

Senegal: Joint Bank-Fund Debt Sustainability Analysis

This analysis assesses the sustainability of Senegal's external public debt and total public debt (external and domestic). The debt sustainability analysis (DSA) was conducted jointly by the staffs of the IMF and the World Bank, using the joint Bank-Fund framework for debt sustainability analysis for low-income countries (LIC). The data in this DSA were updated by Fund staff and Senegalese authorities during the October 2006 Article IV consultation mission.

The risk of debt distress in Senegal is low during the period 2006-26, given the low current level of debt, and assuming the fiscal deficit remains below 4 percent of GDP on the average, real interest rates remain below real GDP growth rate and the inflow of concessional funds is sustained at historical levels.¹ Under the baseline scenario, which assumes fiscal deficit and inflow of concessional funds aligned with historical trends, the net present value (NPV) of total (domestic and external) public and publicly guaranteed (PPG) debt-to-GDP ratio will remain below its policy-dependent threshold during the whole projection period. The total PPG debt service-to-revenues ratio (including short-term debt service) will nevertheless double to 30 percent in five years if the average maturity of new debt remains at the current one year. Debt burden indicators worsen significantly if borrowing terms deteriorate or if the fiscal deficit remains high.

BACKGROUND

Senegal debt sustainability indicators improved substantially after the enhanced HIPC Initiative and the Multilateral Debt Relief Initiative (MDRI). Senegal reached its HIPC floating completion point in April 2004, when it received debt relief of about US\$488 million in NPV terms (about US\$850 million in nominal terms).² Debt relief under the HIPC has been granted by Kuwait and all Paris Club creditors except Sweden. China has committed to cancel all Senegal's debt. In 2005, Senegal qualified for further debt cancellation under the MDRI when the IMF, the International Development Association (IDA), and the African Development Fund (AfDF) cancelled their claims on Senegal amounting to about US\$1.4 billion in nominal terms (19 percent of 2006 GDP in NPV terms).³ As a result of these two initiatives, the NPV of external PPG debt outstanding is estimated to have amounted to 13

¹ The risk of debt distress is considered low if all debt indicators are well below relevant country-specific debt-burden thresholds and stress testing does not result in indicators significantly breaching thresholds.

² See *Senegal: Enhanced Initiative for HIPC-Completion Point Document* (Country Report 04/130)

³ MDRI debt relief from the IMF became effective in January 5, 2006, providing stock relief on debt disbursed before end-2004 and still outstanding at end-2005. IDA and the AfDF started providing debt relief in July 2006. The eligible debt covers IDA credits disbursed before end-2003 and AfDF credits disbursed before end-2004 that are still outstanding at the time of qualification.

percent of GDP at end-2006. Public domestic debt is estimated at about 3 percent of GDP, of which $\frac{2}{3}$ is long-term.

The exposure of the private sector also appears limited. The International Investment Position compiled by the BCEAO for end-2004 indicates that the stock of private external debt (net of private external assets) is only 9 percent of GDP. The net private external debt includes trade credit (2 percent of GDP), currency and deposits owed by Senegalese banks to non-residents (3 percent of GDP) and loans taken abroad (3 percent of GDP).

METHODOLOGY AND BASELINE SCENARIO

Following the guidelines of the LIC DSA framework, staffs have analyzed the evolution of the total public debt stock and debt service indicators for Senegal subject to a baseline scenario and a series of stress tests.⁴ The stress tests are designed to assess a country's probability of facing debt distress in the future.⁵ The analysis is guided by indicative, country-specific external PPG debt-burden thresholds, which take into account the empirical finding that the external debt levels that a low-income country can sustain increase with the quality of its policies and institutions. The quality of policies and institutions is measured by the World Bank's 2005 Country Policy and Institutional Assessment (CPIA), according to which Senegal ranks as a "strong performer." The indicative external debt-burden thresholds for countries in this category are: (i) an NPV of external PPG debt-to-GDP ratio of 50 percent; (ii) an NPV of external PPG debt-to-exports ratio of 200 percent; (iii) an NPV of external PPG debt-to-revenue ratio of 300 percent; (iv) an external PPG debt service-to-exports ratio of 25 percent; (v) and an external medium and long-term PPG debt service-to-revenue ratio of 35 percent.

Broadly in line with the PRSP II, the baseline scenario assumes that:

- Economic performance will follow the trends observed during 2000-5 (Box 1 and Table 3). Economic growth will recover from around 3.3 percent in 2006 and range between 4.9 and 5.6 percent during 2007-26—3.8 percentage points higher than the average real interest rate on public debt over the period. The projected recovery in 2007-8 will be induced by the decline in international oil prices and the resolution of the financial crisis in Senegal's largest company (*Industries Chimiques du Sénégal* -

⁴ See "Operational Framework for Debt Sustainability Assessments in Low-Income Countries—Further Considerations," March 28, 2005 (www.imf.org). The new framework introduces some methodological changes in the calculation of the NPV of debt compared to the HIPC methodology by using (a) a fixed 5 percent discount rate instead of currency specific discount rates (under HIPC), (b) WEO exchange rate projections instead of fixed exchange rates as of the end of the base year and (c) annual exports instead of a three-year average of exports as the denominator in the NPV of debt-to-exports ratio.

