INTERNATIONAL DEVELOPMENT ASSOCIATION
INTERNATIONAL MONETARY FUND

ANGOLA

Joint Bank-Fund Debt Sustainability Analysis

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

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Angola is assessed to remain at moderate risk of debt distress. *The projected deterioration in both external and fiscal positions in 2009 is likely to temporarily bring the external debt-to-GDP and debt service ratios above their indicative thresholds. However, going forward, the expected recovery in GDP growth alongside the projected rebound in oil revenues in the medium-term and higher non-oil revenues in the longer term will support a gradual and continuous decline in the debt ratios (in present value terms) below the thresholds. Compared to the 2007 DSA, while the debt dynamics in the short and medium terms have worsened, the debt's long-term path appears to be more comfortable. That said, Angola's heavy dependence on oil continues to pose vulnerabilities, particularly in light of the projected decline of oil production. In this regard, the examined alternative scenarios suggest that a failure to implement structural reforms geared toward the raising the non-oil sector's competitiveness is likely to reverse the progress achieved, leading to fast accumulation of public debt.*

I. BACKGROUND[1]

1. **This DSA reviews the evolution of Angola's public debt since the 2007 DSA[2] and project the debt path in light of recent economic developments.** Using the Bank–Fund debt sustainability framework (DSF), it projects the baseline economic scenario and performs various stress tests to assess whether debt distress will continue to be moderate. The

[1] The analysis includes only central government debt and guarantees; it excludes state-owned enterprises as well as the private sector external debt due to data limitations.

[2] World Bank report IDA/SecM2007-05555 and IMF Country Report 07/354.

thresholds for public external debt distress are those for countries like Angola with weak policies and institutions (Table 1).[3]

2. **The favorable external conditions in the past years facilitated sharp reduction in the debt ratios.** Improved external conditions and increased capacity of oil production led, in recent years, to large windfalls of oil revenues and to substantial fiscal and external current account surpluses. Together with the robust GDP growth, the buoyant oil revenues facilitated a reduction of the external debt-to-GDP ratio to 16 percent of GDP from 45 percent in 2004 and a rapid accumulation of international reserves to nearly 9 months of imports at end-2008. The high fiscal surpluses in recent years have limited the government's domestic borrowing requirement and allowed to keep the domestic debt contained at below 6 percent of GDP.

3. **The comfortable external environment also facilitated the clearance of external arrears and the normalization of relations with Paris Club.** In October 2007, the authorities reached an agreement with Paris Club creditors to pay US$1.8 billion in late interest while US$400 million of penalties were cancelled. The repayment of the arrears is planned to take place over three years where sums of US$800, US$600 and US$400 million will be paid in 2008, 2009 and 2010, respectively.[4]

4. **Although the external environment was broadly positive in the first half of 2008, Angola's macroeconomic outlook worsened significantly toward the end of the year.** The sharp fall of oil prices together with OPEC decision to cut oil production[5] are projected to reduce oil revenues significantly and shift the fiscal and the current account balances to large deficits in 2009. The fiscal deficit is planned to be partially financed by a drawdown of fiscal reserves at the BNA, yet the lion share of the financing is planned to be made through additional domestic and external borrowing. The increased government borrowing alongside the projected contraction of GDP (in both nominal and real terms) is likely to increase the external debt ratios substantially (Table 1).

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[3] Angola's score on the World Bank's Country Policy and Institutional Assessment (CPIA) was upgraded in 2007 from 2.65 to 2.73. However, its average in 2005-07 is 2.66, below the 3.25 floor for medium performers.

[4] Alongside the relation normalization with Paris Club, Angola has changed its financing strategy. Until recently, the government relied primarily on expensive oil-back loans from international banks, contracted by the national oil company (Sonangol) to cover its financing needs. These loans have been paid off and Angola now relies on foreign credit lines from the Chinese Eximbank and other export-credit agencies.

[5] According to OPEC decision in December 2008, Angola's oil production will be cut by 244,000 barrels per day to 1.65 million barrels per day.

Table 1. Angola : Indicative External Debt Ratios

		Baseline scenario			
	Thresholds[1]	2008	2009	2019	2029
PV of debt in percent of:					
GDP	30	29.7	39.3	21.1	12.0
Exports	100	37.8	88.7	69.6	73.5
Revenues	200	62.3	113.9	74.2	67.8
Debt service in percent of:					
Exports	15	2.9	24.8	14.1	10.6
Revenues	25	4.7	31.8	15.0	9.8

Source: BNA and staff estimates.

[1]Based on Angola's 2005-07 classification as a weak performer.

II. THE BASELINE MACROECONOMIC ASSUMPTIONS

5. **Two main forces guide the baseline scenario:** (i) a gradual decline in oil production in tandem with an expansion of the non-oil sector. The latter implies a continued progress in implementing structural reforms aimed at raising the competitiveness of the non-oil sector; and (ii) a continued fiscal adjustment toward a sustainable fiscal position, which will be reflected in a gradual decline in the non-oil primary deficit as a share of non-oil GDP. The baseline scenario also assumes a strengthening of the monetary policy framework that will facilitate a gradual decline of inflation to low single digit level. The key macroeconomic assumptions of the baseline scenario are in Box 1. These assumptions are similar to those used in the 2007 DSA with a few exceptions that are outlined below:

- In light of the recent OPEC decision and the recent technical delays in oil production, the current oil production is assumed to be operating below capacity. Thus, the current scenario assumes that the projected decline in oil production beyond the medium term will be more moderate compared to the 2007 baseline scenario.

- Under the current baseline scenario, oil prices in the medium term (2009-2014) are projected at 7 percent below the 2007 DSA path while in the longer term (2015-2029) oil prices are projected at 9 percent above the 2007 DSA baseline.

- The projection of lower oil prices in the short and medium terms combined with lower oil production in 2009 and 2010 are likely to result in sizable fiscal deficits compared to the projected fiscal surpluses in the 2007 DSA. Over the longer term, both DSA exercises project fiscal deficits, although at slightly different magnitudes (Box 1).

Box 1. Macroeconomic assumptions in the Baseline Scenario

Real GDP is projected to grow at about 5.8 percent a year in 2009-14 and remain at this pace throughout the projection period. This rate largely reflects the expectation that the oil production will peak at 2014 and gradually decline thereafter while the growth of the non-oil sector will decelerate slightly but remain strong. Over the long term, the baseline scenario assumes that the share of the non-oil sector in the overall GDP will increase from 40 percent in 2008 to around 90 percent in 2029.

