INTERNATIONAL MONETARY FUND

AND

INTERNATIONAL DEVELOPMENT ASSOCIATION

MALI

Joint IMF/IDA Debt Sustainability Analysis

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The 2008 debt sustainability analysis (DSA) indicates that Mali is at a low risk of debt distress. The outlook remained broadly stable since the previous DSA, completed in October 2007. Further fiscal consolidation, structural reforms to reduce vulnerability to shocks, and strengthened debt management would help Mali further reduce its risk of debt distress.

I. BACKGROUND AND MACROECONOMIC ASSUMPTIONS

1. **As a result of the HIPC and MDRI initiatives, Mali's stock of external debt has declined significantly.**[2] Mali's stock of public and publicly guaranteed external debt has declined from 49.3 percent of GDP in 2005 to 20 percent in 2006; at end-2007 it increased slightly to 22.9 percent of GDP[3]. Total public debt at end-2007 was estimated at US$1,542 million (i.e., 24 percent of GDP, of which 1.1 percent was domestic debt).

2. **The baseline scenario reflects prudent macroeconomic projections and is in line with Mali's historical experience (Box 1**). The medium-term outlook envisages continued macroeconomic stability and sustained economic growth, supported by continued structural reforms, highly concessional borrowing, and a moderate scaling up of aid. Exports are projected to drive growth over the medium term based on an increase in gold production

[1] Prepared jointly by IMF and World Bank staff. ADB staff was consulted during the preparation process.

[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 ongoing.

[3] This reflects new concessional loans from IDA and the ADB, and a non-concessional loan from IsDB.

spurred by the high international gold prices. In the long term, however, gold production is projected to taper off, resulting in slightly lower growth of GDP and exports, and slowing the improvement in the current account deficit. The fiscal deficit (including grants), upon which net public borrowing depends, is projected to hover around 4 percent of GDP throughout the DSA period.

Box 1. Mali: Debt Sustainability Analysis: Macroeconomic Assumptions, 2008-26

- Real GDP growth is projected to average 4.9 percent a year during 2008-13 and remain around 5 percent a year thereafter, assuming lower gold production from 2012 onward and rainfall returning to its long-term average level.[4]
- Consumer price inflation is projected to remain at about 2.5 percent a year, in line with the WAEMU convergence criterion.
- The basic fiscal balance is projected to improve from an average deficit of 0.4 percent of GDP in the period 2008 to 2013, to a surplus of 0.2 percent of GDP in the long run; grants are assumed to increase on average by 3 percent per year during 2008-13.
- Exports are projected to grow by 7.3 percent a year during 2008-13, compared to a growth rate of 13 percent during 2002-2007, reflecting slower gold exports. Imports are projected to grow at 6.4 and 7.7 percent in the medium and long term respectively. International reserves are expected to remain high, at about 6 months of imports of goods and services during the projection period.
- The terms of trade and real exchange rate are projected to remain unchanged from 2013 onward. Public sector net external new borrowing is expected to average about 2.3 percent of GDP a year. It is assumed that 70 percent of the new borrowings will come from multilateral sources and the remaining 30 percent from bilateral sources.
- It is assumed that there will be no new public sector domestic medium and long-term (MLT) loans. The current MLT domestic loan stock is assumed to be amortized linearly through the period 2008-2013.

II. Results of the External Debt Sustainability Analysis

3. **Mali's external debt ratios have changed little since the last DSA and have remained well below the indicative thresholds under the baseline scenario.** Although Mali's external debt ratios are projected to increase steadily over time, they are projected to remain below the applicable indicative debt thresholds over the period 2008–26 under the baseline scenario (Figure 1 and Table 1).[5] The NPV of debt-to-GDP is expected to climb

[4] The 2007 PRSP projects an annual economic growth of 7 percent. The teams assumed a more conservative approach, taking into account the current pace of economic reform, assuming that the economy will grow at its historical trend rate of 5 percent per year.

[5] Based on the World Bank classification, 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.

from about 14 percent in 2007 to 31 percent in 2026. As gold production tapers off, NPV of debt-to-exports is projected to increase from 48 percent in 2007 to 106 percent in 2026. The debt service-to-exports ratio is expected to increase from 3 percent in 2007 to 5 percent in 2026.

4. **The standard sensitivity tests reveal some vulnerabilities** (Table 1 and Figure 1). The threshold for the ratio of NPV of debt-to-GDP is breached in the later years of the projection period for the alternative scenario that assumes new public loans on less favorable terms and for the bound test that assumes a 30 percent depreciation relative to the baseline in 2008. However, all debt service ratios remain below the indicative thresholds in all scenarios examined.

