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THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA

Joint IMF/World Bank Debt Sustainability Analysis 2008

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the International Development Association

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This note assesses the sustainability of Ethiopia's external public debt and total public debt based on the joint World Bank-IMF debt sustainability framework for low-income countries.[1] *While external debt ratios have improved considerably with debt relief and public domestic debt in terms of GDP continues to decline, Ethiopia remains at moderate risk of debt distress.*

I. BACKGROUND

1. **The last DSA undertaken in May 2007 concluded that Ethiopia was at moderate risk of debt distress**.[2] Ethiopia reached its HIPC Initiative completion point in 2004 and benefited from debt relief under the MDRI in 2006. The debt relief provided under both initiatives helped to lower the debt ratio to less than 10 percent of GDP at end 2006/07.[3] [4]While the debt burden indicators were projected to remain below the policy dependent-thresholds for the whole projection period in the last DSA, it was projected that the indicative threshold for the NPV of debt-to-exports ratio would be breached under one stress test, leading to the assessment of moderate risk.

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[1] "Operational Framework for Debt Sustainability Assessments in Low-Income Countries – Further Considerations," IDA/R2005-0056 and http://www.imf.org/External/np/pp/eng/2005/032805.htm, 3/28/05.

[2] IMF Country Paper No.07/247, (July 2007).

[3] The Ethiopian fiscal year runs from July 8 to July 7.

[4] While Ethiopia has received debt relief from most of its creditors, it has not been able to reach agreement with Algeria, Libya, and FR Yugoslavia which account for over 17 percent of the debt stock in 2007/08.

2. **Despite continued strong export growth and an improved current account position, the revised DSA concludes that Ethiopia risk of debt distress remains moderate because of the large financing needs of the public enterprises over the next ten years.** Although the debt burden indicators remain below the policy dependent-thresholds for the whole projection period as in the last DSA, three stress tests breach the threshold for the NPV of debt to exports ratio when the debt stock is measured inclusive of public enterprises (public sector).[5]

II. MACROECONOMIC FRAMEWORK

3. **Except for growth prospects, the macroeconomic framework is slightly more favorable than the one presented in the last DSA.** Export growth in volume and value terms is stronger by 1 percentage point, but the trade balance is projected to deteriorate significantly on account of the rising oil import bill. Net FDI is comparable with the projection made a year ago while loan financing is projected to be higher by ½ percentage point of GDP per annum relative to the projection made a year ago.

[5] The World Bank Country Policy and Institutional Assessment (CPIA) classifies Ethiopia as a medium performer. The thresholds for the debt burden for medium performers are 150, 40 and 250 for the NPV of debt to exports, GDP and revenue respectively. Under the same classification, thresholds for debt service are 20 and 30 percent of exports and revenue, respectively.

Box 1. Macroeconomic Assumptions for the Baseline Scenario

Real GDP grows annually at about 7 percent until 2010/11, rising to 7½ percent thereafter. This assessment assumes continued good harvests supporting agriculture and increased activity in services and industry. **The inflation rate** is projected to decline to single digits within three years in response to tighter monetary and fiscal policies combined with the assumption that convergence of Ethiopia's commodity price index to the world price index is almost complete.

The fiscal deficit (including grants) is projected to decline to 2.5 percent of GDP in 2008/09 from 4.4 percent in 2007/08 in order to address the current macroeconomic imbalances and gradually increase toward 3.5 percent by 2014/15.

The current account deficit (before official transfers) is projected to remain fairly flat at about 10½ percent of GDP through 2012/13 with exports growing slightly faster than imports before improving to average out at 7 percent of GDP over the long term.

Exports of goods are projected to grow in volume at an annual rate of about 10½ percent between 2008/09 and 2012/13, led by pulses, leather products and flowers, with export prices projected to rise at an annual rate of ¾ percent. Over the long run export volume growth is projected to level out at 11½ percent per annum with export prices rising by 1 percent per annum.

Private transfers are assumed to dip slightly over the next few years and level out at 8 ¼ percent of GDP.

Foreign direct investment is envisaged to rise gradually over time from the current level of 2 ½ percent of GDP to slightly above 3 percent of GDP.

Official transfers are projected to average 5½ percent of GDP annually over the next five years, falling to 4½ percent in the long run. **Loan financing** on concessional terms is projected to average about 2 ¾ percent of GDP annually over the next five years but then decline sharply to about 1½ percent of GDP by 2026/27 because of the diminished need for external financing over the longer term. Loan financing for public enterprises at non-concessional rates is projected to average over 2 percent of GDP per annum over the same time period.

III. EXTERNAL DEBT SUSTAINABILITY ANALYSIS

A. Baseline

4. **In the baseline scenario, public and publicly guaranteed external debt remains under the various thresholds.** In particular, the NPV of debt to exports is projected to peak at 119 percent in 2013/14 as investments in the electricity and telecommunication sector reach their peak. This is an improvement over last year's profile for two reasons. First, the

lending profile for the public enterprises has shifted to the future in light of the difficulties of accessing large amounts of concessional financing quickly; this change lowers the NPV of debt. Second, export growth is now projected to be stronger, in light of improvements in export prices. The debt-to-GDP ratio has a similar hump-shaped profile, rising initially but falling over time to about 10 percent of GDP. Although the debt service ratio remains below the threshold of 20 percent of exports, it is projected to more than double over the next few years as a large fraction of new borrowing is for public enterprises on non-concessional terms.