Inflation is projected to gradually decline toward the low single digit level in line with the authorities' goal of meeting the SADC convergence criteria. This will be facilitated by a prudent monetary policy geared toward achieving price stability. This scenario also assumes greater flexibility in exchange rate that is expected to facilitate gradual appreciation in the medium term.

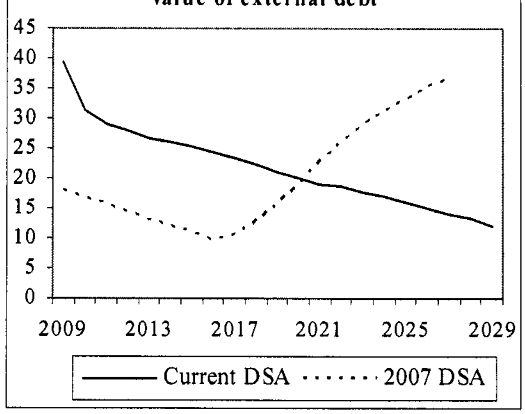
Box Table 1. Key Trends

		2009-2014		2015-2029[1]	
	Historical average	2007 DSA	Current DSA	2007 DSA	Current DSA
Real GDP growth	11.3	5.5	5.8	4.8	5.5
GDP deflator (percent; in US terms)	17.2	3.8	2.0	1.4	3.7
Primary fiscal balance (percent of GDP)	2.9	3.5	3.8	-2.3	2.4
Non-interest external current account balance (percent of GDP; excluding grants)	10.4	0.1	3.1	-6.5	0.5
Exports growth (percent; US$ terms)	35.8	-1.4	1.2	4.4	3.1
Import growth (percent; US$ terms)	23.4	7.1	6.7	6.7	4.1
Public sector debt (percent of GDP)	91.9	13.4	32.5	12.8	25.4
Of which: foreign currency debt	91.0	11.6	29.2	10.9	24.1

1/ The figures for the 2007 DSA refer to the period 2015-2027.

The fiscal stance is projected to deteriorate substantially in 2009 as the sharp decline in oil revenues is expected to shift the fiscal balance to a deficit of 12 percent of GDP after recording a fiscal surplus of the same magnitude in the previous year. In the medium term and beyond, the fiscal stance is projected to improve on the back of higher revenues and prudent public spending and record small surpluses. In the long term (from 2022 onwards), in light of the projected decline in oil production, these surpluses are projected to revert to small deficits, which will be financed by both domestic and external borrowing. The non-oil primary deficit is projected to be halved by 2013 from 61 percent of non-oil GDP in 2008 and continue its downward path to below 10 percent in 2029.

Box figure 1: Angola: The present value of external debt



The external current account is projected to sharply deteriorate in 2009 due to significant contraction of oil exports. Consequently, the current account is projected to shift to a deficit of 10 percent of GDP after recording double-digit surpluses in the past years. In the medium term, the external position is expected to somewhat improve given the projected recovery in economic activity; nevertheless, in the longer term, the current account will shift back to small deficits as oil production shrinks. The financing of the current account deficits is assumed to come mainly from non-debt creating FDI flows.

III. BASELINE SCENARIO

External debt sustainability

6. **Although the debt indicators are projected to significantly worsen in 2009, the external debt dynamics remain favorable throughout the forecast horizon (Table 3 and Figure 1).** The contraction of GDP and the large financing needs are projected to bring in 2009 the present value (PV) of the external debt to 39 percent of GDP, which is above its indicative threshold. However, improved economic conditions, particularly the projected rebound in oil revenues, are expected to strengthen the fiscal stance and contain the budget financing needs from 2010 onward. Together with the projected strong growth of the non-oil sector, the PV of external debt is expected to record a gradual decline and reach 21 percent of GDP in 2019 and 12 percent in 2029. This path differs from the 2007, which envisaged a gradual increase in the external debt ratios over the long term mainly due to weaker fiscal and external positions. The present value of debt service in terms of exports is projected to evolve for several years around its indicative threshold of 15 percent of GDP and, from 2019 onwards, it is projected to gradually decline and reach 11 percent of GDP in 2029 on the back of higher non-oil exports.

7. **The risk of external debt distress appears to be moderate.**[6] While under most of the standardized stress tests (Table 3a), the debt burden indicators decline below their thresholds values throughout the next 20 years, in a customized stress test, where exports receipts decline sharply due to an intensification of the recent oil price shock,[7] the debt burden indicators are shifted to an unsustainable path where the present value of external debt reaches 123 percent of GDP in 2029. This exercise illustrates the risks associated with the recent high volatility in oil prices and underscores the importance of diversifying sources of growth and reducing the heavy dependence on oil.

Public debt sustainability

8. **The baseline scenario shows that the public debt will renew its downward path following some deterioration in the short and medium term (Table 4).** The substantial increase in government borrowing is projected to increase the public debt to 33 percent of GDP in 2009. The public debt is projected to remain elevated over the medium term, yet, with an improved fiscal stance and higher GDP growth, it is projected to decline gradually

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[6] The staff Guidance Note on the Application of the Joint Bank-Fund Debt Sustainability Framework for Low Income Countries (SecM2007-0226 and SM/07/131) defines a "moderate risk of debt distress" when: "alternative scenarios or stress tests result in a significant rise in debt-service indicators over the projection period, the nearing or breaching of debt or debt-service thresholds, even though the baseline scenario does not indicate a breach of the relevant thresholds."

[7] The exercise of "oil price shock" envisages a further decline of 20 percent in oil prices in 2010 and 2011.

from 2016 onward and reach 20 percent in 2029. In present value terms, debt is projected to maintain a downward path from 2010 onwards and reach 17 percent at the end of the forecast horizon. This scenario differs from the path of public debt in the 2007 DSA[8] mainly due to higher projected path of oil prices in long term, which is assumed to result in a lower government borrowing requirement.

9. **Sensitivity analysis suggests that temporarily low growth may lead to unsustainable path of the public debt.** In this regard, a decline in GDP growth to 4 percent[9] in both 2010 and 2011 without a complementary fiscal adjustment would lead to a rapid accumulation of debt such that the present value of public debt would mount to around 56 percent in 2029. Under this scenario, which can be viewed as a protracted global recession that entails a continuation of oil production cuts by OPEC as well as sharp decline in capital inflows, the present value of the public debt in terms of revenues is projected to climb up exponentionally and reach 350 percent in 2029 (table 4a).