5. **Mali remains at low risk of debt distress**. Even though the indicative threshold is breached under two scenarios, there are important factors that mitigate the risks identified by the analysis. Regarding the 30 percent depreciation shock, Mali's real exchange rate has remained broadly stable, and recent econometric studies on Mali's real exchange rate parity are inconclusive. For the WAEMU zone as a whole, the studies indicate that any misalignment is modest, suggesting that a shock of such magnitude would be unlikely. The establishment of mechanisms to ensure closer consultations between the authorities and the IMF and Bank staffs mitigates the risk of less concessional lending. In addition, upcoming Bank-supported technical assistance in debt management will further strengthen debt management structures and analysis.[6] Finally, it should be emphasized that the breaches occur at the end of the projection period – therefore, there is ample time for policy reactions should future DSAs point to a worsening debt situation.

Box 2: Debt Burden Indicators

	Thresholds[1/]	Mali: Baseline Scenario Ratios		
		2007	2008-13[2/]	2014-26[2/]
		(in percent)		
NPV of external debt-to-exports	150	47.9	66.2	97.0
NPV of external debt-to-GDP	40	14.2	20.3	29.3
External debt service-to-exports	20	3.4	3.5	4.0
NPV debt-to revenue 3/	250	77.3	110.1	143.4
Debt service-to revenue 3/	30	11.9	5.5	5.4

1/ Policy indicative thresholds for a medium policy performer.
2/ Simple averages.
3/ Excluding grants.

[6] In the past, Mali has generally contracted concessional loans. In 2007, a non-concessional package was contracted from the IsDB in the amount of US$71 million (about 1 percent of Mali's 2007 GDP). Based on the economic merits of the package, IDA granted a waiver on its non-concessional borrowing policy.

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 4). The NPV-of-debt-to-revenue ratio is projected to increase from 64 percent in 2007 to 135 percent in 2026 (incl. grants).[7] The debt-service-to-revenue (excl. grants) ratio is projected to remain low, declining from 10 percent in 2007 to 4 percent in 2026. Thus, Mali's public debt is considered manageable, as long as the authorities implement a cautious debt strategy.[8]

7. **The sensitivity analysis shows that Mali's public debt is vulnerable to shocks.** If GDP growth were to be permanently lower by 1 percentage point compared to the baseline, adversely affecting revenue collection, and without any offsetting adjustment, the NPV of public debt (incl. grants) would reach 196 percent of revenue by 2026 (Table 2 and Figure 2) compared to 135 percent under the baseline. Similarly, if the projected 2008 primary deficit of 3.5 percent—atypically high for Mali—remained constant throughout the projection period (as opposed to the projected drop to an average of 0.2 percent), the NPV of public debt-to-revenue would climb from 64 percent in 2007 to 192 percent by 2026 (Table 4). The sensitivity analysis underscores the importance of continuing to pursue sound macroeconomic policies to achieve high GDP growth rates and low public sector deficits.

IV. Conclusion

8. **Mali's risk of debt distress is low**. Most debt indicators are below the relevant country-specific debt-burden thresholds. Under two sensitivity tests, the NPV of debt-to-GDP breaches the threshold in the outer years of the projection period, but strong mitigating factors would render these scenarios unlikely. Results of the total public sector debt ratios confirm the results of the external DSA. Going forward, Mali would need to deepen fiscal consolidation, enhance competitiveness, and follow a prudent debt strategy, in order to strengthen its debt sustainability.

