



MALI

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SEVENTH REVIEW UNDER THE EXTENDED CREDIT FACILITY ARRANGEMENT, AND REQUEST FOR EXTENSION AND AUGMENTATION OF ACCESS—DEBT SUSTAINABILITY ANALYSIS UPDATE

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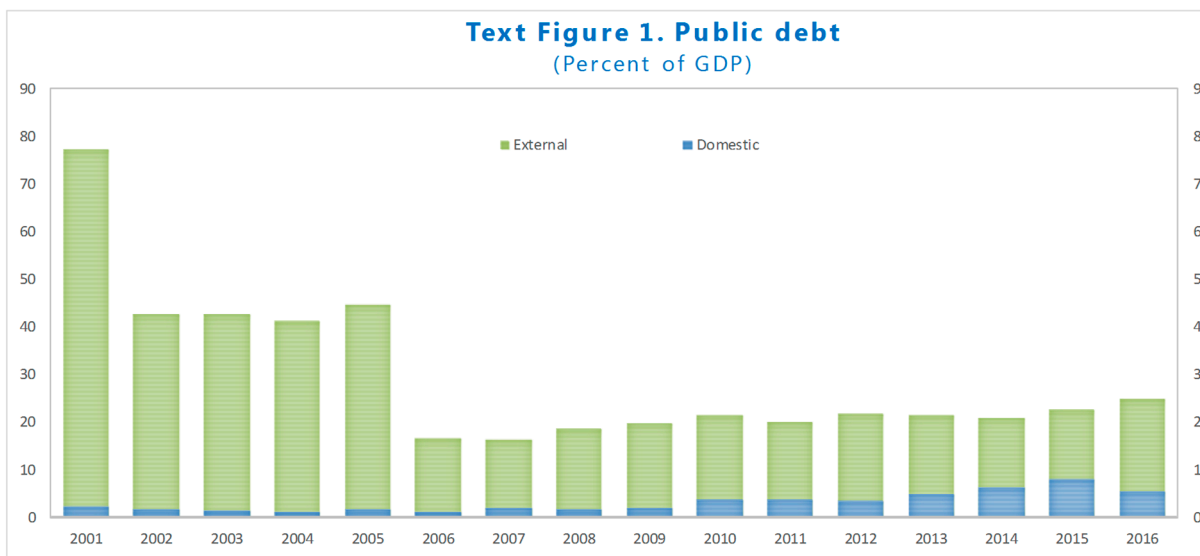
Prepared by staffs of the International Monetary Fund and the International Development Association

<i>Risk of external debt distress:</i>	<i>Moderate</i>
<i>Augmented by significant risks stemming from domestic public debt?</i>	<i>No</i>

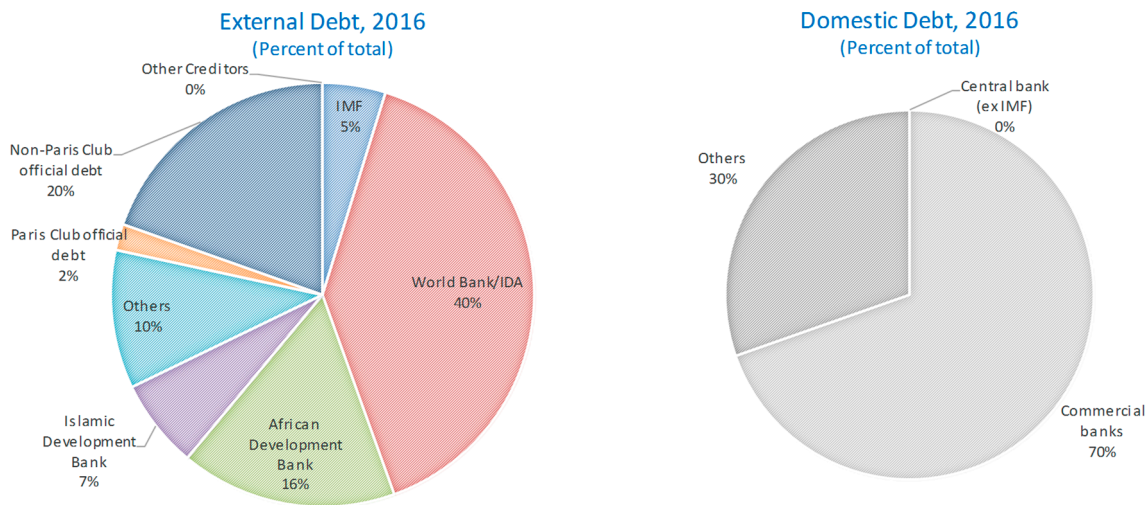
This debt sustainability analysis (DSA) updates the joint IMF/IDA DSA from the 6th ECF program review of November 2016 (Country report 16/375). It reflects updated information on the macroeconomic outlook, and the proposed access augmentation from the IMF, and indicates that Mali stands at moderate risk of debt distress—unchanged from the previous analysis. Under the baseline scenario all external debt indicators and debt service ratios lie below the policy-dependent thresholds throughout the projection period. Under worst-case stress scenarios, only the debt-to-export ratio breaches its threshold (as in the 2016 DSA). The country's external debt profile is vulnerable to changes in financing conditions, exchange rate depreciation, and shocks to export growth. The inclusion of domestic debt does not alter the assessment of Mali's debt sustainability.

BACKGROUND

1. At end-2016, Mali's stock of public debt was composed mostly of external debt on concessional terms (Text figure 1). External debt amounted to CFAF 2,074 billion (24.9 percent of GDP), and is held mostly by multilateral creditors (CFAF 1,678 billion). Domestic debt (5.5 percent of GDP), was held mostly by commercial banks in treasury bills and bonds issued on the WAEMU regional market (Text figure 2). It also included some domestic arrears validated through audits and recognized as debt by the authorities.



Text Figure 2. Holders of Mali's Public Debt, 2016



Sources: Malian authorities; and IMF staff calculations.