5. **Under the historical scenario, the debt burden indicators are projected to reach higher levels than under the baseline scenario, but they do not breach the thresholds.** The NPV of debt to exports peaks at 124 percent in 2013/14 before dipping and settling at about 50 percentage points higher than in the baseline at the end of the forecast period. The profile of the NPV of debt to GDP ratio also deteriorates considerably over time to level out at 17 percent of GDP in 2026/27. The reason for the continued deterioration in the debt to GDP ratio using historical parameters is that the historical growth rate is slightly below the projection (about ½ percent per annum) and the historical borrowing needs are considerably higher than the projected needs over the 2016/17-2026/27 period.

B. Sensitivity Tests

6. **Three of the stress tests breach the indicative threshold for the NPV of debt to exports over the forecast horizon.** If new public sector loans are negotiated on less favorable terms (200 basis point higher interest rate during the forecast horizon), the debt ratio peaks at 166 percent in 2012/13, 16 percentage points above the debt sustainability threshold (Table 2, Figure 1).Also, if export growth is lower than the historical average by 1 standard deviation, the debt ratio breaches the threshold very soon and peaks at almost 216 percent in 2012/13. The scenario that applies one half standard deviation shocks to growth, exports and grants has similar features.

7. **The debt profile is highly sensitive to assumptions made about export growth in the long run although less sensitive to output growth prospects.** The baseline long-run forecast assumes that export growth of goods levels out at about 11 ½ percent per annum, with slightly higher growth for service exports on account of the expected foreign exchange proceeds from large infrastructure investments in the electricity, telecommunication, and transportation sectors. In a scenario with lower export growth (8 percent per annum over the forecast horizon) and lower output growth (5 percent per annum over the next five years compared to an average of 7 percent per annum in the baseline) the profile of the NPV of debt to exports would almost breach the indicative threshold in 2013/14. The debt profile in relation to output would not change much since the reduction in growth only lasts for five years and lower imports are reflected in higher reserve coverage rather than lower external borrowing (Figure 2). In an alternative scenario with export growth at 15 percent per annum,

closer to the growth rate projected by the authorities, the debt trajectory in terms of exports would be much more sustainable.

8. **Increased financing to ease the balance of payments constraint would only have a significant effect on debt sustainability if it were on nonconcessional terms.** As indicated in the 2008 IMF Article IV staff report, the petroleum bill for 2008/09 is about US$1 billion higher than in 2006/07 on account of the sharp rise in oil prices and the fast-growing economy. If additional financing of about US$1 billion were obtained on market terms to ease the balance of payments constraint, partly resulting from higher oil prices, it would raise the ratio of the NPV of debt to exports to considerably to 142 percent at its peak , compared with 119 percent under the baseline scenario. By contrast, if the financing were obtained on IDA terms, the ratio of the NPV of debt to exports is expected to reach 127 percent at its peak.

IV. FISCAL SUSTAINABILITY ANALYSIS

9. **Public domestic debt in terms of GDP continues to decline.** Despite significant borrowing by some public enterprises in 2007/08, domestic financing of the general government has been broadly in line with a relatively tight budget. Moreover, negative real interest rates on public debt resulting from rising inflation have also helped reduce the real debt burden. Consequently, domestic debt is projected to decline to 25 percent of GDP by end 2007/08, down by about 3 percentage points from a year ago.

10. **With the prospective increase in external debt, Ethiopia's public debt burden (including domestic debt) is expected to display a hump-shaped profile over the projected period**. The domestic debt profile is based on two assumptions: (i) domestic financing will gradually increase to 2½ percent of GDP per annum, and (ii) real domestic interest rates will gradually become positive. While rising in the short-run, the NPV of debt to GDP ratio is projected to decline from about 33 percent in 2013/14 to 28 percent over the long term (Figure 3). The NPV of debt to revenue ratio is projected to reach 185 percent by 2014/15 but to fall below 170 percent over the long term. Domestic financing of 3 percent of GDP, comparable to the outturn of 2006/07 would result in less favorable debt dynamics. The NPV of debt to GDP ratio would be close to 40 percent in 2013/14, before trending down. Moreover, if real interest rates became positive from 2008/09, without further fiscal tightening, the fiscal deficit would increase by 1–2 percentage points for the next few years and raise the NPV of debt to GDP ratio to 38 percent and the NPV of debt to revenue ratio to over 250 percent by 2013/14, before trending down to 220 percent in the long-term.

11. **Debt indicators would worsen under the lower growth scenario described above.** With real GDP growth assumed at 5 percent per annum for the next five years, the NPV of

debt-to-GDP ratio would climb up to 40 percent by 2013/14 and beyond, and the NPV of debt-to-revenue ratio would follow the similar path reaching 250 percent in 2026/27. This scenario highlights the importance of maintaining the growth momentum while continuing with adjustment efforts to correct the macroeconomic imbalances and avoid the debt stock following an unsustainable path. Delaying fiscal consolidation would significantly increase debt risks, as illustrated in the historical and bound tests.