IV. ALTERNATIVE SCENARIOS

10. **Two alternative scenarios were developed to assess Angola's vulnerability to debt distress.** The first alternative scenario assumes permanently lower GDP growth rates, which reflect insufficient implementation of structural reforms geared toward improving the competitiveness of the non-oil sector. The second scenario assumes weak fiscal adjustment that represents a permanent lower path of oil revenues alongside scaled-up infrastructure and social spending. The results of this exercise highlights the risks associated with mismanaging possible revenue shortfalls.

A. Permanently lower GDP growth

11. **With insufficient implementation of structural reforms and slower expansion of the non-oil sector, the GDP growth rate throughout the forecast period is assumed to be 2 percent lower than in the baseline.**[10] Under this scenario, the non-oil exports over the longer term would be lower (compared to the baseline) and thus lead to substantial and persistent external current account deficits, which are projected to reach 5.5 percent of GDP toward the end of the forecast horizon. As capital inflow, notably foreign direct investment to the non-oil sector, would also decline, the larger part of the current account deficits would be financed by external borrowing. Consequently, while the present value of the external public

[8] The 2007 DSA projected a continuous decline in the public debt up to 2019 and from then a moderate increase due to a deterioration of the fiscal stance.

[9] This growth rate derives from the 10-year historical average minus one standard deviation.

[10] The impact of the insufficient implementation of structural reforms on output growth and on the external stance is assumed to take effect from 2015 throughout the forecast horizon.

debt is projected to rise, yet still remain under the threshold in 2029 (reaching 20.3 percent of GDP), the debt's present value as a percent of exports is projected to breach its indicative threshold and reach 155 percent compared to 74 percent in the baseline scenario (Table 2).

12. **This scenario also shows that the public debt would substantially increase (Table 2).** As a result of lower output growth, the non-oil revenues are projected to decline and weaken the fiscal stance further. Assuming that the widening deficits will be financed by both domestic and external borrowing, the present value of the public debt is projected to mount to 44 percent of GDP (compared to 16 percent in the baseline) while the present value of debt service-to-revenue ratio is projected to breach its threshold of 200 percent in 2019 and continue upward thereafter. Not surprisingly, under this scenario, a temporary fiscal shock to the primary balance (higher level of expenditures) would steepen the upward trend such that the public debt would exceed 50 percent of GDP in 2029.

Table 2. Angola : External Debt Sustainability Indicators under Alternative Scenarios

	Thresholds[1]	2009	2019	2029
			Baseline	
PV of debt-to-GDP ratio	30	39.3	21.1	12.0
PV of debt-to-exports ratio	100	88.7	69.6	73.5
PV of debt service-to-exports	15	24.8	14.1	10.6
			Low GDP growth	
PV of debt-to-GDP ratio		39.3	32.9	20.3
PV of debt-to-exports ratio		88.7	115.5	154.6
PV of debt service-to-exports		24.8	17.1	17.0
			Weak fiscal adjustment	
PV of debt-to-GDP ratio		44.9	53.5	45.2
PV of debt-to-exports ratio		101.3	184.6	290.0
PV of debt service-to-exports		25.5	20.5	22.4

Source: BNA and staff estimates.
[1]Based on Angola's 2005-07 classification as a weak performer.

B. Weak fiscal adjustment

13. **Under the weak fiscal adjustment, the fiscal stance is assumed to deteriorate faster than projected in the baseline scenario as public spending remains ambitious despite lower oil revenues.** In particular, this scenario assumes lower trajectory of oil prices while capital expenditures increase by 5 percent in real terms per annum.[11] Consequently, the primary fiscal balance would rapidly deteriorate, and by 2014, the present value of the external and domestic debt would build up to 51 percent of GDP and 19 percent of GDP,

[11] This scenario assumes an oil price path that is 20 percent lower than in the baseline's path, and uses the 2009 budget as a starting point for capital spending.

respectively. Over the longer term, in light of the declining share of oil revenues in total revenues and given the expectation that the non-oil sector would strongly expand, the primary fiscal deficit is projected to contract gradually to 4 percent of GDP. Thus, while in 2029, the present value of the external and domestic debt is projected to moderate to around 45 percent of GDP and 10 percent of GDP, respectively, the present value of external debt in percent of exports is projected to continue its upward path and record 290 percent at the end of the forecast period (Table 2).

V. Conclusions

14. **The debt sustainability analysis indicates that Angola remains at moderate risk of debt distress.** While the projected deterioration in the fiscal and external positions in 2009 is likely to elevate the debt-to-GDP ratio and debt service ratios above their thresholds, the expected recovery in oil revenues and economic growth from 2010 onward are projected to renew the debt's downward path below the thresholds throughout the forecast horizon. That said, these projections need to be taken with some caution given the limited information on the outstanding external debt and future disbursements, particularly of the state-own enterprises and the private sector, and the high uncertainty regarding the future path of oil prices. At the same time, it is worth noting that future discoveries of oil and gas reserves are likely to improve the fiscal and external positions and facilitate faster decline in the debt ratios.

15. **The alternative scenarios demonstrate the need to keep sound fiscal management, particularly in light of the recent high volatility of oil prices, which strongly affect the public finance**. In this vein, it would be highly instrumental to move ahead with important structural reforms geared toward raising the competitiveness of the non-oil sector so as to reduce Angola's external vulnerabilities and to preserve the debt sustainability.

Table 3.: External Debt Sustainability Framework, Baseline Scenario, 2006-2029 1/
(In percent of GDP, unless otherwise indicated)