MACROECONOMIC OUTLOOK, 2017–37

2. This DSA is consistent with the macroeconomic framework underlying the Staff Report prepared for the seventh review of the ECF-supported program. Key macroeconomic assumptions are broadly similar to those used in the previous DSA and are as follows:

- **Real GDP growth.** The outlook for growth remains positive. In 2017, real output is projected at 5.3 percent and over the long term it converges to 4.7 percent - Mali's long-term growth potential (Text table 1).
- **Fiscal policy.** In 2017, despite steady spending pressures, the authorities are committed to containing the overall fiscal deficit (including grants) at 3.5 percent of GDP. This path would help them to achieve an overall fiscal balance of 3 percent of GDP by 2019, in line with the WAEMU convergence criterion.
- **External sector.** Despite a tighter monetary policy stance in the near term, the current account deficit (including grants) is projected to widen to an average of 7.3 percent (from 6 percent in the 6th review) during 2017–18 due to a deterioration in the terms of trade (higher oil prices, but lower gold prices), and strong import growth associated with public and private investment. Thereafter, the current account deficit is projected to narrow from 6.5 percent in 2018 to about 6.0 percent by 2022, and stabilize at about 6.3 percent of GDP over the longer term. This stabilization in the external position would be driven partly by supportive macroeconomic policies, gradual increase in other exports (including food, cotton, tourism and other minerals such as phosphate, uranium, bauxite, iron ore, copper, and nickel), and lower long-run oil prices. These factors should help to offset the expected steady decline in export earnings from gold.¹ The current account deficit continues to be financed mainly through foreign direct investment, public sector borrowing, and official grant flows.
- **Gross financing needs will be covered by a combination of external and domestic debt.** For 2017 and the near term, given the tighter regional financial conditions relative to the 6th review, the authorities plan to lower the issuance of domestic debt and progressively increase their reliance on external financing. The augmentation of access to IMF resources, and budgetary support from the EU, World Bank and AfDB will contribute to finance the 2017 budget. Over the long term, as access to regional financing sources is expected to gradually normalize, the composition of financing is expected to become again broadly similar to the previous DSA, with about 90 percent from external sources and 10 percent from regional and domestic sources.

3. The main differences in the medium-term macroeconomic assumptions with respect to the previous DSA are as follows (Text table 1):

¹ Gold export volumes are expected to decline steadily over time, with the share of gold in total exports projected to fall from 67 percent in 2015 to about 20 percent in 2036.

- GDP deflator in US dollar terms is projected to be lower during the projection period compared with the previous DSA. This result is driven by the projected depreciation of the national currency by 0.2 percent over the projection horizon, compared with an appreciation of a similar magnitude in the previous DSA.
- Gold prices are projected to be lower than in the previous DSA. At the same time, however, gold production is projected to be higher following an upward revision of reserves, and therefore gold export revenues as a share of GDP are projected to be higher compared with the previous DSA.²
- Oil prices during 2017 to 2018 are projected to be higher than in the previous DSA, but fall below it over the long term.
- The effective interest rate is projected to be marginally higher at 1.39 percent, compared with 1.36 percent in the previous DSA.

4. External debt accumulation would be slightly higher than in the previous DSA as the authorities are assumed to increase reliance on external funding during 2017–19 given tighter domestic and regional financial conditions. Public debt will grow from about 30.4 percent of GDP in 2016 to 42.8 percent in 2037. Of this, external debt would increase from about 25 percent of GDP to 36 percent in 2037.

² Higher gold output is based on discussions with the authorities during the mission. In particular, they are expecting gold output to be higher relative to the baseline over the medium-term. In addition, the gold reserves have increased slightly to 850 tons, from about 805 tons in the previous DSA.

Text Table 1. Mali: Evolution of Selected Macroeconomic Indicators

	2015	2016	2017	2018	2019	Long term ¹	
	Est	Projections					
Real GDP growth							
Current DSA	6.0	5.8	5.3	5.0	4.7	4.7	
Previous DSA	6.0	5.4	5.3	4.8	4.7	4.7	
GDP Deflator in US dollar terms							
Current DSA	-14.2	1.3	-2.9	1.1	0.7	2.0	
Previous DSA	-14.2	2.1	2.7	1.6	1.4	1.9	
Overall fiscal deficit (excluding grants, percent of GDP)							
Current DSA	-4.5	-5.5	-5.7	-5.5	-5.0	-4.2	
Previous DSA	-4.5	-6.3	-6.1	-5.5	-4.9	-4.2	
Overall fiscal deficit (including grants, percent of GDP)							
Current DSA	-1.8	-3.9	-3.5	-3.4	-3.0	-3.0	
Previous DSA	-1.8	-4.3	-4.1	-3.5	-3.0	-3.0	
Current account deficit² (excluding grants, percent of GDP)							
Current DSA	-12.3	-14.6	-16.7	-14.7	-14.0	-7.5	
Previous DSA	-14.3	-17.0	-15.9	-13.3	-12.8	-7.8	
Current account deficit (including grants, percent of GDP)							
Current DSA	-5.3	-7.1	-8.2	-6.6	-6.2	-6.3	
Previous DSA	-7.3	-7.7	-6.8	-5.3	-5.3	-6.3	
Official aid³ (percent of GDP)							
Current DSA	5.6	3.4	5.2	5.2	5.5	4.6	
Previous DSA	5.6	4.4	4.5	4.7	5.1	4.6	
Gold prices (US\$/fine ounce London fix)							
Current DSA	1160	1248	1254	1281	1311	1333	
Previous DSA	1160	1276	1343	1373	1387	1418	
Gold exports (percent of GDP)							
Current DSA	13.0	13.8	13.5	13.4	13.0	7.4	
Previous DSA	12.8	12.7	13.0	12.4	11.8	5.2	
Oil prices (US\$/barrel)⁴							
Current DSA	51	43	55	55	54	55	
Previous DSA	51	42	49	52	54	58	

¹ Defined as the last 15 years of the projection period. For the current DSA, the long term covers the 2023-37 period. For the previous DSA, it covered 2022-36.

² The large current account (excluding grants) deficit in 2015-19 reflects the international military assistance, which is assumed to continue into the medium term. It is registered as imports of security services financed by grants, which average 6% of GDP per annum.

³ Defined as the sum of concessional grants and loans.