V. CONCLUSION

12. **While external debt ratios have improved considerably with debt relief, and some of the debt indicators in the DSA have improved relative to last year on account of more rapid export growth, Ethiopia remains at moderate risk of debt distress.** This assessment illustrates the importance for Ethiopia to address its current macroeconomic imbalances so that it can maintain strong export and output growth. On the issue of debt, Ethiopia should secure grant and concessional financing, strengthen its debt management capacity, and develop a comprehensive debt strategy that includes public enterprises and contingent liabilities.

Table 1. Ethiopia: External Debt Sustainability Framework, Baseline Scenario, 2006/07-2026/27 1/
(In percent of GDP, unless otherwise indicated)

		Projections								
	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2016/17	2021/22	2026/27
External debt (nominal) 1/	**9.6**	**9.5**	**13.3**	**17.2**	**20.6**	**23.2**	**25.3**	**24.1**	**19.0**	**16.0**
o/w public and publicly guaranteed (PPG)	9.6	9.5	13.3	17.2	20.6	23.2	25.3	24.1	19.0	16.0
Change in external debt	-27.4	-0.1	3.8	3.9	3.4	2.7	2.0	-1.2	-0.8	-0.5
Identified net debt-creating flows	-1.2	1.6	3.5	2.7	2.4	1.3	0.2	-1.7	-1.4	-1.2
Non-interest current account deficit	**4.3**	**4.7**	**6.0**	**5.7**	**6.1**	**5.1**	**4.3**	**2.6**	**2.8**	**2.9**
Deficit in balance of goods and services	19.4	18.2	19.2	19.1	19.5	19.0	18.4	16.2	15.7	15.2
Exports	12.8	12.4	12.1	12.6	13.3	14.8	15.9	19.5	21.3	23.2
Imports	32.2	30.6	31.3	31.7	32.8	33.8	34.2	35.7	37.0	38.5
Net current transfers (negative = inflow)	-14.8	-13.5	-13.1	-13.3	-13.3	-13.7	-13.9	-13.3	-12.5	-11.8
Other current account flows (negative = net inflow)	-0.3	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2	-0.4	-0.4	-0.5
Net FDI (negative = inflow)	**-2.5**	**-2.6**	**-2.2**	**-2.6**	**-3.0**	**-3.0**	**-3.1**	**-3.1**	**-3.1**	**-3.1**
Endogenous debt dynamics 2/	**-3.1**	**-0.5**	**-0.3**	**-0.5**	**-0.7**	**-0.9**	**-1.0**	**-1.1**	**-1.1**	**-1.0**
Contribution from nominal interest rate	0.2	0.1	0.2	0.3	0.5	0.6	0.7	0.6	0.2	0.1
Contribution from real GDP growth	-3.3	-0.6	-0.5	-0.8	-1.1	-1.4	-1.6	-1.7	-1.4	-1.1
Contribution from price and exchange rate changes	0.2	…	…	…	…	…	…	…	…	…
Residual (3-4) 3/	**-26.1**	**-1.7**	**0.2**	**1.2**	**1.0**	**1.4**	**1.8**	**0.5**	**0.6**	**0.6**
o/w exceptional financing	-23.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NPV of external debt 4/	6.2	6.3	9.5	12.6	15.3	17.4	18.9	16.7	11.9	9.9
In percent of exports	48.6	50.9	78.8	100.2	114.8	117.5	119.1	85.7	55.7	42.7
NPV of PPG external debt	**6.2**	**6.3**	**9.5**	**12.6**	**15.3**	**17.4**	**18.9**	**16.7**	**11.9**	**9.9**
In percent of exports	48.6	50.9	78.8	100.2	114.8	117.5	119.1	85.7	55.7	42.7
Debt service-to-exports ratio (in percent)	3.7	2.9	3.1	5.8	8.0	9.6	10.6	9.7	4.8	2.7
PPG debt service-to-exports ratio (in percent)	**3.7**	**2.9**	**3.1**	**5.8**	**8.0**	**9.6**	**10.6**	**9.7**	**4.8**	**2.7**
Total gross financing need (billions of U.S. dollars)	0.5	0.6	1.2	1.2	1.4	1.3	1.1	0.7	0.6	0.6
Non-interest current account deficit that stabilizes debt ratio	31.7	4.7	2.3	1.8	2.7	2.5	2.3	3.8	3.6	3.5
Key macroeconomic assumptions										
Real GDP growth (in percent)	11.4	8.4	6.0	6.5	7.0	7.5	7.5	7.5	7.5	7.5
GDP deflator in US dollar terms (change in percent)	15.0	16.7	12.0	2.0	-0.7	-0.8	0.0	1.7	1.7	1.8
Effective interest rate (percent) 5/	0.6	1.6	2.1	2.7	3.0	3.1	3.1	2.6	1.3	1.0
Growth of exports of G&S (US dollar terms, in percent)	18.2	22.9	15.4	13.1	12.6	18.2	15.4	13.5	11.3	11.3
Growth of imports of G&S (US dollar terms, in percent)	12.9	20.2	21.2	9.9	10.2	9.6	9.0	10.1	10.2	10.3
Grant element of new public sector borrowing (in percent)	44.4	29.9	20.8	22.2	21.8	21.4	22.3	43.7	47.1	46.9
Memorandym item:										
Nominal GDP (billions of US dollars)	19.4	24.6	29.2	31.7	33.7	35.9	38.7	54.6	85.5	133.9

Source: Staff simulations.