⁵ The standard stress tests conducted for Senegal for external DSA are listed in Table 2 and for fiscal DSA in Table 4. The most-extreme stress tests (worst-case scenarios) depicted in Figures 1 and 2 and detailed in Box 2 are those with the worst indicator in 2016.

ICS).⁶ Beyond 2008, the reforms to improve the business environment will boost private investment and sustain economic growth close to the trend level of 5.1 percent per year observed in 2000-05.⁷

- The overall fiscal deficit (including transfers) will remain below 4 percent of GDP over 2007-26 on the average.
- The external current account deficit will decline during 2007-26 as export growth exceeds that of imports (Box 1 and Table 1). Growth in the exports of goods will outpace the growth in GDP in 2007-2026 as ICS, which accounts for about 10 percent of total exports, will gradually resume its activities during 2007-08, and structural reforms expand the export base. Imports as a percentage of GDP will fall in 2007-08 as oil prices decline and the local refinery resumes its operations. Remittances will grow slightly faster than GDP during the entire projection period.
- External borrowing on concessional terms will remain constant at trend level of about 3.5 percent of GDP throughout the projection period, with an average grant element of 45.3 percent (1.6 percent of GDP). The authorities intend to borrow abroad only on concessional terms. Financing needs of the public sector beyond that level will be covered almost entirely by short-term domestic borrowing on non-concessional terms, which is consistent with the debt management policy implemented in recent years.

Box 1. Senegal: Baseline Scenario (2007-26) - Main Assumptions

Real GDP growth	projected to average 5 percent per year
The external current account deficit	will decline from 12 percent of GDP in 2006 to 5.3 percent of GDP in 2026.
The primary fiscal deficit	will decline from 5 percent of GDP in 2006 to 2.6 percent of GDP in 2007, and gradually to 2.6 percent by 2026, which is consistent with historical performance.
External grants and concessional loans	will remain constant at 3.5 percent of GDP, with a grant element of 45.3 percent (1.6 percent of GDP).
New public sector domestic borrowing	assumed to be composed of 95 percent of short-term securities and 5 percent of long-term bonds.
Interest rate on private and domestic PPG debt	assumed to average 4.5 percent.

⁶ The price of oil is assumed to decline to US\$ 59 per barrel, at end-2006 from US\$ 68 in mid-2006, and rise to US\$ 64 at end-2008. It is projected to decline again to US\$59 at end-2011 and stabilize at that level for the rest of the projection period.

⁷ Excluding 2002, when a severe drought reduced real GDP growth to 0.7 percent.

EXTERNAL SUSTAINABILITY ANALYSIS

Under the baseline scenario, Senegal’s external PPG debt-burden indicators remain below the thresholds throughout the projection period. The NPV of external PPG debt-to-GDP ratio will rise slightly from 13 percent in 2006 to 15 percent by 2026 under this scenario, below the policy-dependent threshold of 50 percent for a strong performer such as Senegal. Similarly, the NPV of external PPG debt-to-exports ratio and the external PPG debt service-to-exports ratio are projected to remain under 56 and 6 percent, respectively, during the whole projection period, below their respective policy-dependent thresholds (Figure 1 and Table 2).

External debt sustainability indicators remain below the thresholds in case of all standard temporary shocks, including the most extreme.⁸ The most extreme stress test for Senegal consists of a combined two-year decline in GDP growth, export growth, capital inflows, and inflation.⁹ External PPG debt and debt service will rise sharply as a result of such a shock, but will remain below the thresholds during the projection period.

Box 2. Senegal: Standard Stress Tests (temporary shocks)			
	Baseline scenario	Worst-case scenarios for PPG debt sustainability	
		External DSA	Fiscal DSA (domestic and external)
Real GDP growth rate (percent)	5.0	3.3 in 2007-08	2.3 in 2007-08
Exports (in \$) growth rate (percent)	8.2	-1.0 in 2007-08	8.2
Net current transfers (percent of GDP)	8.8	4.5 in 2007-08	8.8
GDP (in \$) deflator (percent change)	2.1	-2.9 in 2007-08	2.1

The debt indicators are sensitive to borrowing terms. If all new external borrowing (3.5 percent of GDP annually on average) is concessional with an average grant element of 45.3 percent, the NPV of external PPG debt-to-GDP ratio will rise by only 2 percentage points in the projection period. However, it will grow by 21 percentage points and reach 34 percent in 2026 if all new external borrowing is non-concessional (Box 2, Figure 1 and Table 2). In this case, the debt indicators remain below the threshold during the projection period but continue to grow and eventually breach the thresholds. If financing under the worst-case shock is non-concessional, the NPV of external PPG debt-to-GDP ratio in 2008 will be 10 percentage points higher than if it is concessional. These results underline the need for the government to adhere strictly to the policy of borrowing externally only on concessional terms.

⁸ The effect of fiscal slippages on total PPG debt is analyzed in the next section.

The tests assume that balance-of-payments gaps are financed by public sector borrowing. External PPG debt indicators remain unchanged if the balance-of-payments gaps are financed by private sector borrowing.

⁹ The magnitude of the shocks in the worst-case scenarios is substantially more severe than the effect of delaying the resumption of ICS for one year, in which case GDP growth rate would be around 1.5 percentage point below the baseline scenario in 2007.