⁴ Simple average of three spot prices; Dated Brent, West Texas Intermediate, and the Dubai Fateh.

DEBT SUSTAINABILITY ANALYSIS

A. External DSA

5. The results of the external DSA confirm that Mali's debt dynamics are sustainable under the baseline scenario. Under the baseline scenario, all external debt ratios remain within their indicative thresholds, though one measure—public debt to exports ratio, as in the previous DSA, displays a distinct uptrend over the course of the forecast. The ratio for the present value (PV) of external public debt to GDP, calculated using a 5 percent discount rate, is projected to remain between 16 and 21 percent of GDP, well below the indicative threshold of 40 percent throughout the projection period (Figure 1a, panel b, and Table 1a). The present value (PV) of the external debt-to-revenue ratio is also projected to remain broadly stable between about 85 percent and 95 percent, comfortably below the 250 percent threshold (Figure 1a, panel d, and Table 1a). As production from existing and planned new gold mines declines starting in 2023 and growth of other exports only partly compensates for that decline, the PV of the external debt-to-exports ratio is projected to increase from about 67 percent in 2016 to 130 percent in 2037, but remains below the threshold of 150 percent (Figure 1a, panel c, and Table 1a).

6. Almost all debt indicators remain within indicative thresholds even under the most extreme scenario. The present values of the debt-to-GDP ratio, debt-to-revenue ratio, and liquidity measures of debt service to exports and revenues (excluding grants) all remain under the debt distress thresholds in the most extreme scenario (tighter financing conditions on public debt).³ However, the present value of debt-to-exports ratio, shows a breach of the threshold from 2027 to 2037 in line with the previous DSA.⁴ Going forward, however, the full implementation of the 2015 peace agreement and continued policy reforms should promote economic development, while increasing the overall flexibility and dynamism of the economy to cushion shocks. In particular, the ongoing scaling up and country-wide expansion of public sector investment in high-priority infrastructure augur well for increasing overall economy-wide productivity growth and lead to the development of other sectors. These initiatives would help to make the economy more diversified and resilient to export shocks.

7. Mali's external debt sustainability is sensitive to an export growth shock, a reduction in transfers and FDI and, a combination shock, along with changes in borrowing terms. Under a bounds test that reduces export growth temporarily in 2017–18 with the effect of reducing exports levels permanently, the PV of the debt-to-exports ratio would breach its threshold in 2031 (Table 1b, Scenario B2). A bounds test that reduces FDI and official and private transfers in 2017–18, would cause the PV of the debt-to-exports ratio to start rising toward threshold, almost breaching it in 2037 (Table 1b, Scenario B4). A bounds test that combines shocks to growth, export values, the US dollar GDP deflator and FDI would cause the debt to exports ratio to breach its threshold in 2032 (Table 1b, Scenario B5).

³ In the DSA methodology this is a permanent shock.

⁴ In the previous DSA the most extreme shock was a combination shock, which is by design a temporary shock for two years.

B. Public DSA

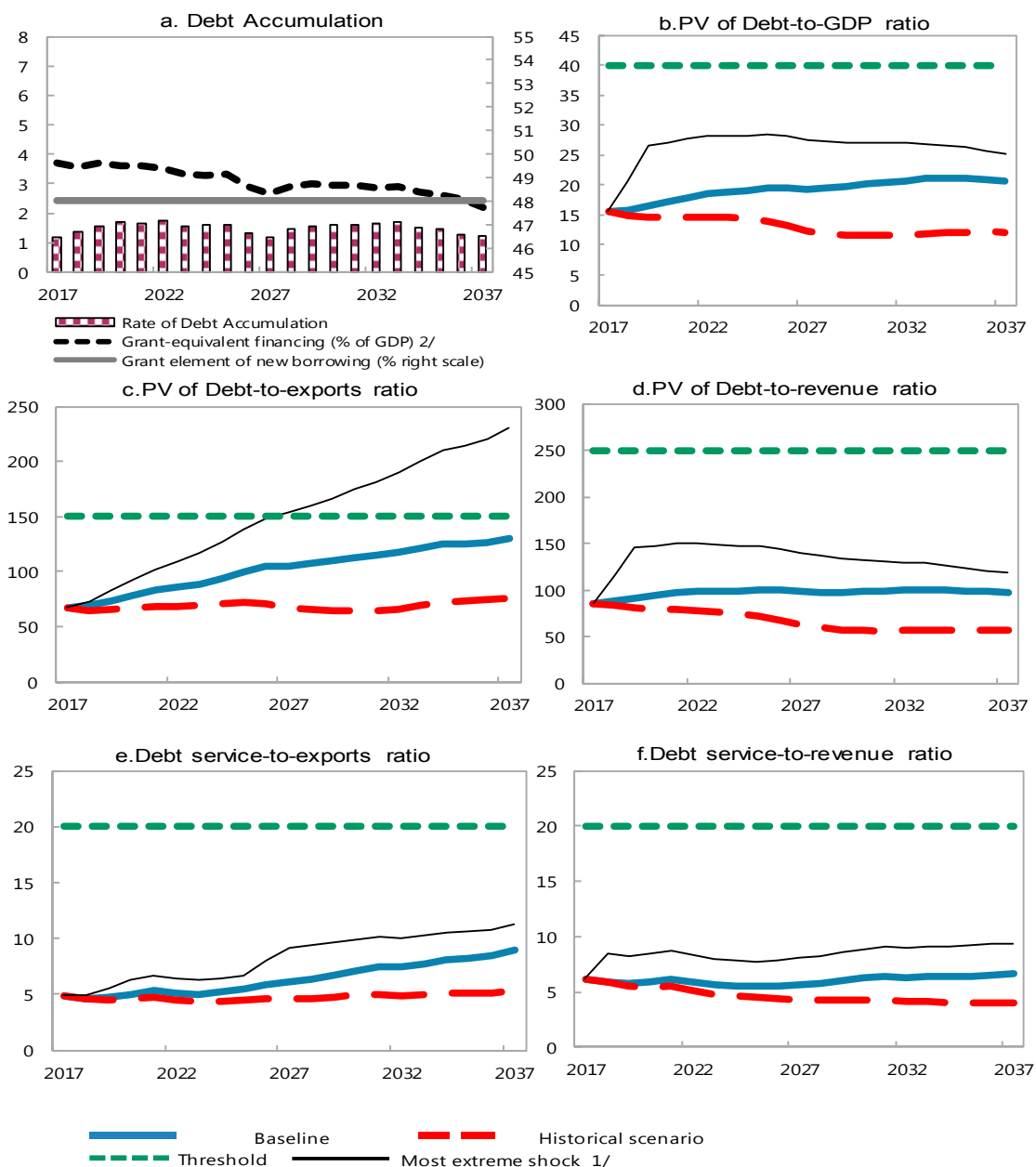
8. **The inclusion of domestic debt does not alter the assessment of Mali's debt sustainability.**