1/ Includes both public and private sector external debt.

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

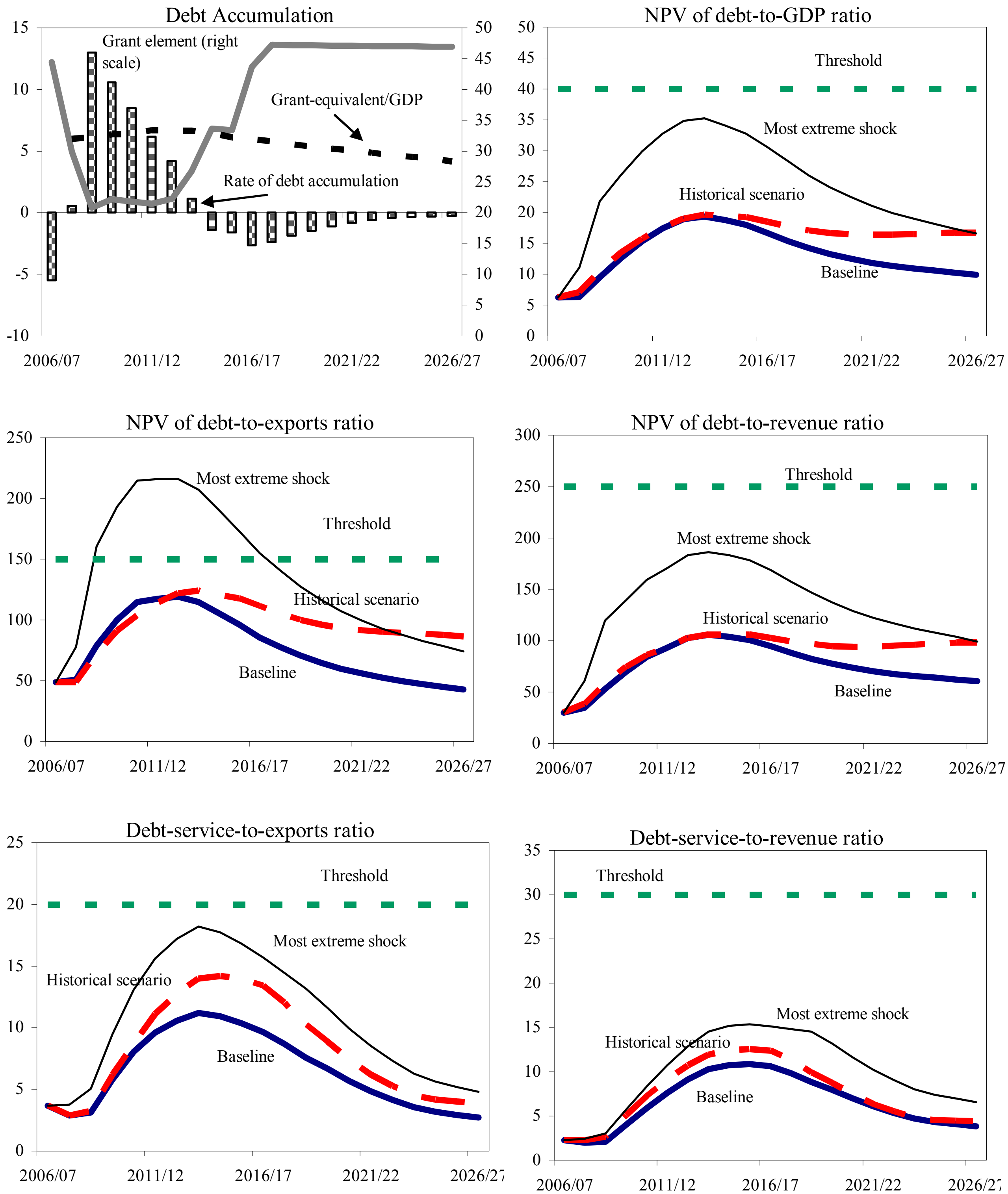
3/ Includes exceptional financing (i.e., changes in arrears and debt relief); changes in gross foreign assets; and valuation adjustments. For projections also includes contribution from price and exchange rate changes.

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

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

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

Figure 1. Ethiopia: Indicators of Public and Publicly Guaranteed External Debt
Under Alternative Scenarios, 2006/07-2026/27



Source: Staff projections and simulations.