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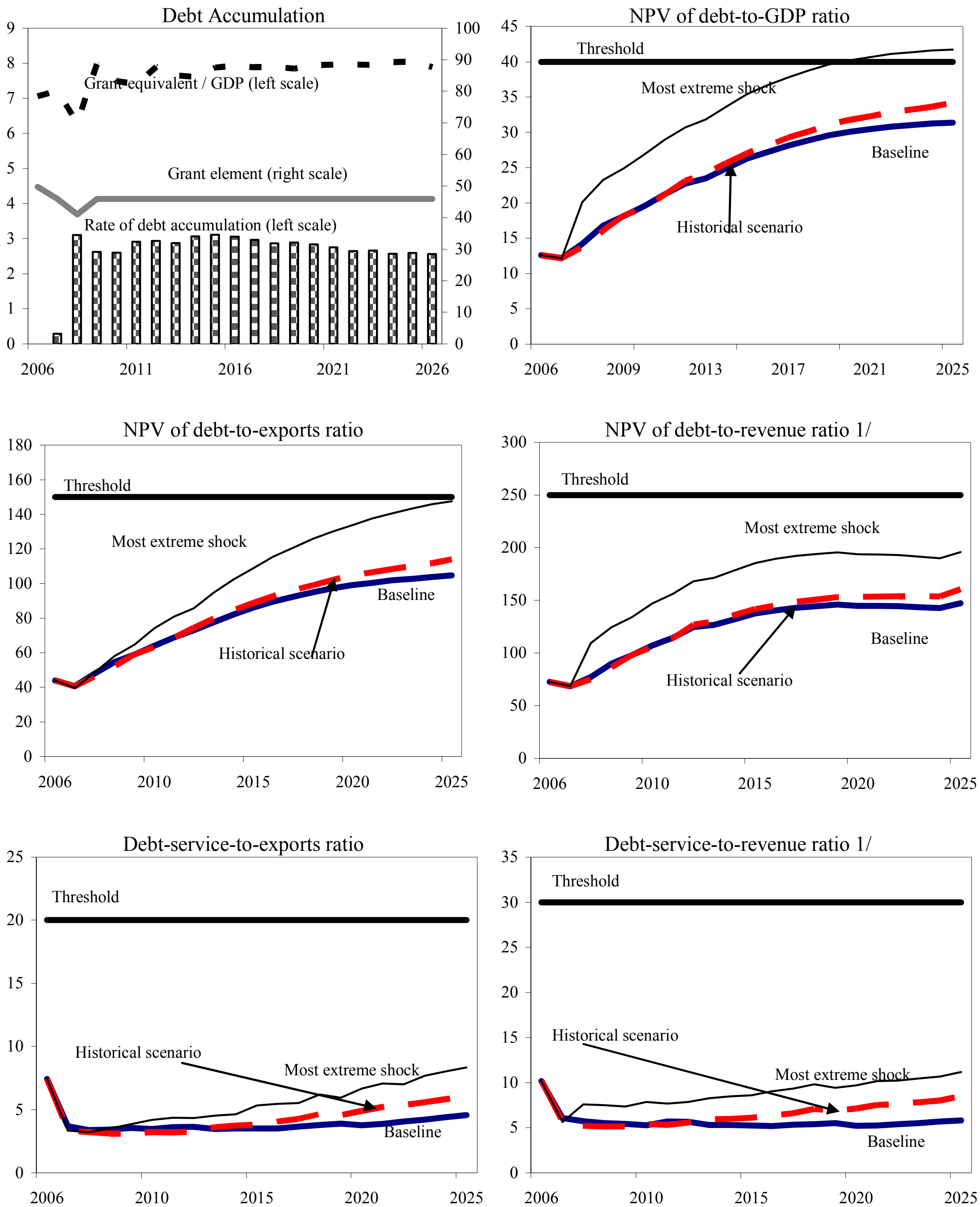
[7] Excluding grants, the NPV-of-debt-to-revenue ratio is projected to increase from 75.8 percent in 2007 to 152 percent in 2026.

[8] Mali's current debt strategy relies on lower cost concessional external