Given the small size of Mali's domestic debt and the planned reduction in domestic borrowing in the baseline scenario, the public debt sustainability analysis closely mirrors the external debt sustainability analysis (Figure 2 and Table 2a). The PV of public sector debt-to-GDP ratio stays between 22 and 27 percent of GDP during the entire projection period. That said, as stated in the previous DSA, the recent rapid growth of the domestic debt stock needs to be monitored closely to maintain debt sustainability and financial stability going forward.

CONCLUSION

9. **This updated DSA, as the previous one, suggests that Mali's risk of debt distress remains moderate.** As in the previous DSA, stress tests highlight a sustained breach of the threshold for the PV of public debt-to-exports under the most extreme shock. Mali's debt sustainability is highly sensitive to a tightening of financing terms, and a combination shock. In addition to a financing shock (less favorable terms for external finance looking forward- which yields the breach noted above), Mali's debt sustainability is also vulnerable to a reduction in transfers and FDI, and an export shock owing to the export concentration in gold. And as highlighted in the previous DSA, it remains crucial that Mali maintain prudent macroeconomic policies, strengthen the effectiveness of public debt management, and continue to meet its external financing needs with grants and concessional loans, wherever possible. In addition, the country should ensure that underlying projects deliver a high return on investment, while continuing the implementation of structural reforms to improve the investment climate and export diversification, amid an expected decline in gold's export performance over the medium term. The Malian authorities broadly agreed with the conclusions of the DSA. They indicated that they considered their economy could grow faster than envisaged by staff over the medium to long term, but shared staff's overall assessment.

Figure 1a. Mali: Indicators of Public and Publicly guaranteed External Debt under Alternative Scenarios, 2017–37

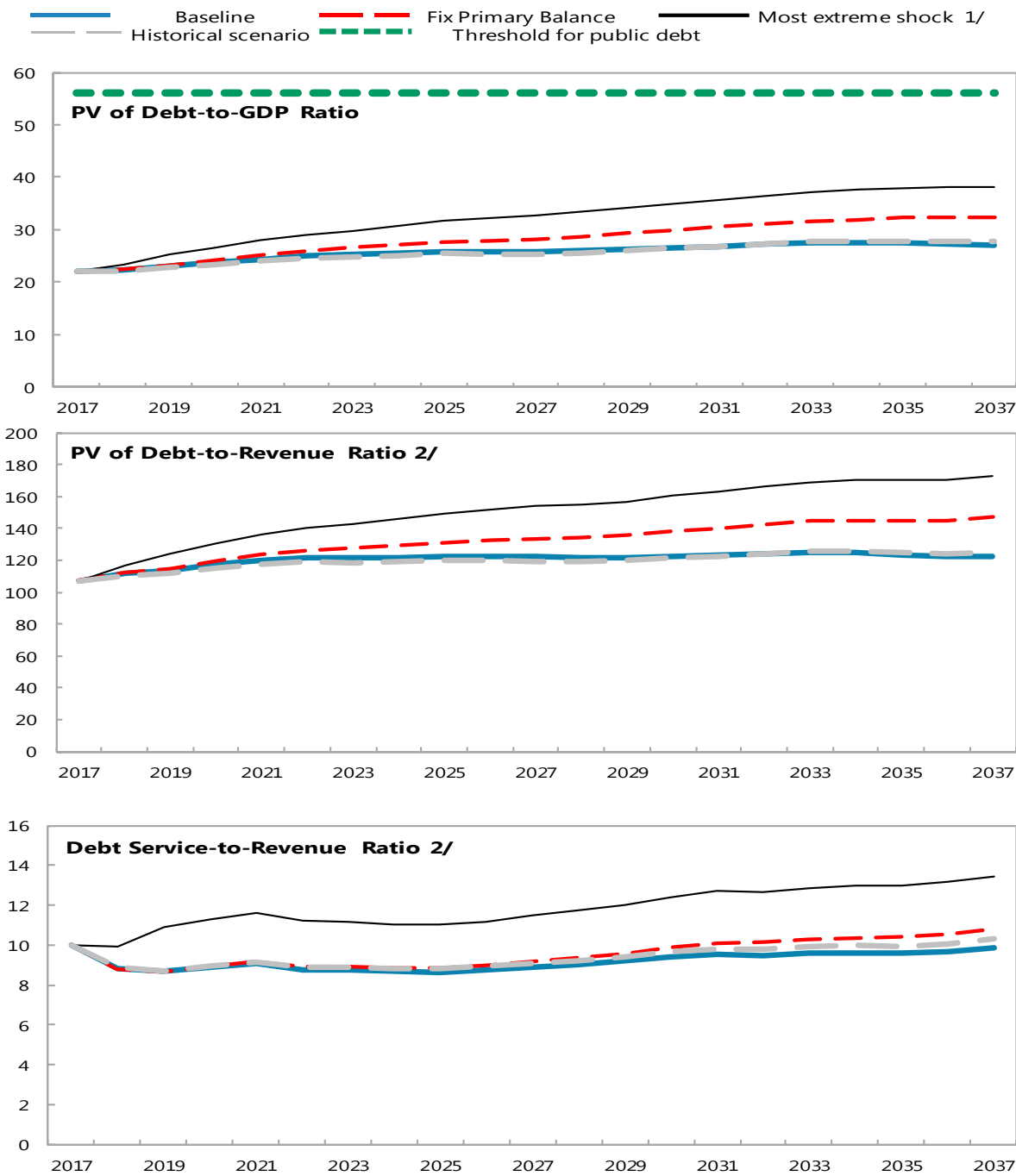


Sources: Country authorities; and staff estimates and projections.