FISCAL SUSTAINABILITY ANALYSIS

Under the baseline scenario, the public debt indicators mirror the external debt indicators. The NPV of total PPG debt-to-GDP ratio and the NPV total PPG of debt-to-exports ratio will remain low during the entire projection period, even though the domestic portion of the total public debt is non-concessional. The medium and long-term debt service-to-revenues ratio will similarly remain low under the baseline scenario (Box 1, Figure 2, Tables 3 and 4).

The government may face rollover difficulties over the next 5 to 10 years owing to the growing share of short-term domestic debt (Figure 3). If the current policy of issuing short-term securities to close the financing gap continues in the medium-term, the total PPG debt service-to-revenue ratio (including short-term debt service) will double to 30 percent by 2011 before stabilizing at a high level, around 42 percent, over the rest of the period.¹⁰ These projections underline the need for Senegal to extend the maturities of public debt securities and to develop a liquid primary and secondary market for government debt.

Fiscal debt sustainability hinges on the reduction of the fiscal deficit to below 4 percent of GDP on the average. If the fiscal deficit remains at its 2006 level of 5.7 percent of GDP during the entire projection period, the NPV of total PPG debt-to-GDP ratio will reach 50 percent in 2021. The financing needs caused by the accumulated deficits could crowd out the private sector. The NPV of total debt-to-revenue ratio and debt service-to-revenue ratio (including short-term debt service) will follow similar trajectories, reaching 268 and 197 percent by 2026, respectively. This prospect highlights once again the need for the authorities to pursue a prudent fiscal policy over the medium-term (Figure 2 and Tables 3 and 4).

Temporary adverse shocks will require additional fiscal adjustment to reduce domestic borrowing needs and stabilize public debt. The most extreme shock for fiscal DSA, which involves GDP growth rate falling to 2.3 percent a year in 2007 and 2008 (equivalent to one standard deviation below its historical average), would raise the NPV of total PPG debt-to-GDP ratio to 50 percent by the end of the projection period. The NPV of total PPG debt-to-revenues ratio would follow a similar trajectory and reach 200 percent in 2022. The realization of a sizeable contingent liability equivalent to 10 percent of GDP in 2007 is less severe than the worst-case scenario. To insure that debt indicators remain within reasonable limits in case of a shock, the fiscal deficit should be reduced below the level assumed under the baseline scenario (Box 2, Figure 2 and Table 4).