financing, thereby reducing the stock of the government's domestic borrowing and promoting the "crowding in" of credit to the private sector.

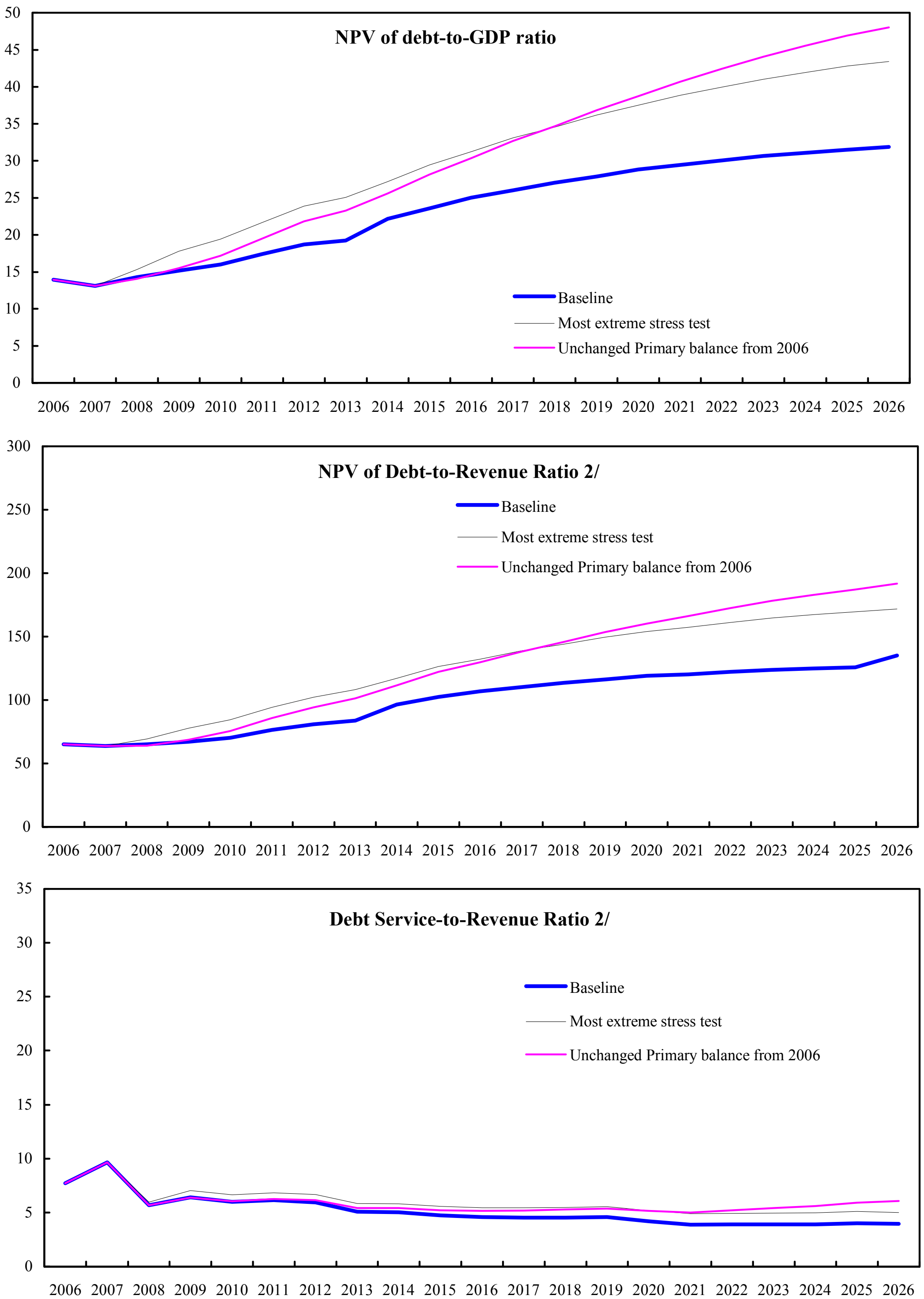
Figure 1. Mali: Indicators of Public and Publicly Guaranteed External Debt
Under Alternative Scenarios, 2006-2026 (in percent)