	Actual			Historical 0	Standard	Projections									
	2006	2007	2008	Average 0	Deviation	2009	2010	2011	2012	2013	2014	2009-2014 Average	2019	2029	2015-2025 Average
External debt (nominal) 1/	**16.8**	**16.2**	**16.1**			**25.1**	**23.4**	**24.5**	**26.6**	**27.5**	**28.4**		**26.4**	**14.7**	
o/w public and publicly guaranteed (PPG)	16.8	16.2	16.1			25.1	23.4	24.5	26.6	27.5	28.4		26.4	14.7	
Change in external debt	-16.9	-0.6	-0.2			9.1	-1.7	1.0	2.1	0.9	0.9		-1.2	-1.6	
Identified net debt-creating flows	-33.9	-16.8	-15.6			4.4	-6.5	-6.2	-4.2	-6.2	-7.1		-4.0	-2.4	
Non-interest current account deficit	**-26.4**	**-16.9**	**-22.1**	**-10.4**	**12.4**	**5.0**	**-5.3**	**-5.2**	**-4.3**	**-4.5**	**-4.3**	-3.1	**-1.0**	**1.3**	-0.5
Deficit in balance of goods and services	-37.8	-31.1	-36.4			-5.7	-4.3	-5.6	-5.8	-5.0	-3.6		-4.0	1.0	
Exports	73.8	75.4	78.6			44.3	47.6	47.4	46.7	43.3	39.6		30.1	16.3	
Imports	36.1	44.4	42.2			38.6	43.3	41.8	40.9	38.3	36.0		26.1	17.2	
Net current transfers (negative = inflow)	0.4	0.4	0.3	-0.2	0.5	0.4	0.2	0.2	0.2	0.2	0.2		0.1	0.0	0.1
o/w official	0.4	0.4	0.3			0.4	0.2	0.2	0.2	0.2	0.2		0.1	0.0	
Other current account flows (negative = net inflow)	10.9	13.7	14.0			10.3	-1.3	0.1	1.4	0.3	-0.9		2.8	0.2	
Net FDI (negative = inflow)	**2.1**	**3.0**	**10.2**	**-10.0**	**16.0**	**-6.3**	**-2.5**	**-2.9**	**-2.0**	**-3.1**	**-3.9**		**-2.8**	**-3.2**	-3.4
Endogenous debt dynamics 2/	**-9.6**	**-2.9**	**-3.8**			**5.7**	**1.3**	**1.9**	**2.1**	**1.4**	**1.1**		**-0.2**	**-0.5**	
Contribution from nominal interest rate	1.2	1.1	0.9			5.0	3.8	3.4	3.4	3.0	2.7		1.3	0.5	
Contribution from real GDP growth	-4.2	-2.6	-1.7			0.7	-2.5	-1.5	-1.3	-1.6	-1.6		-1.4	-1.0	
Contribution from price and exchange rate changes	-6.6	-1.4	-3.0			...	...	...	...	...	...		...	...	
Residual (3-4) 3/	**17.0**	**16.2**	**15.5**			**4.7**	**4.7**	**7.3**	**6.2**	**7.2**	**8.0**		**2.8**	**0.8**	
o/w exceptional financing	3.5	0.2	-1.2			-1.3	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
PV of external debt 4/	...	...	29.7			39.3	31.4	28.9	28.1	26.8	25.9		21.0	12.0	
In percent of exports	...	...	37.8			88.7	66.1	61.1	60.2	61.9	65.4		69.6	73.5	
PV of PPG external debt	...	...	**29.7**			**39.3**	**31.4**	**28.9**	**28.1**	**26.8**	**25.9**		**21.0**	**12.0**	
In percent of exports	...	...	**37.8**			**88.7**	**66.1**	**61.1**	**60.2**	**61.9**	**65.4**		**69.6**	**73.5**	
In percent of government revenues	...	...	**62.3**			**113.9**	**86.6**	**77.8**	**76.6**	**73.9**	**73.9**		**74.2**	**67.8**	
Debt service-to-exports ratio (in percent)	**8.7**	**13.4**	**2.9**			**24.8**	**17.3**	**15.9**	**16.6**	**16.0**	**16.4**		**14.1**	**10.6**	
PPG debt service-to-exports ratio (in percent)	**8.7**	**13.4**	**2.9**			**24.8**	**17.3**	**15.9**	**16.6**	**16.0**	**16.4**		**14.1**	**10.6**	
PPG debt service-to-revenue ratio (in percent)	**13.9**	**21.5**	**4.7**			**31.8**	**22.6**	**20.2**	**21.1**	**19.0**	**18.5**		**15.0**	**9.8**	
Total gross financing need (Billions of U.S. dollars)	-8.1	-2.3	-8.0			6.3	0.4	-0.6	1.6	-0.8	-2.2		0.8	-0.8	
Non-interest current account deficit that stabilizes debt ratio	-9.5	-16.4	-21.9			-4.0	-3.6	-6.3	-6.3	-5.4	-5.2		0.1	2.8	
Key macroeconomic assumptions															
Real GDP growth (in percent)	18.6	20.3	14.8	11.3	7.5	-3.6	12.8	7.1	5.7	6.6	6.2	5.8	5.7	6.7	5.5
GDP deflator in US dollar terms (change in percent)	24.4	9.1	22.6	17.2	16.0	-19.5	15.7	7.1	2.5	3.8	2.4	2.0	3.4	6.3	3.7
Effective interest rate (percent) 5/	5.3	8.3	7.8	5.8	1.6	24.1	19.6	16.6	15.2	12.3	10.6	16.4	5.1	3.3	4.5
Growth of exports of G&S (US dollar terms, in percent)	37.3	34.1	46.6	35.8	25.0	-56.2	40.3	14.3	6.8	2.6	-0.6	1.2	-0.6	5.0	3.1
Growth of imports of G&S (US dollar terms, in percent)	7.6	61.5	33.7	23.4	18.4	-28.9	46.5	10.8	5.9	3.8	2.2	6.7	3.0	7.4	4.1
Grant element of new public sector borrowing (in percent)	...	...	...	...	...	9.6	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.6	9.6
Government revenues (*excluding grants, in percent of GDP*)	46.4	46.7	47.6			34.5	36.3	37.2	36.7	36.3	35.0		28.2	17.6	24.9
Aid flows (in Billions of US dollars) 7/	0.0	0.0	0.0			1.3	1.6	1.7	1.7	1.7	1.8		2.0	2.3	
o/w Grants	0.0	0.0	0.0			0.0	0.1	0.1	0.1	0.1	0.1		0.1	0.0	
o/w Concessional loans	0.0	0.0	0.0			1.3	1.5	1.6	1.6	1.6	1.7		1.9	2.3	
Grant-equivalent financing (in percent of GDP) 8/	...	...	...			0.6	0.7	0.6	0.6	0.5	0.5		0.4	0.1	0.3
Grant-equivalent financing (in percent of external financing) 8/	...	...	...			9.8	11.6	11.5	11.4	11.4	11.4		11.3	9.7	11.1
Memorandum items:															
Nominal GDP (Billions of US dollars)	45.2	59.3	83.4			64.8	84.6	97.0	105.2	116.4	126.6		192.8	483.2	
Nominal dollar GDP growth	47.5	31.2	40.7			-22.3	30.6	14.7	8.4	10.7	8.7	8.5	9.3	13.4	9.3
PV of PPG *external debt (in Billions of US dollars)*			24.8			25.4	26.6	28.1	29.6	31.2	32.7		40.4	57.8	
(PVt-PVt-1)/GDPt-1 (in percent)						0.8	1.8	1.8	1.5	1.6	1.3	1.5	0.7	0.3	0.8

Source: Staff simulations.