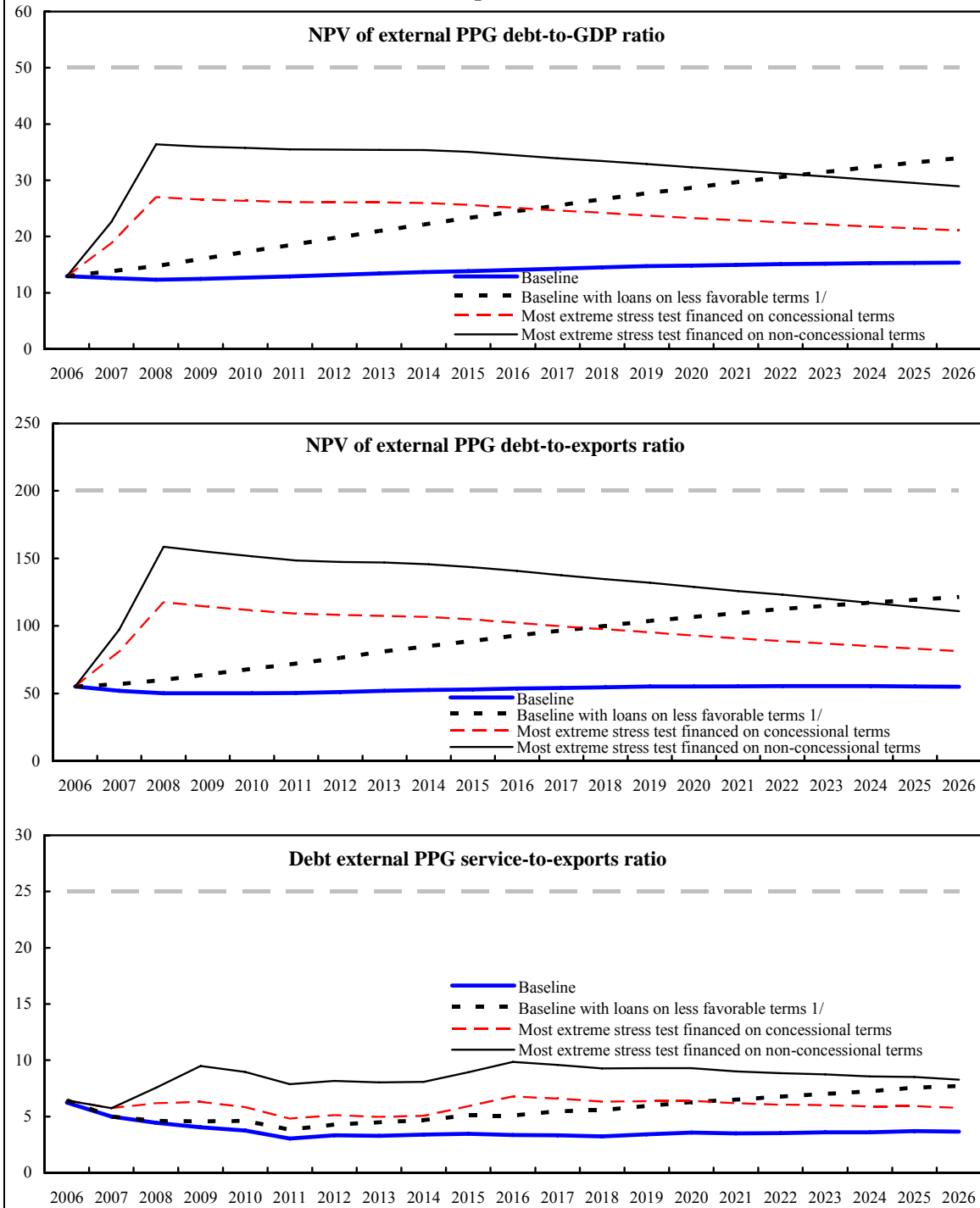
CONCLUSION

The risk of debt distress remains low. Debt indicators rise steeply during the projection period only if the overall fiscal deficit remains at its 2006 level of 5.7 percent of GDP, or the average maturity of new domestic debt remains at one year or less. Beyond 2026, the debt

¹⁰ See “Operational Framework for Debt Sustainability Assessments in Low-Income Countries—Further Considerations,” March 28, 2005 (www.imf.org).

distress may arise only if GDP does not grow as projected, or all borrowing is on non-concessional terms. In these cases, additional fiscal adjustment will be needed to ensure that the risk of debt distress stays low. This DSA highlights the need for Senegal to continue to adopt strict fiscal discipline, a prudent strategy regarding borrowing on non-concessional terms, and appropriate debt management policies.

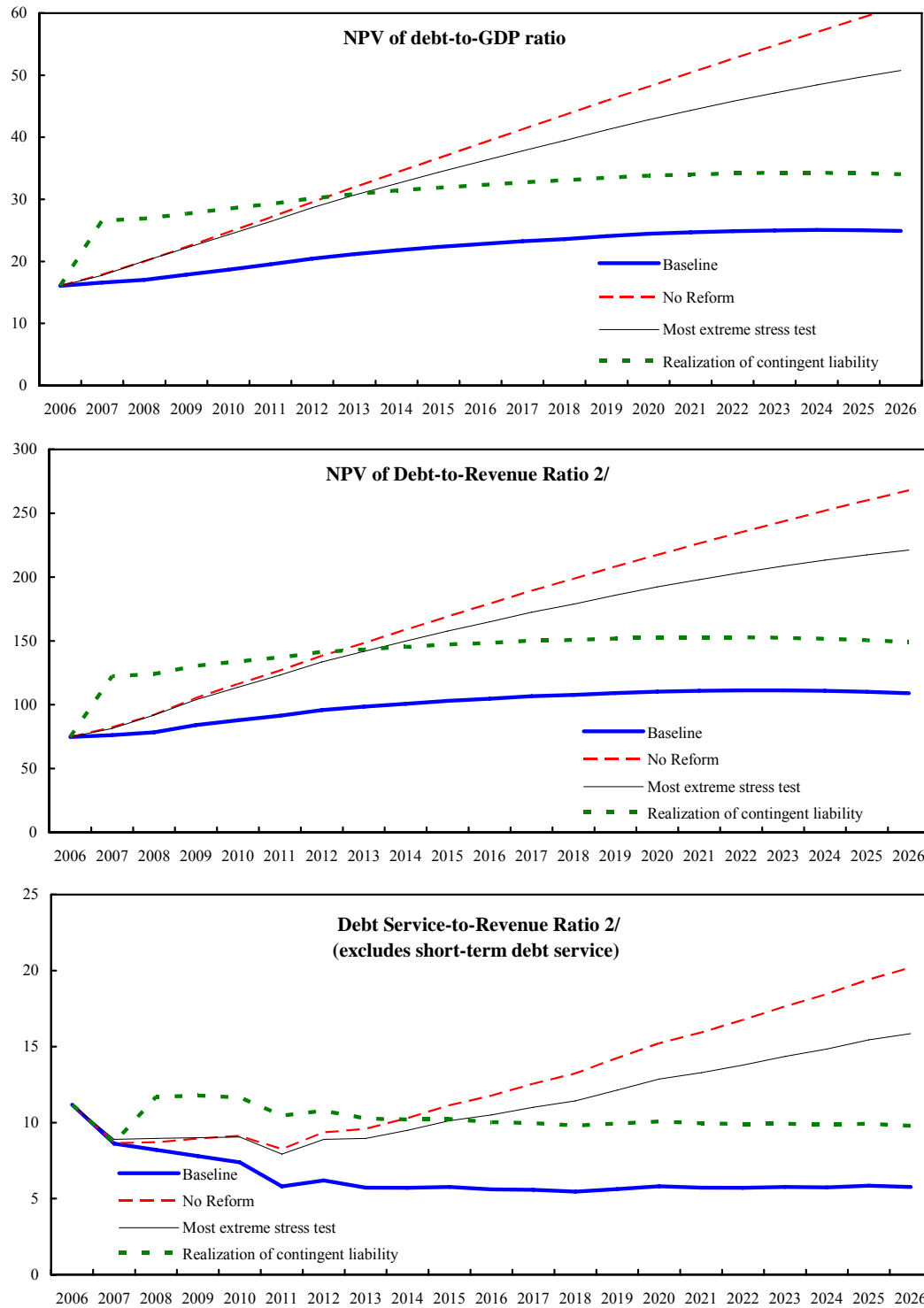
Figure 1. Senegal: Indicators of External PPG Debt Under Alternative Scenarios, 2006-2026 (In percent)



Source: Staff projections and simulations.