1/ The most extreme stress test is the test that yields the highest ratio on or before 2027. In figure b, it corresponds to a B5. Combination of B1-B4 using one-half standard deviation shocks shock; in c, to a A2. New public sector loans on less favorable terms in 2017-2037 2 shock; in d, to a B4. Net non-debt creating flows at historical average minus one standard deviation in 2018-2019 4/ shock; in e, to a B4. Net non-debt creating flows at historical average minus one standard deviation in 2018-2019 4/ shock and in figure f, to a B6. One-time 30 percent nominal depreciation relative to the baseline in 2018 5/ shock

2/ The decline in grant-equivalent financing in 2016 reflects the return to more normal levels of concessional aid following the exceptionally high level of assistance related to the 2011-2012 crisis.

Figure 2. Mali: Indicators of Public Debt Under Alternative Scenarios, 2017-37



Sources: Country authorities; and staff estimates and projections.
 1/ The most extreme stress test is the test that yields the highest ratio on or before 2027.
 2/ Revenues are defined inclusive of grants.

Table 1a. Mali: External Debt Sustainability Framework, Baseline Scenario, 2017-37
(In percent of GDP, unless otherwise indicated)

	Actual			Historical ^{6/} Average	Standard ^{6/} Deviation	Projections									
	2014	2015	2016			2017	2018	2019	2020	2021	2022	2017-2022 Average		2027	2037	2023-2037 Average
External debt (nominal) 1/	21.0	22.6	24.9			25.3	26.1	27.4	28.9	30.2	31.4		32.9	36.3	
<i>of which: public and publicly guaranteed (PPG)</i>	21.0	22.6	24.9			25.3	26.1	27.4	28.9	30.2	31.4		32.9	36.3	
Change in external debt	-0.5	1.6	2.3			0.4	0.8	1.3	1.5	1.3	1.2		-0.2	-0.3	
Identified net debt-creating flows	2.0	6.0	4.2			5.5	4.1	3.8	3.7	3.6	3.4		4.1	3.2	
Non-interest current account deficit	4.5	5.0	6.8	6.5	3.8	7.9	6.3	5.9	5.9	5.7	5.5		6.3	5.5	5.8
Deficit in balance of goods and services	15.5	15.6	16.6			18.1	16.1	15.6	15.2	14.9	14.3		10.9	10.5	
Exports	22.5	24.0	22.9			23.1	23.1	22.5	21.9	21.5	21.7		18.4	15.8	
Imports	38.0	39.6	39.5			41.2	39.2	38.1	37.1	36.4	36.0		29.3	26.3	
Net current transfers (negative = inflow)	-13.5	-12.5	-12.5	-9.2	3.9	-13.5	-13.1	-12.8	-12.3	-12.1	-11.7		-6.4	-5.9	-6.3
<i>of which: official</i>	-8.0	-7.0	-7.5			-8.5	-8.1	-7.8	-7.3	-7.0	-6.7		-1.4	-0.9	
Other current account flows (negative = net inflow)	2.4	2.0	2.7			3.3	3.2	3.1	3.0	2.9	2.8		1.8	0.9	
Net FDI (negative = inflow)	-1.0	-1.5	-1.4	-2.8	1.9	-1.4	-1.2	-1.2	-1.2	-1.2	-1.2		-1.2	-1.2	-1.2
Endogenous debt dynamics 2/	-1.5	2.4	-1.2			-1.0	-0.9	-0.9	-0.9	-0.9	-1.0		-1.0	-1.1	
Contribution from nominal interest rate	0.2	0.3	0.3			0.3	0.3	0.3	0.3	0.4	0.4		0.4	0.5	
Contribution from real GDP growth	-1.4	-1.4	-1.2			-1.3	-1.2	-1.2	-1.2	-1.3	-1.3		-1.5	-1.6	
Contribution from price and exchange rate changes	-0.3	3.5	-0.3			...	...	...	...	...	...		...	...
Residual (3-4) 3/	-2.4	-4.3	-1.9			-5.1	-3.3	-2.5	-2.3	-2.3	-2.1		-4.3	-3.6	
<i>of which: exceptional financing</i>	0.0	-0.2	-0.2			-0.2	-0.2	-0.2	-0.1	-0.1	0.0		0.0	0.0	
PV of external debt 4/	...	...	15.5			15.5	15.9	16.5	17.3	17.9	18.5		19.4	20.6	
In percent of exports	...	...	67.4			67.2	68.9	73.4	78.7	83.3	85.5		105.4	130.1	
PPG external debt	...	...	15.5			15.5	15.9	16.5	17.3	17.9	18.5		19.4	20.6	
In percent of exports	...	...	67.4			67.2	68.9	73.4	78.7	83.3	85.5		105.4	130.1	
In percent of government revenues	...	...	92.6			85.1	88.6	90.5	93.7	96.9	98.4		98.5	96.7	
Debt service-to-exports ratio (in percent)	4.3	6.5	4.4			4.9	4.6	4.7	5.0	5.3	5.1		6.1	8.9	
PPG debt service-to-exports ratio (in percent)	4.3	6.5	4.4			4.9	4.6	4.7	5.0	5.3	5.1		6.1	8.9	
PPG debt service-to-revenue ratio (in percent)	6.5	9.5	6.1			6.2	5.9	5.8	5.9	6.2	5.9		5.7	6.6	
Total gross financing need (Billions of U.S. dollars)	0.6	0.7	0.9			1.1	0.9	0.9	1.0	1.0	1.0		1.6	2.9	
Non-interest current account deficit that stabilizes debt ratio	4.9	3.4	4.5			7.5	5.5	4.6	4.4	4.4	4.2		6.5	5.8	
Key macroeconomic assumptions															
Real GDP growth (in percent)	7.0	6.0	5.8	4.2	2.3	5.3	5.0	4.7	4.7	4.7	4.7	4.8	4.7	4.7	4.7
GDP deflator in US dollar terms (change in percent)	1.6	-14.2	1.3	3.5	9.6	-2.9	1.1	0.7	0.9	0.9	1.2	0.3	1.8	2.3	2.0
Effective interest rate (percent) 5/	1.2	1.4	1.5	1.5	0.3	1.2	1.2	1.2	1.3	1.3	1.4	1.3	1.4	1.5	1.4
Growth of exports of G&S (US dollar terms, in percent)	-1.9	-2.8	2.1	6.3	11.2	3.2	5.9	2.9	3.0	3.6	6.8	4.2	5.4	3.1	4.5
Growth of imports of G&S (US dollar terms, in percent)	3.5	-5.2	6.9	10.8	19.0	6.7	1.1	2.5	2.9	3.7	4.8	3.6	5.6	5.5	4.6
Grant element of new public sector borrowing (in percent)	...	...	...	...	...	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0
Government revenues (excluding grants, in percent of GDP)	14.9	16.4	16.7			18.3	17.9	18.3	18.4	18.5	18.8		19.7	21.3	20.3
Aid flows (in Billions of US dollars) 7/	0.6	0.7	0.5			0.6	0.6	0.7	0.7	0.8	0.8		0.8	1.4	
<i>of which: Grants</i>	0.3	0.4	0.2			0.3	0.3	0.3	0.3	0.3	0.3		0.4	0.4	
<i>of which: Concessional loans</i>	0.2	0.4	0.3			0.3	0.3	0.4	0.4	0.4	0.5		0.5	1.0	
Grant-equivalent financing (in percent of GDP) 8/	...	...	...			3.7	3.6	3.7	3.6	3.6	3.5		2.7	2.2	2.9
Grant-equivalent financing (in percent of external financing) 8/	...	...	...			70.9	69.1	67.5	65.6	65.8	64.9		67.2	58.4	62.8
Memorandum items:															
Nominal GDP (Billions of US dollars)	14.4	13.1	14.0			14.4	15.2	16.1	17.0	18.0	19.0		26.4	50.7	
Nominal dollar GDP growth	8.8	-9.1	7.1			2.3	6.2	5.5	5.7	5.7	6.0	5.2	6.6	7.1	6.7
PV of PPG external debt (in Billions of US dollars)	...	...	2.1			2.2	2.4	2.7	2.9	3.2	3.5		5.1	10.4	
(PVt-PVt-1)/GDPt-1 (in percent)	...	...	...			1.2	1.3	1.6	1.7	1.6	1.7	1.5	1.2	1.2	1.5
Gross workers' remittances (Billions of US dollars)	0.8	0.7	0.7			0.7	0.8	0.8	0.9	0.9	1.0		1.3	2.5	
PV of PPG external debt (in percent of GDP + remittances)	...	...	14.7			14.8	15.1	15.7	16.4	17.1	17.7		18.4	19.6	
PV of PPG external debt (in percent of exports + remittances)	...	...	55.4			55.3	56.6	60.1	64.0	67.5	69.5		82.8	98.9	
Debt service of PPG external debt (in percent of exports + remittances)	...	...	3.6			4.0	3.8	3.8	4.0	4.3	4.2		4.8	6.8	