1/ Includes both public and private sector external debt.

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

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

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

5/ Current-year interest payments divided by previous period debt stock.

6/ Historical averages and standard deviations are generally derived over the past 10 years, subject to data availability.

7/ Defined as grants, concessional loans, and debt relief.

8/ Grant-equivalent financing includes grants provided directly to the government and through new borrowing (difference between the face value and the PV of new debt).

Table 3a.Angola: Sensitivity Analysis for Key Indicators of Public and Publicly Guaranteed External Debt, 2009-2029
(In percent)

	Projections							
	2009	2010	2011	2012	2013	2014	2019	2029
PV of debt-to GDP ratio								
Baseline	39	31	29	28	27	26	**21**	12
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2009-2029 1/	39	22	9	-3	-11	-18	**-43**	-62
A2. New public sector loans on less favorable terms in 2009-2029 2	39	33	32	32	31	31	**29**	20
A.3 Permanently lower growth	39	31	29	28	27	26	**33**	20
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2010-2011	39	34	33	32	31	29	**24**	14
B2. Export value growth at historical average minus one standard deviation in 2010-2011 3/	39	41	48	47	44	43	**30**	13
B3. US dollar GDP deflator at historical average minus one standard deviation in 2010-2011	39	36	35	34	32	31	**25**	14
B4. Net non-debt creating flows at historical average minus one standard deviation in 2010-2011 4/	39	40	45	44	41	40	**28**	13
B5. Combination of B1-B4 using one-half standard deviation shocks	39	42	41	40	38	36	**27**	13
B6. One-time 30 percent nominal depreciation relative to the baseline in 2010 5/	39	42	39	38	36	35	**28**	16
B.7 Oil price shock	39	45	56	58	61	68	**87**	123
PV of debt-to-exports ratio								
Baseline	89	66	61	60	62	65	**70**	74
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2009-2029 1/	89	47	20	-6	-26	-45	**-142**	-382
A2. New public sector loans on less favorable terms in 2009-2029 2	89	69	66	68	73	79	**95**	124
A.3 Permanently lower growth	89	63	59	59	62	69	**116**	155
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2010-2011	89	66	61	60	62	65	**70**	74
B2. Export value growth at historical average minus one standard deviation in 2010-2011 3/	89	109	133	131	134	141	**129**	103
B3. US dollar GDP deflator at historical average minus one standard deviation in 2010-2011	89	66	61	60	62	65	**70**	74
B4. Net non-debt creating flows at historical average minus one standard deviation in 2010-2011 4/	89	83	95	93	96	101	**94**	78
B5. Combination of B1-B4 using one-half standard deviation shocks	89	89	84	82	84	89	**87**	80
B6. One-time 30 percent nominal depreciation relative to the baseline in 2010 5/	89	66	61	60	62	65	**70**	74
B.7 Oil price shock	89	118	147	124	142	171	**287**	755
PV of debt-to-revenue ratio								
Baseline	114	87	78	77	74	74	**74**	68
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2009-2029 1/	114	61	25	-8	-32	-51	**-152**	-352
A2. New public sector loans on less favorable terms in 2009-2029 2	114	90	85	87	87	89	**102**	114
A.3 Permanently lower growth	114	83	75	76	75	76	**159**	306
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2010-2011	114	95	89	87	84	84	**85**	77
B2. Export value growth at historical average minus one standard deviation in 2010-2011 3/	114	113	129	127	122	122	**106**	73
B3. US dollar GDP deflator at historical average minus one standard deviation in 2010-2011	114	99	94	93	89	89	**90**	82
B4. Net non-debt creating flows at historical average minus one standard deviation in 2010-2011 4/	114	109	121	119	114	114	**100**	72
B5. Combination of B1-B4 using one-half standard deviation shocks	114	114	110	108	104	104	**96**	76
B6. One-time 30 percent nominal depreciation relative to the baseline in 2010 5/	114	117	105	103	100	100	**100**	91
B.7 Oil price shock	114	123	150	158	169	193	**306**	696

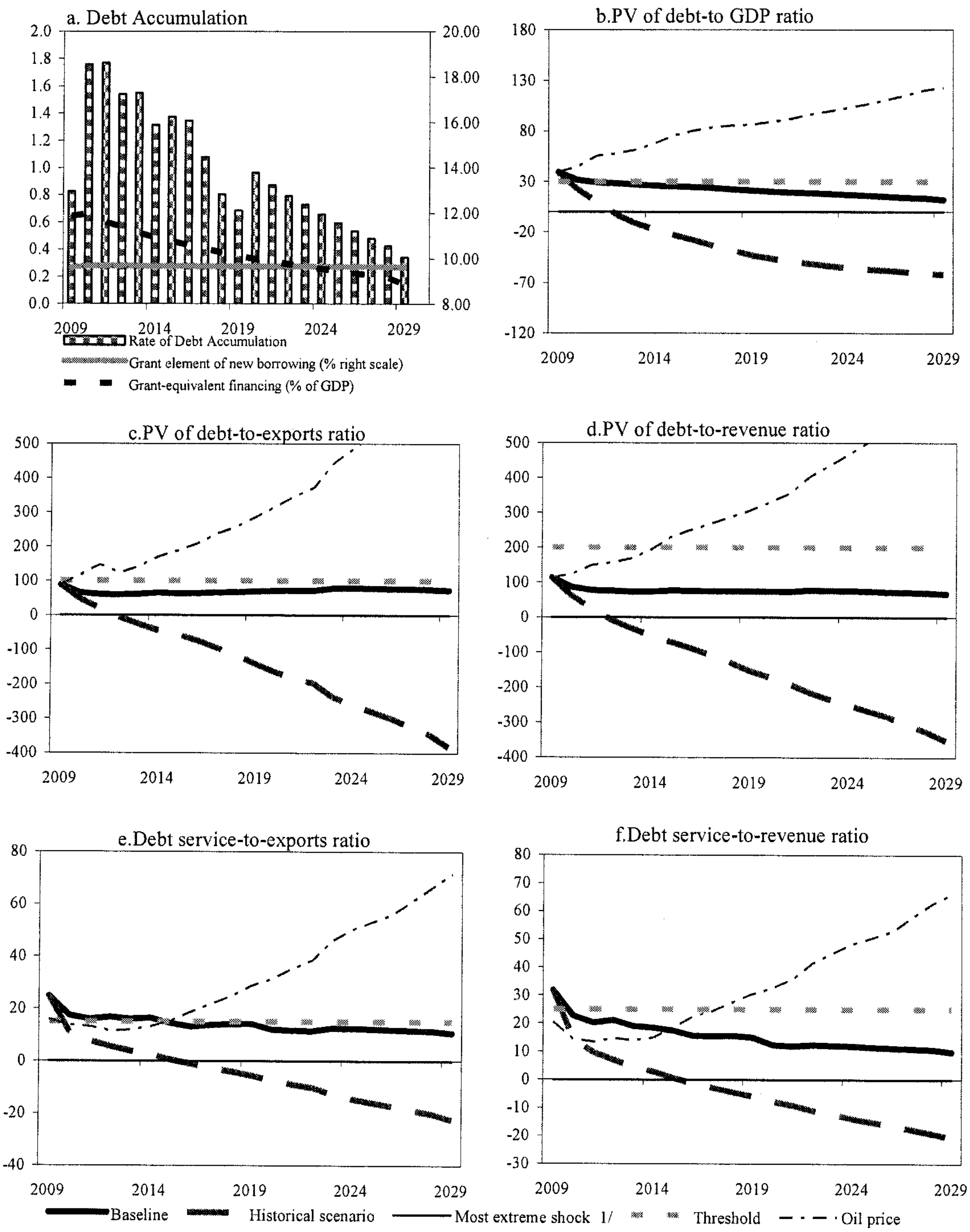
Table 3a.Angola: Sensitivity Analysis for Key Indicators of Public and Publicly Guaranteed External Debt, 2009-2029 (continued)
(In percent)