1/ Assumes that the interest rate on new borrowing is by 3.5 percentage points higher than in the baseline, while grace and maturity periods are the same as in the baseline.

Figure 2. Senegal: Indicators of Total PPG Debt Under Alternative Scenarios, 2006-2026 1/

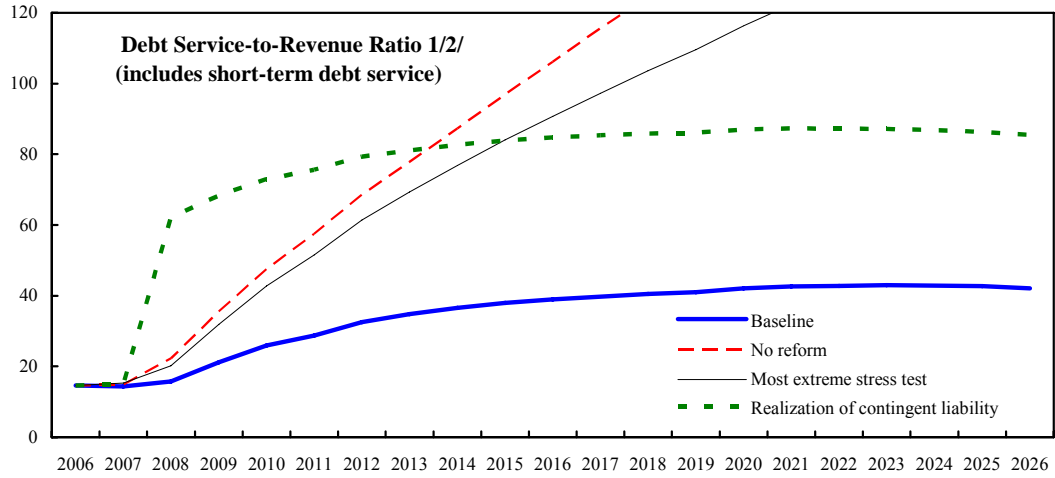


Source: Staff projections and simulations.

1/ Most extreme stress test is test that yields highest ratio in 2016.

2/ Revenue including grants.

Figure 3. Senegal: Indicators of Total PPG 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. Senegal: External PPG Debt Sustainability Framework, Baseline Scenario, 2006-2026 1/
(In percent of GDP, unless otherwise indicated)