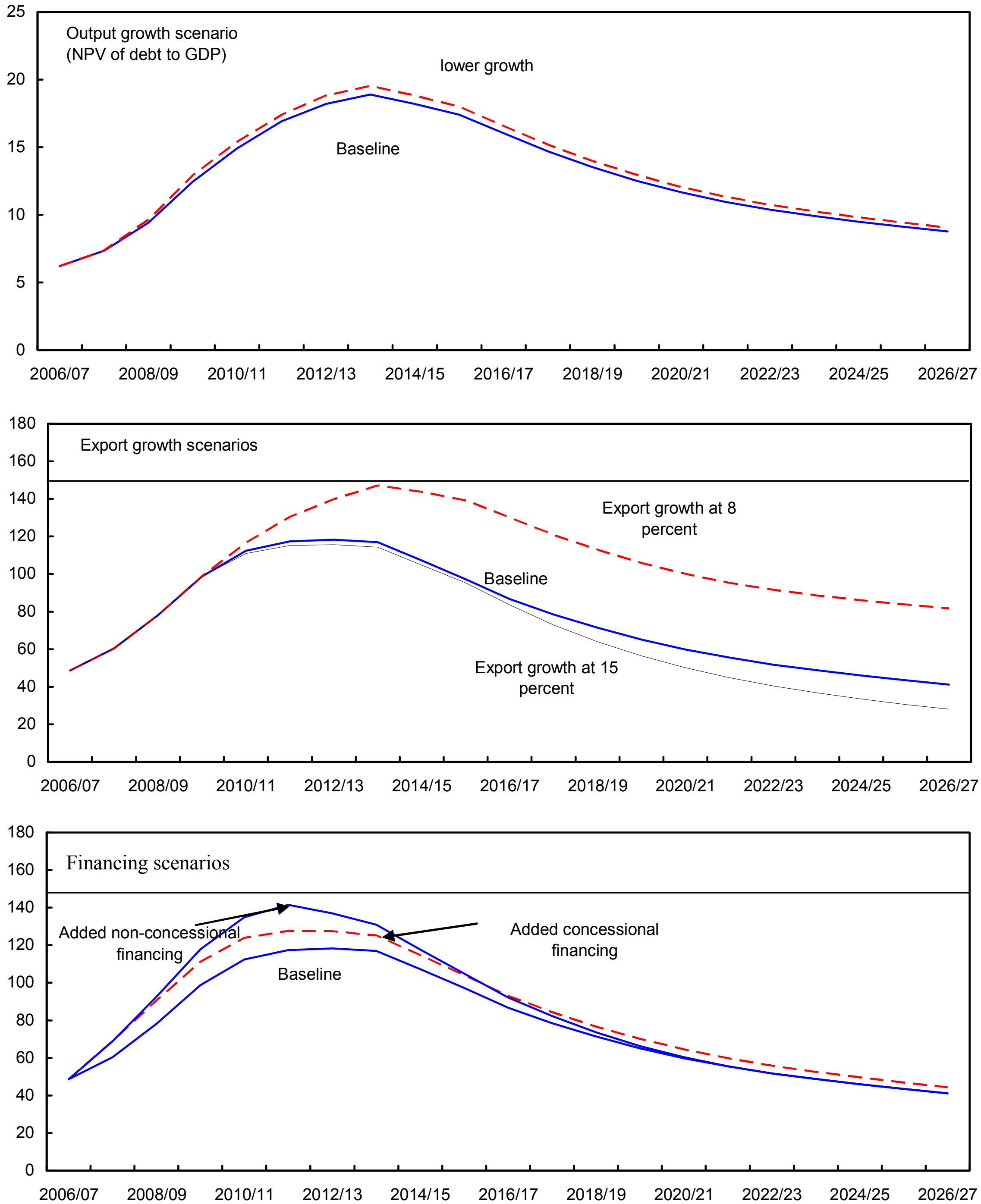
Table 2. Ethiopia: Sensitivity Analyses for Key Indicators of Public and Publicly Guaranteed External Debt, 2006/07-2026/27
(percent of GDP unless otherwise stated)