Debt service-to-exports ratio								
Baseline	25	17	16	17	16	16	**14**	11
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2009-2029 1/	25	11	8	6	4	2	-6	-23
A2. New public sector loans on less favorable terms in 2009-2029 2	25	11	9	9	8	8	6	6
A.3 Permanently lower growth	25	16	15	16	16	17	17	17
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2010-2011	25	11	9	9	9	10	11	10
B2. Export value growth at historical average minus one standard deviation in 2010-2011 3/	25	14	13	14	14	15	21	15
B3. US dollar GDP deflator at historical average minus one standard deviation in 2010-2011	25	11	9	9	9	10	11	10
B4. Net non-debt creating flows at historical average minus one standard deviation in 2010-2011 4/	25	11	10	11	10	11	15	11
B5. Combination of B1-B4 using one-half standard deviation shocks	25	12	10	10	10	11	14	11
B6. One-time 30 percent nominal depreciation relative to the baseline in 2010 5/	25	11	9	9	9	10	11	10
B.7 Oil price shock	16	14	13	12	12	13	29	72
Debt service-to-revenue ratio								
Baseline	32	23	20	21	19	18	**15**	10
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2009-2029 1/	32	14	10	7	4	3	-6	-21
A2. New public sector loans on less favorable terms in 2009-2029 2	32	14	12	12	10	9	6	6
A.3 Permanently lower growth	32	22	20	21.	19	19	24	34
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2010-2011	32	16	14	13	12	12	13	11
B2. Export value growth at historical average minus one standard deviation in 2010-2011 3/	32	14	13	14	13	13	17	11
B3. US dollar GDP deflator at historical average minus one standard deviation in 2010-2011	32	16	14	14	13	13	14	11
B4. Net non-debt creating flows at historical average minus one standard deviation in 2010-2011 4/	32	14	13	13	13	13	16	10
B5. Combination of B1-B4 using one-half standard deviation shocks	32	16	14	14	13	13	15	11
B6. One-time 30 percent nominal depreciation relative to the baseline in 2010 5/	32	19	16	16	15	15	15	13
B.7 Oil price shock	20	14	13	15	14	15	31	66
Memorandum item:								
Grant element assumed on residual financing (i.e., financing required above baseline) 6/	5	5	5	5	5	5	5	5

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 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.

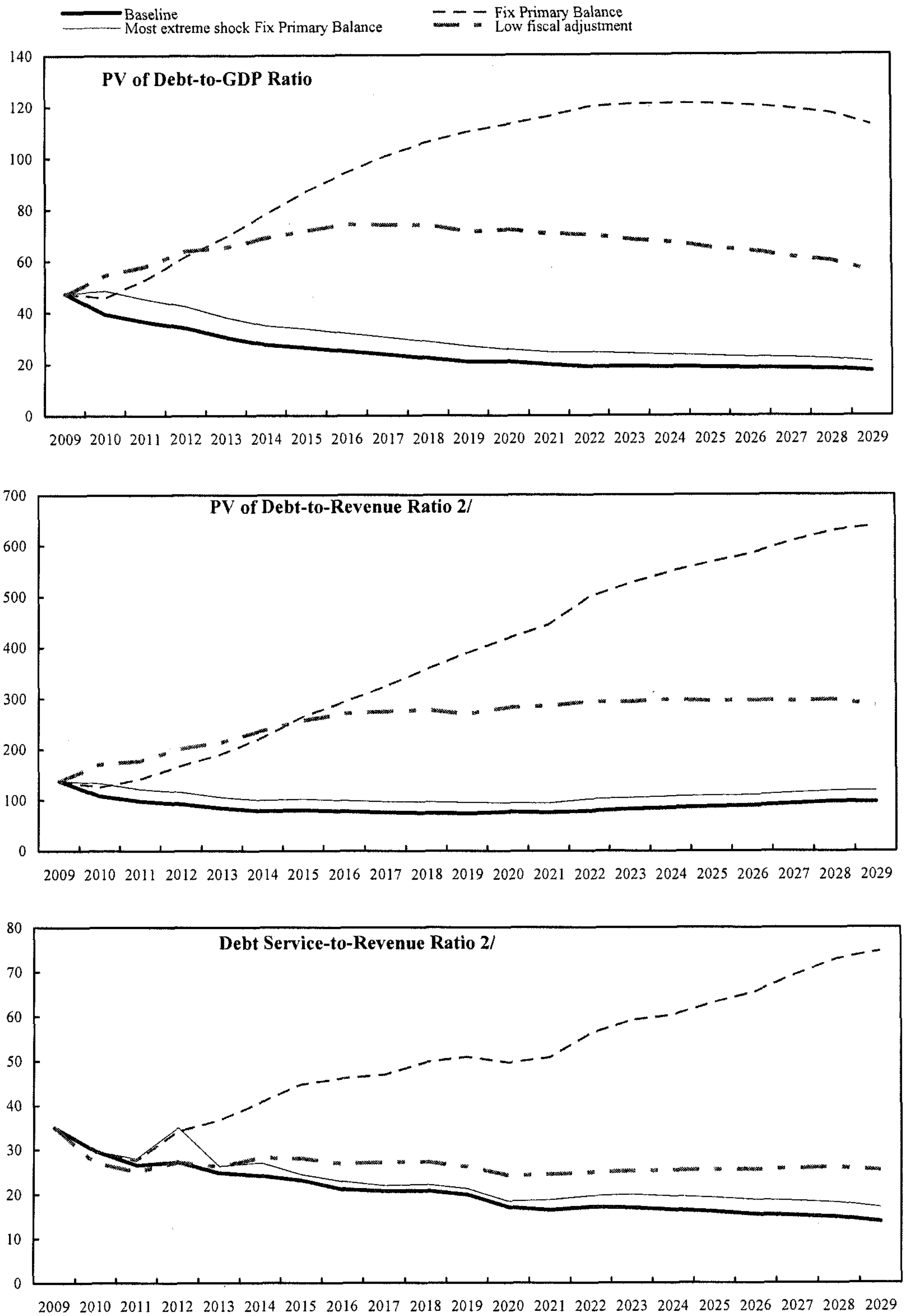
Figure 1. Angola: Indicators of Public and Publicly Guaranteed External Debt under Alternatives Scenarios, 2009-2029 1/