Source: Staff projections and simulations.

1/ Revenue excludes grants.

Figure 2.Mali: Indicators of Public Debt Under Alternative Scenarios, 2006-2026 1/



Source: Staff projections and simulations.
1/ Most extreme stress test is test that yields highest ratio in 2016.
2/ Revenue including grants.

Table 1. Mali: External Debt Sustainability Framework, Baseline Scenario, 2005-2026 1/
(In percent of GDP, unless otherwise indicated)

	Actual			Historical Average 6/	Standard Deviation 6/							2008-13			2014-26
	2005	2006	2007			2008	2009	2010	2011	2012	2013	Average	2018	2026	Average
External debt (nominal) 1/	49.3	20.0	22.9	58.0	26.3	26.9	29.3	31.0	33.7	36.3	37.1	32.4	46.8	54.6	48.5
o/w public and publicly guaranteed (PPG)	49.3	20.0	22.9	57.7	25.4	26.9	29.3	31.0	33.7	36.3	37.1	32.4	46.8	54.6	48.5
Change in external debt	0.5	-29.3	2.9	-7.7	11.6	4.0	2.4	1.7	2.7	2.6	0.8	2.4	1.3	0.6	1.3
Identified net debt-creating flows	-1.0	0.5	3.7	0.4	8.5	3.5	2.4	3.0	2.5	2.9	2.4	2.8	1.9	1.3	1.8
Non-interest current account deficit	5.7	5.0	5.5	6.3	1.9	5.5	4.5	5.0	5.1	5.1	5.0	5.0	5.0	4.7	5.0
Deficit in balance of goods and services	8.4	6.5	7.0	11.2	8.8	7.2	5.5	5.5	5.5	5.5	5.3	5.7	4.9	4.4	4.8
Exports	28.6	30.0	29.6	27.2	3.2	30.8	30.8	30.5	30.8	31.2	30.2	30.7	30.4	29.5	30.2
Imports	37.0	36.6	36.6	38.3	8.2	38.0	36.3	36.0	36.3	36.6	35.5	36.5	35.3	33.9	35.0
Net current transfers (negative = inflow)	-2.8	-2.6	-1.5	-4.3	1.8	-1.4	-1.4	-1.4	-1.4	-1.3	-1.3	-1.4	-1.2	-0.9	-1.2
o/w official	-1.3	-1.5	-0.4	-2.0	1.7	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4
Other current account flows (negative = net inflow)	0.1	1.1	0.0	-0.5	5.8	-0.3	0.4	0.9	1.0	1.0	1.0	0.7	1.3	1.2	1.4
Net FDI (negative = inflow)	-1.0	-1.3	-1.0	-2.2	2.1	-1.1	-1.1	-1.1	-1.2	-1.2	-1.2	-1.2	-1.3	-1.3	-1.3
Endogenous debt dynamics 2/	-5.7	-3.2	-0.8	-3.7	5.6	-0.9	-1.0	-0.8	-1.4	-1.0	-1.3	-1.1	-1.8	-2.0	-1.8
Contribution from nominal interest rate	0.2	0.5	0.2	0.6	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.5
Contribution from real GDP growth	-2.6	-2.4	-0.5	-2.9	3.6	-1.1	-1.3	-1.1	-1.7	-1.3	-1.7	-1.4	-2.3	-2.5	-2.3
Contribution from price and exchange rate changes	-3.3	-1.3	-0.5	-1.5	4.8	...	...	...	...	...	...	...	...	...	...
Residual (3-4) 3/	1.5	-29.8	-0.7	-8.1	10.9	0.5	0.0	-1.3	0.2	-0.4	-1.7	-0.4	-0.6	-0.7	-0.5
o/w exceptional financing	0.0	0.0	0.0	-0.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NPV of external debt 4/	12.6	12.2	14.2	20.2	8.0	16.8	18.2	19.5	21.2	22.7	23.5	20.3	28.8	31.4	29.3
