	21	23	23	23	23	23	22
B3. Combination of B1-B2 using one half standard deviation shocks	20	21	22	23	23	24	25	26
B4. One-time 30 percent real depreciation in 2012	20	27	27	27	26	26	24	20
B5. 10 percent of GDP increase in other debt-creating flows in 2012	20	28	28	28	28	28	27	24
PV of Debt-to-Revenue Ratio 2/								
Baseline	100	102	101	101	101	101	96	81
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	100	102	102	103	104	105	104	93
A2. Primary balance is unchanged from 2011	100	106	111	116	122	127	142	145
A3. Permanently lower GDP growth 1/	100	103	103	104	106	108	117	142
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2012-2013	100	105	110	112	115	117	122	119
B2. Primary balance is at historical average minus one standard deviations in 2012-2013	100	105	108	107	107	107	100	83
B3. Combination of B1-B2 using one half standard deviation shocks	100	104	106	107	109	109	109	99
B4. One-time 30 percent real depreciation in 2012	100	132	128	124	122	119	103	79
B5. 10 percent of GDP increase in other debt-creating flows in 2012	100	136	134	132	130	129	118	92
Debt Service-to-Revenue Ratio 2/								
Baseline	8	8	8	8	8	8	7	6
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	8	8	8	8	8	8	7	6
A2. Primary balance is unchanged from 2011	8	8	8	8	8	8	8	8
A3. Permanently lower GDP growth 1/	8	8	8	8	8	8	8	8
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2012-2013	8	8	8	8	8	8	8	7
B2. Primary balance is at historical average minus one standard deviations in 2012-2013	8	8	8	8	8	8	7	6
B3. Combination of B1-B2 using one half standard deviation shocks	8	8	8	8	8	8	7	6
B4. One-time 30 percent real depreciation in 2012	8	9	10	10	10	10	9	8
B5. 10 percent of GDP increase in other debt-creating flows in 2012	8	8	9	9	9	8	8	6

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.