		Projections							
	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2016/17	2021/22	2026/27
NPV of debt-to-GDP ratio									
Baseline	6.2	6.3	9.5	12.6	15.3	17.4	16.7	11.9	9.9
A. Alternative Scenarios									
A1. Key variables at their historical averages in 2007-26 1/	6.2	7.1	10.6	13.5	15.7	17.5	18.5	16.4	16.7
A2. New public sector loans on less favorable terms in 2007-26 2/	6.2	7.0	11.6	16.2	20.4	23.7	26.2	21.2	18.3
B. Bound Tests									
B1. Real GDP growth at historical average minus one standard deviation in 2007-08	6.2	6.8	10.9	14.5	17.5	19.9	19.1	13.6	11.4
B2. Export value growth at historical average minus one standard deviation in 2007-08 3/	6.2	7.3	11.9	14.9	17.6	19.6	18.6	13.0	10.6
B3. US dollar GDP deflator at historical average minus one standard deviation in 2007-08	6.2	7.8	14.0	18.6	22.6	25.6	24.6	17.5	14.6
B4. Net non-debt creating flows at historical average minus one standard deviation in 2007-08 4/	6.2	8.6	13.6	16.6	19.2	21.2	19.9	13.8	11.0
B5. Combination of B1-B4 using one-half standard deviation shocks	6.2	11.1	21.8	26.1	29.9	32.8	30.6	21.1	16.6
B6. One-time 30 percent nominal depreciation relative to the baseline in 2007 5/	6.2	8.5	12.8	17.0	20.6	23.4	22.4	16.0	13.4
NPV of debt-to-exports ratio									
Baseline	48.6	50.9	78.8	100.2	114.8	117.5	85.7	55.7	42.7
A. Alternative Scenarios									
A1. Key variables at their historical averages in 2007-26 1/	48.6	48.9	72.0	91.0	104.0	113.9	111.3	91.6	86.5
A2. New public sector loans on less favorable terms in 2007-26 2/	48.6	56.0	96.3	129.0	152.7	160.3	134.8	99.5	78.8
B. Bound Tests									
B1. Real GDP growth at historical average minus one standard deviation in 2007-08	48.6	50.9	78.8	100.2	114.8	117.5	85.7	55.7	42.7
B2. Export value growth at historical average minus one standard deviation in 2007-08 3/	48.6	77.4	160.5	193.0	214.7	216.0	155.2	99.5	74.0
B3. US dollar GDP deflator at historical average minus one standard deviation in 2007-08	48.6	50.9	78.8	100.2	114.8	117.5	85.7	55.7	42.7
B4. Net non-debt creating flows at historical average minus one standard deviation in 2007-08 4/	48.6	69.3	112.5	131.5	143.9	143.5	102.2	64.9	47.4
B5. Combination of B1-B4 using one-half standard deviation shocks	48.6	86.1	168.6	193.4	209.3	207.2	146.7	92.6	66.8
B6. One-time 30 percent nominal depreciation relative to the baseline in 2007 5/	48.6	50.9	78.8	100.2	114.8	117.5	85.7	55.7	42.7
Debt service ratio									
Baseline	3.7	2.9	3.1	5.8	8.0	9.6	9.7	4.8	2.7
A. Alternative Scenarios									
A1. Key variables at their historical averages in 2007-26 1/	3.7	2.9	3.2	6.2	8.7	11.1	13.4	6.2	3.9
A2. New public sector loans on less favorable terms in 2007-26 2/	3.7	2.9	2.9	4.8	6.5	7.4	11.1	8.2	6.1
B. Bound Tests									
B1. Real GDP growth at historical average minus one standard deviation in 2007-08	3.7	2.9	3.1	5.8	8.0	9.6	9.7	4.8	2.7
B2. Export value growth at historical average minus one standard deviation in 2007-08 3/	3.7	3.8	5.1	9.5	13.1	15.6	15.7	8.5	4.8
B3. US dollar GDP deflator at historical average minus one standard deviation in 2007-08	3.7	2.9	3.1	5.8	8.0	9.6	9.7	4.8	2.7
B4. Net non-debt creating flows at historical average minus one standard deviation in 2007-08 4/	3.7	2.9	3.1	5.8	8.1	9.6	9.7	5.5	3.1
B5. Combination of B1-B4 using one-half standard deviation shocks	3.7	3.5	4.2	7.9	11.0	13.1	13.1	7.8	4.4
B6. One-time 30 percent nominal depreciation relative to the baseline in 2007 5/	3.7	2.9	3.1	5.8	8.0	9.6	9.7	4.8	2.7
Memorandum item:									
Grant element assumed on residual financing (i.e., financing required above baseline) 6/	67	66.8	66.8	66.8	66.8	66.8	66.8	66.8	66.8

Source: Staff projections and simulations.