Source: Staff projections and simulations.

1/ The most extreme stress test is the test that yields the highest ratio in 2019. In figure b. it corresponds to a oil shock shock; in c. to a oil shock shock; in d. to a oil shock shock; in e. to a oil shock shock and in picture f. to a oil shock shock

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



Sources: Country authorities; and Fund staff estimates and projections.
1/ The most extreme stress test is the test that yields the highest ratio in 2019.
2/ Revenues are defined inclusive of grants.

Table 4. Angola: Public Sector Debt Sustainability Framework, Baseline Scenario, 2006-2029
(In percent of GDP, unless otherwise indicated)

	Actual					Estimate						Projections			
	2006	2007	2008	Average	Standard Deviation	2009	2010	2011	2012	2013	2014	2009-14 Average	2019	2029	2015-29 Average
Public sector debt 1/	19.3	17.8	21.9			33.5	31.5	31.9	32.5	31.1	30.0		26.3	19.9	
o/w foreign-currency denominated	18.0	16.9	19.0			29.1	27.3	28.4	29.7	29.3	29.2		26.4	17.3	
Change in public sector debt	-15.1	-1.4	4.1			11.6	-2.0	0.4	0.6	-1.4	-1.1		-1.3	-1.2	
Identified debt-creating flows	-24.5	-16.4	-17.3			17.9	-2.0	-2.6	-3.6	-6.3	-6.2		-3.2	0.5	
Primary deficit	-16.5	-13.0	-14.5	-2.9	11.5	6.1	-0.7	-5.1	-6.8	-7.9	-8.3	-3.8	-3.5	1.8	-1.4
Revenue and grants	46.4	46.7	47.6			34.5	36.4	37.3	36.8	36.3	35.1		28.3	17.6	
of which: grants	0.0	0.0	0.0			0.0	0.1	0.1	0.1	0.1	0.1		0.1	0.0	
Primary (noninterest) expenditure	29.9	33.8	33.1			40.6	35.7	32.3	30.1	28.5	26.7		24.7	19.5	
Automatic debt dynamics	-7.6	-3.4	-2.8			11.8	-1.3	2.5	3.1	1.5	2.1		0.3	-1.3	
Contribution from interest rate/growth differential	-4.6	-2.2	-0.3			6.3	2.4	3.1	3.4	2.5	2.3		0.7	-0.6	
of which: contribution from average real interest rate	0.8	1.1	2.0			5.5	6.2	5.2	5.1	4.5	4.1		2.2	0.8	
of which: contribution from real GDP growth	-5.4	-3.3	-2.3			0.8	-3.8	-2.1	-1.7	-2.0	-1.8		-1.5	-1.3	
Contribution from real exchange rate depreciation	-3.0	-1.2	-2.4			5.5	-3.7	-0.6	-0.2	-1.0	-0.1		...	...	
Other identified debt-creating flows	-0.4	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Privatization receipts (negative)	0.0	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	
Debt relief (HIPC and other)	-0.4	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Other (specify, e.g. bank recapitalization)	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Residual, including asset changes	9.4	14.9	21.3			-6.3	0.0	3.0	4.2	4.9	5.0		1.9	-1.7	
Other Sustainability Indicators															
PV of public sector debt	58.4	43.8	35.6			47.4	39.4	36.5	34.1	30.4	27.5		20.9	17.1	
o/w foreign-currency denominated	57.2	42.8	32.6			42.9	35.2	32.9	31.3	28.6	26.7		20.9	14.5	
o/w external	55.9	41.8	29.7			38.5	31.0	29.4	28.5	26.8	25.9		21.0	12.0	
PV of contingent liabilities (not included in public sector debt)	...	...	...			...	...	...	...	...	...		...	...	
Gross financing need 2/	-0.6	-9.6	-2.6			-11.0	18.5	10.2	4.8	3.3	1.2		1.7	5.1	
PV of public sector debt-to-revenue and grants ratio (in percent)	125.9	93.6	74.6			137.3	108.1	97.7	92.7	83.7	78.4		73.7	96.9	
PV of public sector debt-to-revenue ratio (in percent)	125.9	93.7	74.7			137.4	108.5	98.0	92.9	83.9	78.6		73.9	96.9	
o/w external 3/	120.5	89.5	62.4			111.6	85.3	78.9	77.5	73.9	73.9		74.2	67.8	
Debt service-to-revenue and grants ratio (in percent) 4/	14.8	22.3	7.3			35.0	29.7	26.6	27.3	24.9	24.2		20.0	13.8	
Debt service-to-revenue ratio (in percent) 4/	3.6	3.1	4.4			17.7	17.6	15.4	15.6	14.0	13.4		9.6	6.7	
Primary deficit that stabilizes the debt-to-GDP ratio	-1.4	-11.5	-18.6			-5.5	1.3	-5.5	-7.4	-6.4	-7.2		-2.2	3.0	
Key macroeconomic and fiscal assumptions															
hide Nominal GDP (local currency)	3629.7	4545.9	6256.5			4767.5	6006.7	6888.3	7672.8	8708.4	9822.3		16928.9	52942.1	
Real GDP growth (in percent)	18.6	20.3	14.8	11.3	7.5	-3.6	12.8	7.1	5.7	6.6	6.2	5.8	5.7	6.7	5.5
hide Average nominal interest rate on public debt (in percent)	6.6	9.2	16.2	9.8		21.2	24.0	20.9	19.9	17.7	17.0	20.1	11.0	6.4	9.9
Average nominal interest rate on forex debt (in percent)	5.6	8.5	15.2	6.6	3.4	21.8	24.7	20.9	19.5	16.7	15.1	19.8	9.0	5.9	8.1
hide Average nominal interest rate on domestic debt (in percent)	27.4	25.0	33.9	31.2	6.1	20.3	22.0	19.3	21.5	25.6	37.5	24.4	2083.6	10.2	134.6
hide Average real interest rate (in percent)	2.7	6.6	12.6	4.2	3.3	24.3	20.9	17.5	16.9	14.8	13.9	18.1	8.5	3.8	7.4
hide Average real interest rate on foreign-currency debt (in percent)	1.7	2.2	2.7	2.5	0.6	3.5	3.3	2.9	2.9	3.0	3.0	3.1	2.9	2.9	2.9
Average real interest rate on domestic debt (in percent)	2.4	14.6	9.2	8.5	5.0	49.4	5.4	11.4	18.5	20.9	34.4	23.3	2011.7	3.6	118.6
hide Exchange rate (LC per US dollar)	80.2	75.0	75.1	58.9	29.7	72.1	70.0	72.1	73.9	74.8	77.6	73.4	87.8	109.6	93.9
hide Nominal depreciation of local currency (percentage change in LC per dollar)	-0.8	-6.4	0.1	110.7	217.6	-4.0	-3.0	3.0	2.5	1.2	3.8	0.6	2.5	-0.1	2.5
hide Exchange rate (US dollar per LC)	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
hide Nominal appreciation (increase in US dollar value of local currency, in percent)	0.8	6.9	-0.1	-26.7	33.5	4.2	3.1	-2.9	-2.4	-1.2	-3.6	-0.5	-2.4	0.1	-2.4
Real exchange rate depreciation (in percent, + indicates depreciation)	-17.6	-11.9	-16.4	13.3	47.8	20.9	...	...	...	...	...	...	...	...	...
Inflation rate (GDP deflator, in percent)	24.4	9.1	22.6	17.2	16.0	-19.5	15.7	7.1	2.5	3.8	2.4	2.0	3.4	6.3	3.7
hide US Inflation rate (GDP deflator, in percent)	3.2	2.7	2.3	2.4	0.6	1.4	1.6	2.0	2.0	2.0	2.0	1.8	2.0	2.0	2.0
Growth of real primary spending (deflated by GDP deflator, in percent)	0.1	0.4	0.1	0.1	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grant element of new external borrowing (in percent)	...	...	...	...	...	9.6	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.6	...