In percent of exports	44.0	40.6	47.9	77.0	36.0	54.6	59.0	64.1	68.8	73.0	77.7	66.2	95.0	106.5	97.0
NPV of PPG external debt	12.6	12.2	14.2	20.2	8.0	16.8	18.2	19.5	21.2	22.7	23.5	20.3	28.8	31.4	29.3
In percent of exports	44.0	40.6	47.9	77.0	36.0	54.6	59.0	64.1	68.8	73.0	77.7	66.2	95.0	106.5	97.0
In percent of government revenues	72.6	68.6	77.3	116.4	49.0	90.0	97.9	107.1	114.4	124.6	126.7	110.1	144.5	152.8	143.4
Debt service-to-exports ratio (in percent)	7.4	3.7	3.4	7.2	2.9	3.4	3.6	3.5	3.6	3.6	3.5	3.5	3.8	4.7	4.0
PPG debt service-to-exports ratio (in percent)	7.4	3.7	3.4	6.9	2.7	3.4	3.6	3.5	3.6	3.6	3.5	3.5	3.8	4.7	4.0
PPG debt service-to-revenue ratio (in percent)	10.2	6.1	5.7	11.9	5.2	5.5	5.4	5.3	5.7	5.7	5.3	5.5	5.4	6.1	5.4
Total gross financing need (billions of U.S. dollars)	0.4	0.3	0.4	0.3	0.2	0.4	0.3	0.4	0.4	0.5	0.5	0.4	0.7	1.3	0.9
Non-interest current account deficit that stabilizes debt ratio	5.2	34.2	2.6	14.1	12.3	1.5	2.1	3.3	2.3	2.5	4.2	2.7	3.7	4.1	3.7
Key macroeconomic assumptions															
Real GDP growth (in percent)	6.1	5.3	2.8	4.8	4.1	5.4	5.1	4.1	5.9	4.2	5.0	5.0	5.4	5.0	5.2
GDP deflator in US dollar terms (change in percent)	7.3	2.7	2.4	4.3	8.3	2.7	4.9	1.0	2.5	6.0	2.8	3.3	2.3	4.3	2.9
Effective interest rate (percent) 5/	0.5	1.1	1.2	1.0	0.4	1.1	1.1	1.1	1.1	1.0	1.0	1.1	1.1	0.9	1.0
Growth of exports of G&S (US dollar terms, in percent)	32.0	10.9	6.4	12.8	13.0	3.9	8.0	8.2	8.0	8.0	8.0	7.3	8.0	7.0	7.9
Growth of imports of G&S (US dollar terms, in percent)	23.2	4.4	8.2	13.2	21.9	3.8	3.0	8.4	7.8	7.8	7.8	6.4	7.8	7.0	7.7
Grant element of new public sector borrowing (in percent)	45.9	45.9	41.0	44.3	2.9	45.9	45.9	45.9	45.9	45.9	45.9	45.9	45.9	45.9	45.9
Aid flows (in billions of US dollars) 7/	2.0	0.6	0.7	0.8	0.5	0.7	0.7	0.8	0.8	0.9	0.9	0.8	1.3	0.1	1.3
o/w Grants	0.3	0.4	0.3	0.2	0.1	0.4	0.4	0.5	0.5	0.6	0.6	0.5	0.9	1.7	1.2
o/w Concessional loans	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.1	0.2
Grant-equivalent financing (in percent of GDP) 8/	3.1	7.2	6.3	5.5	2.1	8.0	7.5	7.4	7.9	7.7	7.6	7.7	7.8	7.6	7.9
Grant-equivalent financing (in percent of external financing) 8/	61.3	78.1	70.5	70.0	8.4	71.3	74.7	75.1	74.2	74.6	75.3	74.2	75.6	75.6	75.6
Memorandum items:															
Nominal GDP (billions of US dollars)	6.1	6.4	6.9	3.9	1.6	6.9	7.5	8.2	8.7	9.3	10.4	8.5	15.2	28.7	18.6
(NPVt-NPVt-1)/GDPt-1 (in percent)						2.6	2.8	3.2	3.1	3.1	3.4	3.0	3.1	2.8	3.0

Source: Staff simulations.