Sources: Country authorities; and staff estimates and projections.

1/ Public sector external debt only.

2/ Derived as $[r - g - \rho(1+g)] / (1+g+\rho+g\rho)$ 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); project grants, changes in gross foreign assets; and valuation adjustments. For projections also includes contribution from price and exchange rate changes. The calculation of the residual assumes the capital account is a debt-creating flow, which is inappropriate in Mali's case since the capital account consists primarily of project grants (around 2% of GDP).

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, 2017-37

(In percent of GDP, unless otherwise indicated)

	Projections											
	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2037
PV of Debt-to-GDP ratio												
Baseline	16	16	17	17	18	19	19	19	19	19	19	21
A. Alternative Scenarios												
A1. Key variables at their historical averages in 2017-2037 1/	16	15	15	15	15	15	15	14	14	13	12	12
A2. New public sector loans on less favorable terms in 2017-2037 2	16	17	19	20	22	24	25	26	27	28	28	36
B. Bound Tests												
B1. Real GDP growth at historical average minus one standard deviation in 2018-2019	16	16	18	18	19	20	20	20	20	21	20	22
B2. Export value growth at historical average minus one standard deviation in 2018-2019 3/	16	17	20	21	21	22	22	22	22	22	22	22
B3. US dollar GDP deflator at historical average minus one standard deviation in 2018-2019	16	17	19	20	21	21	22	22	22	22	22	24
B4. Net non-debt creating flows at historical average minus one standard deviation in 2018-2019 4/	16	21	26	26	27	27	27	27	27	27	26	24
B5. Combination of B1-B4 using one-half standard deviation shocks	16	21	27	27	28	28	28	28	28	28	28	25
B6. One-time 30 percent nominal depreciation relative to the baseline in 2018 5/	16	23	24	25	25	26	27	27	28	28	27	29
PV of Debt-to-exports ratio												
Baseline	67	69	73	79	83	86	89	94	100	105	105	130
A. Alternative Scenarios												
A1. Key variables at their historical averages in 2017-2037 1/	67	65	65	67	68	68	69	70	72	71	67	76
A2. New public sector loans on less favorable terms in 2017-2037 2	67	73	82	92	102	109	117	127	139	149	153	230
B. Bound Tests												
B1. Real GDP growth at historical average minus one standard deviation in 2018-2019	67	69	73	79	83	85	89	94	100	104	105	130
B2. Export value growth at historical average minus one standard deviation in 2018-2019 3/	67	83	107	114	119	121	125	131	139	145	145	165
B3. US dollar GDP deflator at historical average minus one standard deviation in 2018-2019	67	69	73	79	83	85	89	94	100	104	105	130
B4. Net non-debt creating flows at historical average minus one standard deviation in 2018-2019 4/	67	89	114	119	124	125	128	133	140	145	143	149
B5. Combination of B1-B4 using one-half standard deviation shocks	67	90	117	123	128	129	132	138	145	151	149	158
B6. One-time 30 percent nominal depreciation relative to the baseline in 2018 5/	67	69	73	79	83	85	89	94	100	104	105	130
PV of Debt-to-revenue ratio												
Baseline	85	89	90	94	97	98	99	99	100	100	99	97
A. Alternative Scenarios												
A1. Key variables at their historical averages in 2017-2037 1/	85	83	80	79	79	78	77	74	72	68	63	56
A2. New public sector loans on less favorable terms in 2017-2037 2	85	94	101	110	119	125	130	134	139	141	143	171
B. Bound Tests												
B1. Real GDP growth at historical average minus one standard deviation in 2018-2019	85	91	96	99	102	104	104	105	106	105	104	102
B2. Export value growth at historical average minus one standard deviation in 2018-2019 3/	85	96	110	112	115	116	115	115	116	114	112	102
B3. US dollar GDP deflator at historical average minus one standard deviation in 2018-2019	85	95	105	108	112	114	114	114	115	115	114	112
B4. Net non-debt creating flows at historical average minus one standard deviation in 2018-2019 4/	85	115	140	142	144	144	142	141	141	138	134	111
B5. Combination of B1-B4 using one-half standard deviation shocks	85	115	145	147	150	150	148	147	147	144	140	118
B6. One-time 30 percent nominal depreciation relative to the baseline in 2018 5/	85	126	129	133	137	140	140	141	142	141	140	137