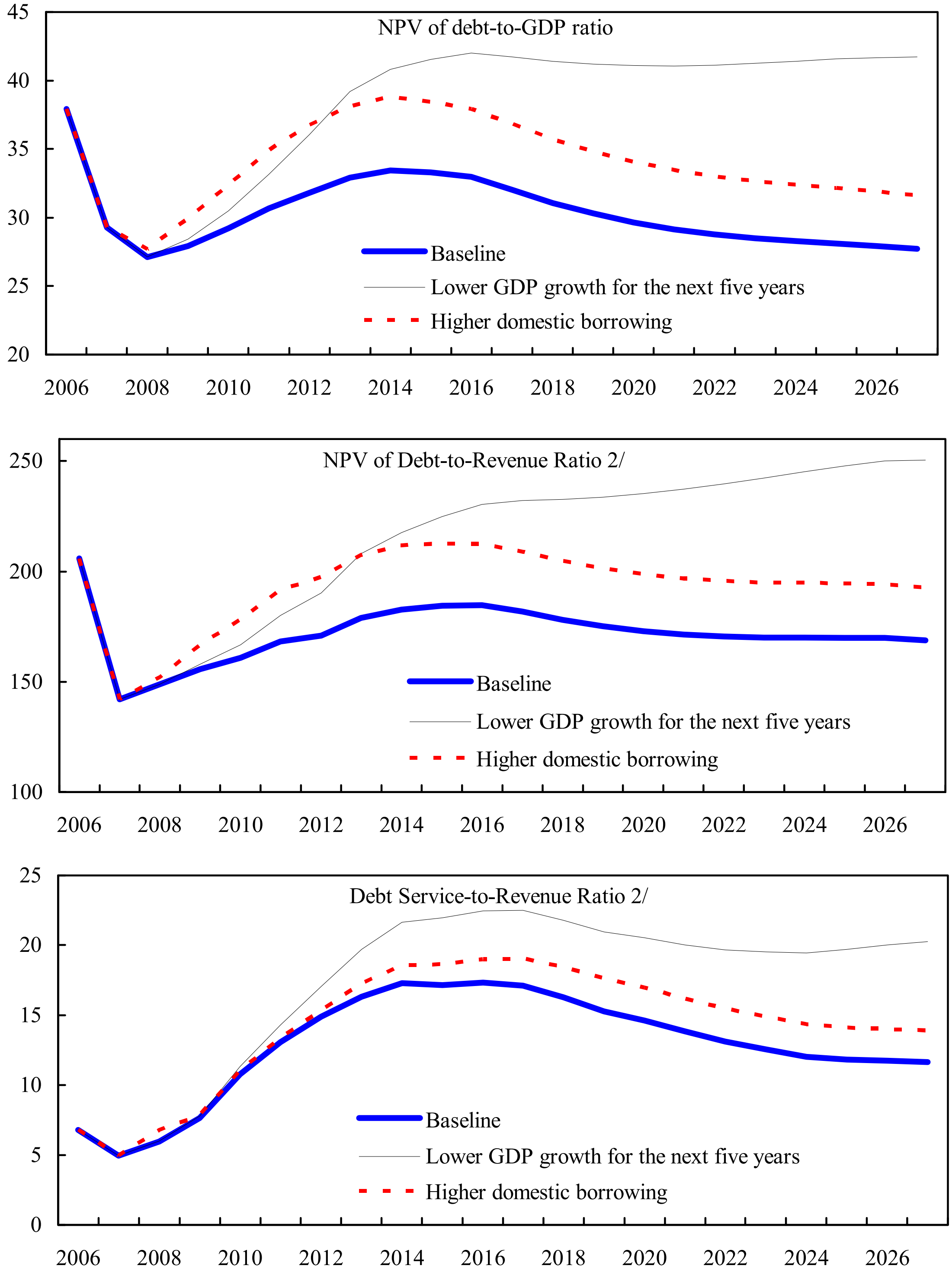
1/ Variables include real GDP growth, growth of GDP deflator (in U.S. dollar terms), non-interest current account in percent of GDP, and non-debt creating flows.
2/ Assumes that the interest rate on new borrowing is by 2 percentage points higher than in the baseline., while grace and maturity periods 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 2. Ethiopia: Debt Sustainability Scenarios
(NPV of debt to exports, unless otherwise stated)



Source:IMF staff estimates

Figure 3.Country: Indicators of Public Debt Under Alternative Scenarios, 2006-2027 1/



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

Table 3.Country: Public Sector Debt Sustainability Framework, Baseline Scenario, 2006/7-2026/27
(In percent of GDP, unless otherwise indicated)

	Act.	Projections								
	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2016/17	2021/22	2026/27
Public sector debt 1/	37.9	34.4	35.0	36.8	38.7	40.1	41.5	40.7	36.5	34.1
o/w foreign-currency denominated	9.6	9.5	13.3	17.2	20.6	23.2	25.3	24.1	19.0	16.0
Change in public sector debt	-29.8	-3.6	0.7	1.7	1.9	1.5	1.3	-1.0	-0.6	-0.5
Identified debt-creating flows	-10.9	-4.3	-3.6	-2.4	-1.5	-1.6	-1.6	-1.1	-0.7	-0.5
Primary deficit	3.6	4.6	2.2	0.9	0.8	0.7	0.9	1.7	1.9	1.9
Revenue and grants	20.6	18.2	17.9	18.2	18.2	18.6	18.4	17.6	16.9	16.4
of which : grants	6.8	4.2	4.2	4.3	4.5	4.9	4.8	4.3	3.7	3.3
Primary (noninterest) expenditure	24.2	22.8	20.2	19.1	19.0	19.3	19.3	19.3	18.8	18.3
Automatic debt dynamics	-13.9	-8.3	-5.8	-3.2	-2.3	-2.3	-2.6	-2.8	-2.7	-2.5
Contribution from interest rate/growth differential	-10.4	-7.2	-5.1	-3.3	-2.9	-3.0	-3.0	-2.9	-2.6	-2.3
of which : contribution from average real interest rate	-3.4	-4.3	-3.2	-1.2	-0.5	-0.3	-0.2	0.0	0.0	0.1
of which : contribution from real GDP growth	-7.0	-2.9	-2.0	-2.2	-2.4	-2.7	-2.8	-2.9	-2.6	-2.4
Contribution from real exchange rate depreciation	-3.5	-1.1	-0.7	0.1	0.6	0.7	0.4	0.2	-0.1	-0.1
Other identified debt-creating flows	-0.6	-0.5	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Debt relief (HIPC and other)	-0.6	-0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Residual, including asset changes	-18.9	0.7	4.3	4.1	3.4	3.1	3.0	0.1	0.1	0.1
NPV of public sector debt	29.3	27.1	27.9	29.2	30.7	31.8	32.9	32.0	28.8	27.7
o/w external	0.9	2.3	6.2	9.6	12.6	14.9	16.7	15.4	11.2	9.6
Gross financing need 2/	4.6	5.7	3.6	2.9	3.2	3.5	3.9	4.7	4.1	3.8
NPV of public sector debt-to-revenue ratio (in percent) 3/	142.0	148.8	155.8	160.7	168.3	170.8	178.9	181.8	170.4	168.7
o/w external	4.4	12.4	34.5	52.9	69.0	80.2	90.8	87.6	66.3	58.5
Debt service-to-revenue ratio (in percent) 3/ 4/	5.0	6.0	7.6	10.8	13.1	14.9	16.3	17.1	13.1	11.6
Primary deficit that stabilizes the debt-to-GDP ratio	33.4	8.1	1.6	-0.8	-1.1	-0.8	-0.4	2.7	2.5	2.4
Key macroeconomic and fiscal assumptions										
Real GDP growth (in percent)	11.4	8.4	6.0	6.5	7.0	7.5	7.5	7.5	7.5	7.5
Average nominal interest rate on forex debt (in percent)	0.6	1.7	2.3	3.0	3.3	3.4	3.4	2.7	1.4	1.0
Average real interest rate on domestic currency debt (in percent)	-12.4	-16.4	-13.6	-5.8	-2.8	-2.2	-1.6	-0.4	0.1	0.4
Inflation rate (GDP deflator, in percent)	16.8	23.4	21.2	12.3	9.3	9.3	9.1	7.7	7.7	7.7
Growth of real primary spending (deflated by GDP deflator, in percent)	25.0	2.3	-6.0	0.7	6.4	9.1	7.6	6.7	6.7	7.2
Grant element of new external borrowing (in percent)	44.4	29.9	20.8	22.2	21.8	21.4	22.3	43.7	47.1	46.9