	Actual						Historical Average 6/	Standard Deviation 6/	Projections									
	2000	2001	2002	2003	2004	2005			2006	2007	2008	2009	2010	2011	2006-11 Average	2016	2026	2012-26 Average
External debt (nominal) 1/	76.1	74.0	81.5	72.6	70.9	61.2			43.1	43.7	44.0	44.0	44.1	44.0		43.1	38.4	
o/w public and publicly guaranteed (PPG)	64.7	62.7	66.6	55.6	47.9	40.8			17.3	18.3	18.5	18.9	19.6	20.1		22.8	28.6	
Change in external debt	1.4	-2.1	7.5	-8.9	-1.7	-9.7			-18.1	0.7	0.2	0.0	0.2	-0.2		-0.2	-0.7	
Identified net debt-creating flows	12.5	0.6	-1.8	-12.2	-5.0	1.5			8.6	6.3	4.9	4.3	3.8	3.4		2.7	1.0	
Non-interest current account deficit	5.1	3.4	4.2	4.7	4.8	6.9	3.9	1.8	11.2	9.3	7.7	7.1	6.6	6.3	8.1	5.8	4.4	5.4
Deficit in balance of goods and services	9.3	9.0	10.4	12.2	12.8	15.7			19.8	17.6	16.0	15.5	15.0	14.8		14.4	13.2	
Exports	27.9	28.7	28.5	26.8	27.4	26.2			23.6	24.3	24.6	24.9	25.3	25.7		26.3	28.0	
Imports	37.2	37.8	39.0	39.0	40.2	41.9			43.4	41.9	40.7	40.4	40.3	40.4		40.7	41.2	
Net current transfers (negative = inflow)	-4.6	-6.2	-7.0	-7.9	-8.1	-9.1	-5.7	2.3	-9.1	-8.8	-8.9	-8.9	-9.0	-9.0	-9.0	-9.1	-9.4	-9.2
Other current account flows (negative = net inflow)	0.5	0.6	0.8	0.4	0.1	0.2			0.6	0.5	0.6	0.6	0.6	0.6		0.6	0.6	
Net FDI (negative = inflow)	-1.3	-0.8	-0.8	-0.7	-0.8	-1.2	-1.2	0.8	-1.5	-1.5	-1.6	-1.7	-1.8	-1.8	-1.7	-2.0	-2.2	-2.0
Endogenous debt dynamics 2/	8.7	-2.0	-5.2	-16.1	-8.9	-4.3			-1.1	-1.5	-1.2	-1.1	-1.1	-1.1		-1.2	-1.2	
Contribution from nominal interest rate	1.4	1.0	1.3	1.5	1.4	1.1			0.7	0.7	1.1	1.0	1.0	0.9		0.9	0.6	
Contribution from real GDP growth	-2.6	-3.4	-0.4	-4.3	-3.5	-3.6			-1.9	-2.2	-2.3	-2.1	-2.1	-2.0		-2.0	-1.8	
Contribution from price and exchange rate changes	9.9	0.4	-6.1	-13.4	-6.8	-1.8			...	...	...	...	...	...		...	...
Residual (3-4) 3/	-11.1	-2.7	9.3	3.2	3.3	-11.2			-26.7	-5.6	-4.7	-4.3	-3.6	-3.6		-2.9	-1.7	
o/w exceptional financing	-0.1	-0.4	-0.6	-1.0	-13.1	-2.3			-27.2	-1.3	-1.3	-1.2	-1.1	-1.1		-0.8	-0.4	
NPV of external debt 4/	...	...	...	...	...	33.1			38.8	38.1	37.8	37.5	37.3	36.8		34.4	25.1
In percent of exports	...	...	...	...	...	126.4			164.5	156.9	153.5	150.5	147.4	143.5		130.9	89.8
NPV of PPG external debt	...	...	...	...	...	12.7			13.0	12.6	12.3	12.5	12.7	12.9		14.1	15.4
In percent of exports	...	...	...	...	...	48.5			55.0	52.0	50.1	50.0	50.2	50.3		53.6	54.9
Debt service-to-exports ratio (in percent)	12.6	16.8	15.6	15.8	23.6	21.6			16.2	13.4	17.8	17.3	16.7	15.6		13.9	8.8	
PPG debt service-to-exports ratio (in percent)	8.8	8.4	9.5	8.8	12.7	11.7			6.2	5.0	4.4	4.0	3.8	3.0		3.3	3.7	
Total gross financing need (billions of U.S. dollars)	0.3	0.4	0.4	0.6	0.8	1.0			1.2	1.1	1.2	1.2	1.2	1.2		1.4	1.8	
Non-interest current account deficit that stabilizes debt ratio	3.7	5.5	-3.3	13.6	6.5	16.6			29.3	8.6	7.5	7.1	6.4	6.5		6.0	5.1	
Key macroeconomic assumptions																		
Real GDP growth (in percent)	3.2	4.6	0.7	6.7	5.6	5.5	4.4	2.0	3.3	5.6	5.6	5.2	5.0	5.0	4.9	5.0	5.0	5.0
GDP deflator in US dollar terms (change in percent)	-11.7	-0.5	8.9	19.6	10.4	2.6	1.9	9.5	3.4	4.8	2.8	2.5	2.3	2.6	3.1	1.8	1.9	1.8
Effective interest rate (percent) 5/	1.7	1.3	2.0	2.4	2.2	1.7	2.0	0.4	1.3	1.8	2.6	2.4	2.4	2.3	2.1	2.2	1.6	2.0
Growth of exports of G&S (US dollar terms, in percent)	-11.9	7.0	9.0	19.7	19.3	3.4	4.4	10.8	-3.8	13.8	10.1	9.2	9.0	9.2	7.9	7.2	7.7	7.5
Growth of imports of G&S (US dollar terms, in percent)	-3.3	5.5	13.1	27.7	20.1	13.0	7.8	11.4	10.4	6.9	5.4	7.2	7.1	8.0	7.5	6.9	6.9	7.0
Grant element of new public sector borrowing (in percent)	40.9	45.3	53.5	45.0	45.2	47.1	46.2	45.6	45.6	45.6
<i>Memorandum item:</i>																		
Nominal GDP (billions of US dollars)	4.7	4.9	5.4	6.8	8.0	8.6			9.2	10.2	11.1	11.9	12.8	13.8		19.3	37.5	

Source: Staff simulations.

1/ Includes both public and private sector external debt.

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); changes in gross foreign assets; and valuation adjustments. For projections also includes contribution from price and exchange rate changes.

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.

Table 2. Senegal: Sensitivity Analyses for Key Indicators of External PPG Debt, 2006-26 1/
(In percent)