Table 1b. Mali: Sensitivity Analysis for Key Indicators of Public and Publicly Guaranteed External Debt, 2017-37 (continued)

(In percent of GDP, unless otherwise indicated)

	Projections											
	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2037
Debt service-to-exports ratio												
Baseline	5	5	5	5	5	5	5	5	5	6	6	9
A. Alternative Scenarios												
A1. Key variables at their historical averages in 2017-2037 1/	5	5	4	5	5	4	4	4	5	5	5	5
A2. New public sector loans on less favorable terms in 2017-2037 2	5	5	5	5	6	6	6	7	7	8	9	14
B. Bound Tests												
B1. Real GDP growth at historical average minus one standard deviation in 2018-2019	5	5	5	5	5	5	5	5	5	6	6	9
B2. Export value growth at historical average minus one standard deviation in 2018-2019 3/	5	5	6	6	7	7	6	7	7	8	9	12
B3. US dollar GDP deflator at historical average minus one standard deviation in 2018-2019	5	5	5	5	5	5	5	5	5	6	6	9
B4. Net non-debt creating flows at historical average minus one standard deviation in 2018-2019 4/	5	5	5	6	6	6	6	6	6	8	9	11
B5. Combination of B1-B4 using one-half standard deviation shocks	5	5	5	6	7	6	6	6	7	8	9	11
B6. One-time 30 percent nominal depreciation relative to the baseline in 2018 5/	5	5	5	5	5	5	5	5	5	6	6	9
Debt service-to-revenue ratio												
Baseline	6	6	6	6	6	6	6	5	5	6	6	7
A. Alternative Scenarios												
A1. Key variables at their historical averages in 2017-2037 1/	6	6	5	5	5	5	5	5	5	4	4	4
A2. New public sector loans on less favorable terms in 2017-2037 2	6	6	6	6	7	7	7	7	7	8	8	10
B. Bound Tests												
B1. Real GDP growth at historical average minus one standard deviation in 2018-2019	6	6	6	6	7	6	6	6	6	6	6	7
B2. Export value growth at historical average minus one standard deviation in 2018-2019 3/	6	6	6	6	7	6	6	6	6	6	7	7
B3. US dollar GDP deflator at historical average minus one standard deviation in 2018-2019	6	6	7	7	7	7	6	6	6	6	7	8
B4. Net non-debt creating flows at historical average minus one standard deviation in 2018-2019 4/	6	6	6	7	7	7	7	6	6	7	8	8
B5. Combination of B1-B4 using one-half standard deviation shocks	6	6	7	8	8	7	7	7	7	8	9	8
B6. One-time 30 percent nominal depreciation relative to the baseline in 2018 5/	6	8	8	8	9	8	8	8	8	8	8	9
<i>Memorandum item:</i>												
Grant element assumed on residual financing (i.e., financing required above baseline) 6/	43	43	43	43	43	43	43	43	43	43	43	43

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, 2017–37

(In percent of GDP, unless otherwise indicated)