Sources: Country authorities; and Fund staff estimates and projections.
1/ [Indicate coverage of public sector, e.g., general government or nonfinancial public sector. Also whether net or gross debt is used.]
2/ Gross financing need is defined as the primary deficit plus debt service plus the stock of short-term debt at the end of the last period.
3/ Revenues excluding grants.
4/ Debt service is defined as the sum of interest and amortization of medium and long-term debt.
5/ Historical averages and standard deviations are generally derived over the past 10 years, subject to data availability.

Table 4a.Angola: Sensitivity Analysis for Key Indicators of Public Debt 2009-2029

		Projections						
	2009	2010	2011	2012	2013	2014	2019	2029
PV of Debt-to-GDP Ratio								
Baseline	47	39	36	34	32	30	23	16
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	47	38	36	35	35	36	26	-7
A2. Primary balance is unchanged from 2009	47	46	53	61	70	81	116	121
A3. Permanently lower GDP growth 1/	47	39	37	36	34	33	42	44
A4. Low fiscal adjustments	47	55	58	64	65	69	71	56
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2010-2011	47	46	48	50	50	52	57	56
B2. Primary balance is at historical average minus one standard deviations in 2010-2011	47	48	57	54	51	48	38	25
B3. Combination of B1-B2 using one half standard deviation shocks	47	45	49	48	46	45	41	34
B4. One-time 30 percent real depreciation in 2010	47	55	52	50	47	45	40	33
B5. 10 percent of GDP increase in other debt-creating flows in 2010	47	49	45	43	40	38	29	19
PV of Debt-to-Revenue Ratio 2/								
Baseline	137	108	98	93	88	86	82	89
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	137	104	95	94	95	102	93	-38
A2. Primary balance is unchanged from 2009	137	125	141	167	193	231	411	688
A3. Permanently lower GDP growth 1/	137	104	96	96	95	96	201	668
A4. Low fiscal adjustments	137	170	177	202	214	237	270	286
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2010-2011	137	126	129	135	138	148	200	319
B2. Primary balance is at historical average minus one standard deviations in 2010-2011	137	132	153	148	139	137	134	140
B3. Combination of B1-B2 using one half standard deviation shocks	137	123	131	130	126	129	146	195
B4. One-time 30 percent real depreciation in 2010	137	152	139	135	128	129	140	187
B5. 10 percent of GDP increase in other debt-creating flows in 2010	137	134	121	116	109	108	103	110
Debt Service-to-Revenue Ratio 2/								
Baseline	35	30	27	27	25	24	20	14
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	35	30	26	24	24	23	17	-2
A2. Primary balance is unchanged from 2009	35	30	28	34	37	40	53	80
A3. Permanently lower GDP growth 1/	35	22	20	21	20	21	27	57
A4. Low fiscal adjustments	35	27	25	27	26	28	26	25
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2010-2011	35	32	30	34	33	33	33	40
B2. Primary balance is at historical average minus one standard deviations in 2010-2011	35	30	28	36	37	29	23	22
B3. Combination of B1-B2 using one half standard deviation shocks	35	31	28	33	33	29	26	27
B4. One-time 30 percent real depreciation in 2010	35	35	37	40	38	38	34	34
B5. 10 percent of GDP increase in other debt-creating flows in 2010	35	30	28	35	26	27	21	17

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 length of the projection period.

2/ Revenues are defined inclusive of grants.