	Projections							
	2006	2007	2008	2009	2010	2011	2016	2026
NPV of debt-to-GDP ratio								
Baseline	13	13	12	12	13	13	14	15
A. Alternative Scenario								
New public sector loans on less favorable terms in 2007-26 2/	13	14	15	16	17	18	24	34
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2007-08	13	13	13	13	14	14	15	16
B2. Export value growth at historical average minus one standard deviation in 2007-08 3/	13	17	24	24	24	24	24	21
B3. US dollar GDP deflator at historical average minus one standard deviation in 2007-08	13	14	16	16	16	16	18	19
B4. Net non-debt creating flows at historical average minus one standard deviation in 2007-08 4/	13	19	25	25	25	25	25	22
B5. Combination of B1-B4 using one-half standard deviation shocks	13	23	36	36	36	36	34	29
B6. One-time 30 percent nominal depreciation relative to the baseline in 2007 5/	13	18	17	17	18	18	20	22
NPV of debt-to-exports ratio								
Baseline	55	52	50	50	50	50	54	55
A. Alternative Scenario								
New public sector loans on less favorable terms in 2007-26 2/	55	57	60	64	68	72	93	121
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2007-08	55	52	50	50	50	50	54	55
B2. Export value growth at historical average minus one standard deviation in 2007-08 3/	55	85	139	137	134	132	128	108
B3. US dollar GDP deflator at historical average minus one standard deviation in 2007-08	55	52	50	50	50	50	54	55
B4. Net non-debt creating flows at historical average minus one standard deviation in 2007-08 4/	55	79	103	101	99	97	94	78
B5. Combination of B1-B4 using one-half standard deviation shocks	55	97	159	155	152	148	141	111
B6. One-time 30 percent nominal depreciation relative to the baseline in 2007 5/	55	52	50	50	50	50	54	55
Debt service ratio								
Baseline	6	5	4	4	4	3	3	4
A. Alternative Scenario								
New public sector loans on less favorable terms in 2007-26 2/	6	5	5	5	5	4	5	8
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2007-08	6	5	4	4	4	3	3	4
B2. Export value growth at historical average minus one standard deviation in 2007-08 3/	6	6	8	9	8	7	9	8
B3. US dollar GDP deflator at historical average minus one standard deviation in 2007-08	6	5	4	4	4	3	3	4
B4. Net non-debt creating flows at historical average minus one standard deviation in 2007-08 4/	6	5	6	6	6	5	6	6
B5. Combination of B1-B4 using one-half standard deviation shocks	6	6	8	9	9	8	10	8
B6. One-time 30 percent nominal depreciation relative to the baseline in 2007 5/	6	5	4	4	4	3	3	4
<i>Memorandum item:</i>								
Grant element assumed on residual financing (i.e., financing required above baseline) 6/	0	0	0	0	0	0	0	0
Source: Staff projections and simulations.								
1/ Stress-tests assume that shocks are fully financed by public sector on non-concessional terms, not by private sector.								
2/ Assumes that the interest rate on new borrowing is by 3.5 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 the alternative scenario (less favorable financing) in which the terms on all new financing are as specified in footnote 2.								

Table 3. Senegal: Total PPG Debt Sustainability Framework, Baseline Scenario, 2003-2026
(In percent of GDP, unless otherwise indicated)

	Actual			Historical Average 5/	Standard Deviation 5/	Estimate					Projections				
	2003	2004	2005			2006	2007	2008	2009	2010	2011	2006-11 Average	2016	2026	2012-26 Average
Public sector debt 1/	55.1	48.0	46.3			20.3	22.2	23.2	24.3	25.5	26.7		31.5	38.2	
o/w foreign-currency denominated	51.1	44.4	42.9			17.0	18.2	18.5	18.9	19.5	20.0		22.8	28.6	
Change in public sector debt	-13.4	-7.0	-1.7			-26.0	2.0	1.0	1.1	1.3	1.1		0.8	0.3	
Identified debt-creating flows	-13.9	-6.9	2.6			-24.3	1.7	1.3	1.3	1.4	1.1		0.9	0.3	
Primary deficit	0.5	1.8	2.4	-0.2	1.7	5.0	3.7	3.4	3.4	3.4	3.4	3.7	3.0	2.6	3.0
Revenue and grants	20.1	20.6	21.1			21.5	21.7	21.7	21.2	21.3	21.3		21.8	22.8	
of which : grants	2.0	2.1	1.7			1.8	1.8	1.8	1.8	1.8	1.8		1.8	1.8	
Primary (noninterest) expenditure	20.6	22.4	23.4			26.5	25.4	25.0	24.7	24.7	24.8		24.8	25.4	
Automatic debt dynamics	-13.2	-6.1	2.8			-4.8	-1.0	-1.0	-1.1	-1.1	-1.2	-1.7	-1.4	-1.9	-1.5
Contribution from interest rate/growth differential	-4.3	-3.1	-2.8			-1.9	-0.9	-0.9	-1.0	-1.0	-1.1		-1.4	-1.9	
of which : contribution from average real interest rate	0.0	-0.2	-0.3			-0.5	0.2	0.3	0.1	0.2	0.1		0.1	-0.1	
of which : contribution from real GDP growth	-4.3	-2.9	-2.5			-1.5	-1.1	-1.2	-1.1	-1.2	-1.2		-1.5	-1.8	
Contribution from real exchange rate depreciation	-8.9	-3.0	5.6			-2.9	-0.2	-0.1	-0.1	-0.1	-0.1		...	...
Other identified debt-creating flows	-1.1	-2.6	-2.6			-24.5	-1.0	-1.0	-1.0	-1.0	-1.2		-0.8	-0.4	
Privatization receipts (negative)	0.0	0.0	-0.1			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Recognition of implicit or contingent liabilities	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Debt relief (HIPC and other)	-1.1	-2.6	-2.5			-24.5	-1.0	-1.0	-1.0	-1.0	-1.2		-0.8	-0.4	
Other	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	-0.1	-4.3			-1.7	0.2	-0.3	-0.2	-0.1	0.0		0.0	0.1	
NPV of public sector debt	...	...	...			16.1	16.6	17.0	17.9	18.7	19.5		22.8	24.9	
o/w foreign-currency denominated	...	...	...			12.7	12.6	12.3	12.4	12.6	12.9		14.1	15.3	
o/w external	...	...	...			12.7	12.6	12.3	12.4	12.6	12.9		14.1	15.3	
NPV of contingent liabilities (not included in public sector debt)	...	...	...			...	...	...	...	...	...		...	...
Gross financing need 2/	2.8	6.4	6.4			8.0	6.8	6.6	7.7	8.7	9.3		11.2	11.8	
NPV of public sector debt-to-revenue ratio (in percent) 3/	...	...	...			74.7	76.3	78.5	84.1	87.9	91.4		104.7	109.0	
o/w external	...	...	...			59.2	57.9	56.8	58.6	59.5	60.3		64.7	67.2	
Debt service-to-revenue ratio (in percent) 3/ 4/	12.8	18.4	15.8			11.2	8.6	8.2	7.8	7.4	5.8		5.6	5.8	
Primary deficit that stabilizes the debt-to-GDP ratio	13.8	8.9	4.1			31.0	1.7	2.4	2.3	2.2	2.3		2.2	2.3	2.2
Key macroeconomic and fiscal assumptions															
Real GDP growth (in percent)	6.7	5.6	5.5	4.4	2.0	3.3	5.6	5.6	5.2	5.0	5.0	4.9	5.0	5.0	5.0
Average nominal interest rate on forex debt (in percent)	1.7	2.0	1.9	1.8	0.5	0.9	2.0	2.1	1.5	1.6	1.3	1.6	1.3	1.1	1.3
Average real interest rate on domestic currency debt (in percent)	2.0	3.2	0.7	0.2	2.3	9.8	6.7	6.7	5.1	4.4	4.3	6.1	2.5	1.3	2.2
Real exchange rate depreciation (in percent, + indicates depreciation)	-15.4	-6.3	13.5	1.9	12.1	-7.2	...	...	...	...	...	...	...	...	...
Inflation rate (GDP deflator, in percent)	-0.1	0.4	2.4	2.0	1.4	3.1	2.5	2.3	2.2	1.8	1.8	2.3	1.8	1.9	1.9
Growth of real primary spending (deflated by GDP deflator, in percent)	15.4	14.8	10.2	9.3	10.4	16.8	1.3	4.0	3.7	5.2	5.3	6.0	5.0	5.3	5.2
Grant element of new external borrowing (in percent)	...	...	...			40.9	45.3	53.5	45.0	45.2	47.1	46.2	45.6	45.6	45.6