	Actual		Average	s/	Standard Deviation	s/	Estimate					Projections			
	2015	2016					2017	2018	2019	2020	2021	2022	2017-22 Average	2027	2037	2023-37 Average
Public sector debt 1/	30.7	30.4					31.8	32.6	33.9	35.4	36.7	37.9		39.3	42.8
<i>of which: foreign-currency denominated</i>	22.6	24.9					25.3	26.1	27.4	28.9	30.2	31.4		32.9	36.3
Change in public sector debt	3.4	-0.3					1.4	0.8	1.3	1.5	1.3	1.2		-0.2	-0.3
Identified debt-creating flows	2.1	2.5					1.4	1.2	1.1	1.2	1.1	0.9		0.5	0.0
Primary deficit	1.2	3.3	2.2	0.9			2.8	2.7	2.4	2.4	2.3	2.3	2.5	2.2	2.0
Revenue and grants	19.1	18.3					20.6	20.0	20.3	20.3	20.4	20.6		21.1	22.0
<i>of which: grants</i>	2.7	1.6					2.3	2.1	2.0	1.9	1.9	1.8		1.5	0.8
Primary (noninterest) expenditure	20.3	21.6					23.3	22.8	22.7	22.6	22.7	22.9		23.3	24.0
Automatic debt dynamics	0.9	-0.7					-1.3	-1.3	-1.1	-1.1	-1.2	-1.4		-1.6	-2.0
Contribution from interest rate/growth differential	-1.5	-1.5					-1.4	-1.5	-1.4	-1.4	-1.5	-1.6		-1.7	-1.9
<i>of which: contribution from average real interest rate</i>	0.0	0.2					0.1	0.0	0.1	0.1	0.1	0.0		0.1	0.0
<i>of which: contribution from real GDP growth</i>	-1.5	-1.7					-1.5	-1.5	-1.5	-1.5	-1.6	-1.6		-1.8	-1.9
Contribution from real exchange rate depreciation	2.4	0.8					0.1	0.2	0.3	0.3	0.4	0.2		...	...
Other identified debt-creating flows	-0.1	0.0					-0.1	-0.2	-0.2	0.0	0.0	0.0		0.0	0.0
Privatization receipts (negative)	0.1	0.2					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
Debt relief (HIPC and other)	-0.2	-0.2					-0.2	-0.2	-0.2	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
Residual, including asset changes	1.3	-2.8					0.0	-0.5	0.2	0.2	0.2	0.2		-0.7	-0.3
Other Sustainability Indicators															
PV of public sector debt	...	20.9					22.1	22.4	23.0	23.8	24.4	25.0		25.8	27.0
<i>of which: foreign-currency denominated</i>	...	15.5					15.5	15.9	16.5	17.3	17.9	18.5		19.4	20.6
<i>of which: external</i>	...	15.5					15.5	15.9	16.5	17.3	17.9	18.5		19.4	20.6
Gross financing need 2/	7.7	7.9					7.5	6.0	5.6	5.7	5.7	5.6		5.5	5.6
PV of public sector debt-to-revenue and grants ratio (in percent)	...	114.5					107.3	111.8	113.3	117.1	119.9	121.3		122.2	122.7
PV of public sector debt-to-revenue ratio (in percent)	...	125.4					120.7	124.9	126.0	129.0	132.0	132.7		131.3	127.0
<i>of which: external 3/</i>	...	92.6					85.1	88.6	90.5	93.7	96.9	98.4		98.5	96.7
Debt service-to-revenue and grants ratio (in percent) 4/	11.2	9.6					10.0	8.8	8.7	8.9	9.1	8.8		8.9	9.9
Debt service-to-revenue ratio (in percent) 4/	13.1	10.5					11.3	9.9	9.6	9.8	10.0	9.6		9.6	10.2
Primary deficit that stabilizes the debt-to-GDP ratio	-2.2	3.5					1.4	2.0	1.1	0.9	1.0	1.1		2.4	2.3
Key macroeconomic and fiscal assumptions															
Real GDP growth (in percent)	6.0	5.8	4.2	2.3			5.3	5.0	4.7	4.7	4.7	4.7	4.8	4.7	4.7
Average nominal interest rate on forex debt (in percent)	1.4	1.5	1.5	0.3			1.2	1.2	1.2	1.3	1.3	1.4	1.3	1.4	1.5
Average real interest rate on domestic debt (in percent)	2.3	3.3	1.5	3.5			6.6	3.7	4.4	4.4	4.1	3.9	4.5	4.4	3.9
Real exchange rate depreciation (in percent, + indicates depreciation)	12.3	3.6	0.0	8.7			0.2	...	...	...	...	...	...	...	...
Inflation rate (GDP deflator, in percent)	2.8	1.5	4.4	3.3			1.2	1.4	0.7	0.9	1.2	1.2	1.1	1.8	2.3
Growth of real primary spending (deflated by GDP deflator, in percent)	11.3	12.1	3.1	5.1			14.0	2.5	4.2	4.5	4.8	5.8	6.0	3.7	3.8
Grant element of new external borrowing (in percent)	...	...	...	...			48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0

Sources: Country authorities; and staff estimates and projections.

1/ Gross debt of central government

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. The historical average for the primary deficit, however, excludes 2006 (the year of MDRI debt relief and hence an unusually large primary surplus).

Table 2b. Mali: Sensitivity Analysis for Key Indicators of Public Debt, 2017–37

	Projections							
	2017	2018	2019	2020	2021	2022	2027	2037
PV of Debt-to-GDP Ratio								
Baseline	22	22	23	24	24	25	26	27
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	22	22	23	23	24	25	25	28
A2. Primary balance is unchanged from 2017	22	22	23	24	25	26	28	32
A3. Permanently lower GDP growth 1/	22	23	23	24	25	26	30	40
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2018-2019	22	23	25	27	28	29	33	38
B2. Primary balance is at historical average minus one standard deviations in 2018-2019	22	22	23	24	25	25	26	27
B3. Combination of B1-B2 using one half standard deviation shocks	22	23	24	25	26	27	29	33
B4. One-time 30 percent real depreciation in 2018	22	28	28	28	28	28	26	24
B5. 10 percent of GDP increase in other debt-creating flows in 2018	22	28	29	29	30	30	30	30
PV of Debt-to-Revenue Ratio 2/								
Baseline	107	112	113	117	120	121	122	123
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	107	110	112	115	117	119	119	125
A2. Primary balance is unchanged from 2017	107	112	115	120	124	126	133	147
A3. Permanently lower GDP growth 1/	107	113	115	120	124	128	140	180
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2018-2019	107	116	124	131	136	141	154	173
B2. Primary balance is at historical average minus one standard deviations in 2018-2019	107	112	115	119	122	123	124	124
B3. Combination of B1-B2 using one half standard deviation shocks	107	113	116	122	126	130	138	151
B4. One-time 30 percent real depreciation in 2018	107	141	138	138	136	134	123	108
B5. 10 percent of GDP increase in other debt-creating flows in 2018	107	140	141	144	146	147	143	135
Debt Service-to-Revenue Ratio 2/								
Baseline	10	9	9	9	9	9	9	10
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	10	9	9	9	9	9	9	10
A2. Primary balance is unchanged from 2017	10	9	9	9	9	9	9	11
A3. Permanently lower GDP growth 1/	10	9	9	9	9	9	10	12
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2018-2019	10	9	9	10	10	10	10	12
B2. Primary balance is at historical average minus one standard deviations in 2018-2019	10	9	9	9	9	9	9	10
B3. Combination of B1-B2 using one half standard deviation shocks	10	9	9	9	9	9	9	11
B4. One-time 30 percent real depreciation in 2018	10	10	11	11	12	11	11	13
B5. 10 percent of GDP increase in other debt-creating flows in 2018	10	9	9	10	10	9	10	11

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.