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. Projections also includes contribution from price and exchange rate changes. The large residual in 2006 is due to MDRI.

4/ Assumes that NPV 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 NPV of new debt).

Table 2.Mali: Public Sector Debt Sustainability Framework, Baseline Scenario, 2005-2026
(In percent of GDP, unless otherwise indicated)

	Actual					Projections									
	2005	2006	2007	Historical Average 5/	Standard Deviation 5/	2008	2009	2010	2011	2012	2013	2008-13 Average	2018	2026	2014-26 Average
Public sector debt 1/	51.3	21.4	24.0	64.0	32.4	27.8	30.1	31.7	34.3	36.8	37.6	33.0	47.3	55.1	49.0
o/w foreign-currency denominated	49.3	20.0	22.9	61.7	32.3	26.9	29.3	31.0	33.7	36.3	37.1	32.4	46.8	54.6	48.5
Change in public sector debt	6.0	-29.9	2.6	-8.7	16.3	3.8	2.3	1.6	2.6	2.5	0.8	2.3	2.3	1.8	2.0
Identified debt-creating flows	5.5	-29.4	1.6	-8.2	17.0	1.6	0.2	-1.0	-0.5	-0.8	-2.6	-0.5	0.2	-2.7	-1.7
Primary deficit	2.6	2.7	3.0	2.2	0.8	3.5	2.1	1.3	1.1	0.9	0.8	1.6	2.1	0.0	0.7
Revenue and grants	22.0	21.4	20.6	20.0	1.3	21.9	22.6	22.8	22.7	23.1	22.9	22.7	22.6	23.6	23.0
of which : grants	4.1	3.7	3.3	4.1	0.6	3.0	3.2	3.1	3.0	3.0	2.8	3.0	3.2	2.6	2.8
Primary (noninterest) expenditure	24.6	24.2	23.6	22.2	1.5	25.4	24.6	24.0	23.8	24.0	23.7	24.3	24.6	23.6	23.8
Automatic debt dynamics	3.3	-6.6	-0.7	-5.1	10.4	-1.4	-1.4	-1.9	-1.5	-1.6	-3.2	-1.8	-1.4	-2.7	-2.3
Contribution from interest rate/growth differential	-3.2	-3.1	-0.6	-4.7	4.3	-1.3	-1.3	-1.2	-1.8	-1.5	-1.9	-1.5	-1.3	-2.6	-1.9
of which : contribution from average real interest rate	-0.6	-0.5	0.0	-0.7	0.5	-0.1	0.1	0.0	0.0	-0.1	-0.2	0.0	0.1	-0.4	-0.2
of which : contribution from real GDP growth	-2.6	-2.6	-0.6	-3.3	4.0	-1.2	-1.4	-1.2	-1.8	-1.4	-1.8	-1.4	-1.4	-2.2	-1.8
Contribution from real exchange rate depreciation	6.5	-3.6	-0.1	-0.5	8.8	-0.1	-0.2	-0.8	0.3	-0.2	-1.3	-0.4	-0.2	-0.1	-0.4
Other identified debt-creating flows	-0.3	-25.5	-0.7	-5.2	10.3	-0.5	-0.4	-0.4	-0.1	-0.1	-0.1	-0.3	-0.4	0.0	-0.1
Privatization receipts (negative)	-0.3	0.0	-0.2	-0.4	0.5	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	0.0	0.0	0.0	0.0
Debt relief (HIPC and other)	0.0	-25.5	-0.5	-4.9	10.2	-0.5	-0.4	-0.4	-0.1	-0.1	-0.1	-0.3	-0.4	0.0	-0.1
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	0.0	0.0	0.0	0.0
Residual, including asset changes	0.5	-0.5	1.0	-0.6	3.7	2.2	2.1	2.6	3.1	3.3	3.3	2.8	2.1	4.5	3.7
NPV of public sector debt	29.7	14.0	13.1	12.5	11.7	14.3	15.2	16.0	17.4	18.7	19.3	16.8	27.0	31.9	28.1
o/w foreign-currency denominated	27.7	12.6	12.1	10.2	11.9	13.3	14.4	15.3	16.8	18.2	18.8	16.1	23.7	28.6	24.7
o/w external	27.7	12.6	12.1	...	...	13.3	14.4	15.3	16.8	18.2	18.8	16.1	23.7	28.6	24.7
NPV of contingent liabilities (not included in public sector debt)	...	0.0	0.0	...	...	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gross financing need 2/	4.8	4.4	5.0	4.8	0.6	5.2	4.0	3.1	3.0	2.8	2.4	3.4	1.6	0.9	1.4
NPV of public sector debt-to-revenue and grants ratio (in percent)	135.3	65.2	63.8	60.0	55.1	65.1	67.3	70.4	76.5	80.9	83.9	74.0	119.9	135.1	122.0
NPV of public sector debt-to-revenue ratio (in percent)	166.0	78.9	75.8	74.2	68.3	75.5	78.3	81.4	88.4	93.0	95.9	85.4	139.4	151.5	139.1
o/w external 3/	...	...	...	...	...	70.6	74.2	77.9	85.4	90.6	93.4	82.0	122.0	135.8	122.3
Debt service-to-revenue and grants ratio (in percent) 4/	9.8	7.7	9.6	12.9	3.1	5.7	6.4	6.0	6.1	5.9	5.1	5.9	4.5	4.0	4.4
Debt service-to-revenue ratio (in percent) 4/	12.0	9.4	11.5	16.4	4.6	6.6	7.5	6.9	7.1	6.8	5.8	6.8	6.8	4.6	5.9
Primary deficit that stabilizes the debt-to-GDP ratio	-3.4	32.7	0.4	8.3	16.5	-0.4	-0.2	-0.3	-1.5	-1.6	0.0	-0.7	-0.2	-1.8	-1.2
Key macroeconomic and fiscal assumptions															
Real GDP growth (in percent)	6.1	5.2	2.8	4.8	4.1	5.4	5.1	4.1	5.9	4.2	5.0	5.0	5.4	5.0	5.2
Average nominal interest rate on forex debt (in percent)	1.2	0.5	1.5	1.0	0.4	1.4	1.3	1.3	1.2	1.2	1.2	1.3	1.2	1.0	1.2
Average nominal interest rate on domestic debt (in percent)	3.8	14.6	10.2	4.5	5.1	7.4	33.0	34.2	34.8	35.3	33.9	29.8	-8.0	-68.1	-27.4
Average real interest rate (in percent)	-1.4	-1.0	0.1	-0.9	0.5	-1.0	0.1	-0.3	0.3	0.0	0.0	-0.1	-0.9	-1.5	-1.0
Real discount rate on foreign-currency debt (in percent)	1.9	2.9	2.9	2.9	0.6	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9
Average real interest rate on domestic currency debt (in percent)	7.6	9.0	7.9	1.4	6.2	5.4	30.0	28.7	34.5	32.0	26.3	26.2	-10.5	-69.2	-29.3
Real exchange rate depreciation (in percent, + indicates depreciation)	16.1	-7.8	-0.7	-1.3	12.2	-0.4	-0.7	-2.7	1.0	-0.5	-3.8	...	...	...	...
Inflation rate (GDP deflator, in percent)	-3.6	5.1	2.1	2.6	3.6	1.9	2.3	4.2	0.2	2.5	6.0	2.9	2.7	3.5	2.8
Growth of real primary spending (deflated by GDP deflator, in percent)	19.3	3.4	0.6	6.7	8.1	13.2	2.0	1.6	5.0	5.2	3.5	5.1	5.6	5.3	5.5
Grant element of new external borrowing (in percent)	49.7	49.7	45.9	49.3	1.3	45.9	45.9	45.9	45.9	45.9	45.9	45.9	45.9	45.9	45.9