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

1/ Public sector comprises central government. 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 including 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 4. Senegal: Sensitivity Analysis for Key Indicators of Total PPG Debt, 2006-2026

	Projections							
	2006	2007	2008	2009	2010	2011	2016	2026
NPV of Debt-to-GDP Ratio								
Baseline	16	17	17	18	19	20	23	25
A. Alternative scenarios								
Primary balance is unchanged from 2006	16	18	20	22	25	27	39	61
Permanently lower GDP growth 1/	16	17	17	19	20	21	29	46
B. Bound tests 4/								
B1. Real GDP growth is at historical average minus one standard deviations in 2007-2008	16	18	20	22	24	26	36	51
B2. Primary balance is at historical average minus one standard deviations in 2007-2008	16	14	13	14	15	16	19	21
B3. Combination of B1-B2 using one half standard deviation shocks	16	14	12	12	13	14	16	17
B4. One-time 30 percent real depreciation in 2007	16	21	21	21	22	22	24	23
B5. 10 percent of GDP increase in other debt-creating flows in 2007	16	27	27	28	28	29	32	34
NPV of Debt-to-Revenue Ratio 2/								
Baseline	75	76	79	84	88	91	105	109
A. Alternative scenarios								
Primary balance is unchanged from 2006	75	82	92	105	116	127	179	268
Permanently lower GDP growth 1/	75	77	80	88	93	99	131	200
B. Bound tests 4/								
B1. Real GDP growth is at historical average minus one standard deviations in 2007-2008	75	81	92	104	114	123	165	221
B2. Primary balance is at historical average minus one standard deviations in 2007-2008	75	66	60	66	70	73	87	93
B3. Combination of B1-B2 using one half standard deviation shocks	75	64	54	59	62	65	75	74
B4. One-time 30 percent real depreciation in 2007	75	97	96	100	102	103	109	102
B5. 10 percent of GDP increase in other debt-creating flows in 2007	75	122	124	130	134	137	149	149
Debt Service-to-Revenue Ratio 2/ 3/								
Baseline	11	9	8	8	7	6	6	6
A. Alternative scenarios								
Primary balance is unchanged from 2006	11	9	9	9	9	8	12	20
Permanently lower GDP growth 1/	11	9	8	8	8	6	7	13
B. Bound tests 4/								
B1. Real GDP growth is at historical average minus one standard deviations in 2007-2008	11	9	9	9	9	8	11	16
B2. Primary balance is at historical average minus one standard deviations in 2007-2008	11	9	8	6	6	4	4	4
B3. Combination of B1-B2 using one half standard deviation shocks	11	9	7	6	5	3	3	2
B4. One-time 30 percent real depreciation in 2007	11	9	9	8	8	7	7	7
B5. 10 percent of GDP increase in other debt-creating flows in 2007	11	9	12	12	12	10	10	10
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.								
3/ Excludes short-term debt service.								
4/ Assumes residual financing (i.e., financing required above baseline) is non-concessional with grant element equal to zero.								