Sources: Ethiopian authorities; and Fund staff estimates and projections.
1/ Covering public and publicly guaranteed debt on gross basis.
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.

Table 4. Ethiopia: Sensiticity Analysis for Key Indicators of Public Debt; 2006/07-2026/27

	Act.	Projections								
	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2016/17	2021/22	2026/27
NPV of Debt-to-GDP Ratio										
Baseline	29	27	28	29	31	32	33	32	29	28
A. Alternative scenarios										
A1. Real GDP growth and primary balance are at historical averages	29	27	29	32	36	40	43	49	50	53
A2. The government's net fomestic borrowing is at 3 percent of GDP. 1/	29	28	30	32	35	37	38	37	33	32
A3. Lower GDP growth for the next five years 2/	29	27	28	30	33	36	39	42	41	42
B. Bound tests										
B1. Real GDP growth is at historical average minus one standard deviations in 2008/09-2009/10	29.3	27	30	35	38	41	44	47	47	48
B2. Primary balance is at historical average minus one standard deviations in 2008/09-2009/10	29.3	27	31	36	37	38	39	37	32	29
B3. Combination of B1-B2 using one half standard deviation shocks	29.3	27	31	36	37	38	38	35	29	26
B4. One-time 30 percent real depreciation in 2008/09	29.3	27	29	30	31	33	34	34	30	28
NPV of Debt-to-Revenue Ratio 3/										
Baseline	142	149	156	161	168	171	179	182	170	169
A. Alternative scenarios										
A1. Real GDP growth and primary balance are at historical averages	142	148	160	177	197	213	234	272	289	308
A2. The government's net fomestic borrowing is at 3 percent of GDP. 1/	142	152	167	178	192	197	207	209	196	193
A3. Lower GDP growth for the next five years 2/	142	149	158	167	180	190	208	232	240	251
B. Bound tests										
B1. Real GDP growth is at historical average minus one standard deviations in 2008/09-2009/10	142	149	167	189	205	215	231	260	273	287
B2. Primary balance is at historical average minus one standard deviations in 2008/09-2009/10	142	149	171	197	203	204	212	209	188	174
B3. Combination of B1-B2 using one half standard deviation shocks	142	149	169	194	200	200	206	199	172	155
B4. One-time 30 percent real depreciation in 2008/09	142	149	160	164	173	177	187	194	181	172
Debt Service-to-Revenue Ratio 3/										
Baseline	5	6	8	11	13	15	16	17	13	12
A. Alternative scenarios										
A1. Real GDP growth and primary balance are at historical averages	5	6	5	12	18	21	24	26	24	27
A2. The government's net fomestic borrowing is at 3 percent of GDP. 1/	5	7	8	11	13	15	17	19	15	14
A3. Lower GDP growth for the next five years 2/	5	6	8	11	14	17	20	22	20	20
B. Bound tests										
B1. Real GDP growth is at historical average minus one standard deviations in 2008/09-2009/10	5	6	8	13	18	21	23	25	23	25
B2. Primary balance is at historical average minus one standard deviations in 2008/09-2009/10	5	6	8	16	23	19	19	18	16	13
B3. Combination of B1-B2 using one half standard deviation shocks	5	6	8	15	21	18	18	17	14	10
B4. One-time 30 percent real depreciation in 2008/09	5	6	8	12	15	17	19	20	14	12

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

1/ Assumes that the government's net domestic borrowing stays at 3 percent of GDP during 2007/08-2026/27.

2/ Assumes the GDP growth at five percent during 2009-2014, with the same amount of public sector borrowing as assumed under Baseline scenario.

3/ Revenues are defined inclusive of grants.