Sources: Country authorities; and Fund staff estimates and projections.
1/ Comprises central government and publicly guaranteed debt.
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 3. Mali: Sensitivity Analyses for Key Indicators of Public and Publicly Guaranteed External Debt, 2007-26
(In percent)

	Projections						
	2007	2008	2009	2010	2011	2016	2026
NPV of debt-to-GDP ratio							
Baseline	14	17	18	20	21	27	31
A. Alternative Scenarios							
A1. Key variables at their historical averages in 2008-27 1/	14	16	18	19	21	28	35
A2. New public sector loans on less favorable terms in 2008-27 2/	14	18	20	23	25	35	42
B. Bound Tests							
B1. Real GDP growth at historical average minus one standard deviation in 2008-09	14	17	19	20	22	27	31
B2. Export value growth at historical average minus one standard deviation in 2008-09 3/	15	20	21	22	24	30	32
B3. US dollar GDP deflator at historical average minus one standard deviation in 2008-09	16	20	21	23	25	31	35
B4. Net non-debt creating flows at historical average minus one standard deviation in 2008-09 4/	14	16	17	18	20	25	29
B5. Combination of B1-B4 using one-half standard deviation shocks	13	14	16	17	19	26	32
B6. One-time 30 percent nominal depreciation relative to the baseline in 2008 5/	20	23	25	27	29	37	42
NPV of debt-to-exports ratio							
Baseline	48	55	59	64	69	90	106
A. Alternative Scenarios							
A1. Key variables at their historical averages in 2007-26 1/	46	52	59	63	69	93	118
A2. New public sector loans on less favorable terms in 2007-26 2/	49	58	65	74	81	116	142
B. Bound Tests							
B1. Real GDP growth at historical average minus one standard deviation in 2008-09	48	58	63	66	72	92	110
B2. Export value growth at historical average minus one standard deviation in 2008-09 3/	52	75	81	85	91	114	131
B3. US dollar GDP deflator at historical average minus one standard deviation in 2008-09	48	58	63	66	72	92	110
B4. Net non-debt creating flows at historical average minus one standard deviation in 2008-09 4/	47	55	60	64	69	90	109
B5. Combination of B1-B4 using one-half standard deviation shocks	41	43	49	52	58	79	101
B6. One-time 30 percent nominal depreciation relative to the baseline in 2008 5/	48	58	63	66	72	92	110
Debt service-to-exports ratio							
Baseline	3	3	4	3	4	4	5
A. Alternative Scenarios							
A1. Key variables at their historical averages in 2008-27 1/	3	3	3	3	3	4	6
A2. New public sector loans on less favorable terms in 2008-27 2/	3	4	4	4	4	5	9
B. Bound Tests							
B1. Real GDP growth at historical average minus one standard deviation in 2008-09	3	3	3	4	4	4	6
B2. Export value growth at historical average minus one standard deviation in 2008-09 3/	3	4	4	4	4	5	7
B3. US dollar GDP deflator at historical average minus one standard deviation in 2008-09	3	3	3	4	4	4	6
B4. Net non-debt creating flows at historical average minus one standard deviation in 2008-09 4/	3	3	3	3	3	4	6
B5. Combination of B1-B4 using one-half standard deviation shocks	3	3	3	3	3	4	6
B6. One-time 30 percent nominal depreciation relative to the baseline in 2008 5/	3	3	3	4	4	4	6
Memorandum item:							
Grant element assumed on residual financing (i.e., financing required above baseline) 6/	47	47	47	47	47	47	47

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 assum 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.

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Table 4.Mali: Sensitivity Analysis for Key Indicators of Public Debt 2007-2026

	Projections							
	2007	2008	2009	2010	2011	2012	2016	2026
NPV of Debt-to-GDP Ratio								
Baseline	13	14	15	16	17	19	25	32
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	13	13	14	15	17	19	25	40
A2. Primary balance is unchanged from 2006	13	14	16	17	20	22	30	48
A3. Permanently lower GDP growth 1/	13	14	16	17	19	21	29	50
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2008-2009	13	15	18	19	22	24	31	43
B2. Primary balance is at historical average minus one standard deviations in 2008-2009	13	14	15	16	17	19	23	29
B3. Combination of B1-B2 using one half standard deviation shocks	13	14	15	16	17	19	23	30
B5. 10 percent of GDP increase in other debt-creating flows in 2008	13	20	20	20	22	23	27	31
NPV of Debt-to-Revenue Ratio 2/								
Baseline	64	65	67	70	77	81	107	135
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	64	61	63	67	75	80	107	159
A2. Primary balance is unchanged from 2006	64	64	69	76	86	94	130	192
A3. Permanently lower GDP growth 1/	64	66	69	74	83	89	121	196
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2008-2009	64	70	78	84	94	102	132	172
B2. Primary balance is at historical average minus one standard deviations in 2008-2009	64	63	67	70	76	81	98	117
B3. Combination of B1-B2 using one half standard deviation shocks	64	63	67	70	76	80	98	118
B5. 10 percent of GDP increase in other debt-creating flows in 2008	64	89	88	90	96	99	114	125
Debt Service-to-Revenue Ratio 2/								
Baseline	10	6	6	6	6	6	5	4
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	10	6	6	6	6	6	5	5
A2. Primary balance is unchanged from 2006	10	6	6	6	6	6	5	6
A3. Permanently lower GDP growth 1/	10	6	7	6	6	6	5	6
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2008-2009	10	6	7	7	7	7	5	6
B2. Primary balance is at historical average minus one standard deviations in 2008-2009	10	6	6	6	6	6	5	4
B3. Combination of B1-B2 using one half standard deviation shocks	10	6	7	6	6	6	5	4
B5. 10 percent of GDP increase in other debt-creating flows in 2008	10	6	7	6	7	6	5	5
Debt Service-to-GDP Ratio								
Baseline	2	1	1	1	1	1	1	1
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	2	1	1	1	1	1	1	1
A2. Primary balance is unchanged from 2006	2	1	1	1	1	1	1	2
A3. Permanently lower GDP growth 1/	2	1	1	1	1	1	1	2
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2008-2009	2	1	2	2	2	2	1	1
B2. Primary balance is at historical average minus one standard deviations in 2008-2009	2	1	1	1	1	1	1	1
B3. Combination of B1-B2 using one half standard deviation shocks	2	1	1	1	1	1	1	1
B5. 10 percent of GDP increase in other debt-creating flows in 2008	2	1	2	1	1	1	1	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 square root of 20 (i.e., the length of the projection period).

2/ Revenues are defined inclusive of grants.