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THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA

Joint IMF/World Bank Debt Sustainability Analysis 2010

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the International Development Association

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Based on the joint World Bank-IMF debt sustainability framework for low-income countries, Ethiopia's debt distress rating has fallen to low risk. The introduction of gross workers' remittances as a source of enhanced repayment capacity and the resilience of the Ethiopian economy to the global economic crisis have contributed to this improvement. Notwithstanding this development, the debt ratio continues to rise and liquidity risks are prevalent, underscoring the need to closely monitor borrowing of the largest public enterprises, develop an integrated debt strategy for the entire public sector, and invigorate structural reforms to attract foreign direct investment (FDI) and stimulate growth of exports.

I. Background and Key Findings

1. **The last Debt Sustainability Analysis (DSA) undertaken in July 2009 concluded that Ethiopia was at moderate risk of debt distress**.[1] Ethiopia reached its Heavily Indebted Poor Country Initiative completion point in 2004 and benefited from debt relief under the Multilateral Debt Relief Initiative in 2006. Subsequently, due to higher borrowing by public enterprises, the external public and publicly guaranteed (PPG) debt ratio rose to 14 percent of GDP at end 2008/09.[2,3] Ethiopia's current level of external PPG debt is largely concessional and is held equally between multilateral and bilateral

[1] IMF Country Report No. 09/96.

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

[3] While Ethiopia has received debt relief from most of its creditors, it has not been able to reach agreement with Algeria, Bulgaria, India, Italy, Czechoslovakia and FR Yugoslavia, which account for over 4.4 percent of the debt stock in 2008/09. Agreements regarding Russian debts (US$161.2 million) are at an advanced stage of negotiation and, thus, excluded from this DSA. However, progress has stalled on arrears (US$240.4 million) with Libya and therefore HIPC terms are assumed.

creditors, with the share of non-Paris Club creditors (mostly from China and India) quite prominent at almost 40 percent of total debt. The share of commercial creditors is very small.[4]

2. **The current DSA differs from earlier DSAs for Ethiopia in that it explicitly takes account of gross workers' remittances and this lowers Ethiopia's debt distress risk from moderate to low**. Although the rapid rise in the financing of the public enterprises is projected to raise the present value (PV) of debt to exports to 133 percent in 2010/11, close to the original threshold, the peak is considerably below the adjusted threshold when the PV of debt is expressed in terms of exports and workers' remittances.[5] The threshold for the PV of debt to exports and workers' remittances is marginally breached under three stress tests (for export growth, non-debt creating flows, and a combination of shocks) but the breach is just for two years at most. As a result the risk classification of Ethiopia switches from moderate to low. The threshold based on the PV of debt-to-exports ratio is also breached under three stress tests, but these breaches are reversed within 10 years which is one of the conditions required for using remittance flows in the debt sustainability assessment.[6]

3. Relative to last year's projections, the peak in the profile of the PV of debt is lower by about 6 percentage points, mainly because of slightly lower borrowing and interest costs. The profile of debt service is lower than last year's projections because large borrowings of the telecom company were found to have a two year grace period for interest (Table 1).

II. Macroeconomic Assumptions

4. **The macroeconomic framework over the medium term is comparable to the one presented in the last DSA (Box 1)**. While the export growth in goods is weaker, growth in service exports is expected to be stronger on account of increased export of electricity and higher investment by the national airline, with the net effect having minimal impact on the external current account. Given that both private and official external flows held up well during the recent global crisis, FDI and official transfers are projected to be up slightly compared to recent years.

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[4] Ethiopian Airlines (EAL) debt is excluded from general government debt, because, although owned by the government, it is run on commercial terms. It has managerial independence, it borrows externally without a government guarantee, publishes annual audited reports, and makes sizeable profits (6 percent net profit margin).

[5] Based on the Country Policy and Institutional Assessment (CPIA) score, Ethiopia is classified as a medium performer. The thresholds for the debt burden for medium performers are 150, 40 and 250 for the PV of debt to exports, GDP and revenue respectively; debt service thresholds are 20 and 30 percent of exports and revenue, respectively. In the scenarios that include workers' remittances, the thresholds have been revised downward by 10 percent so that the corresponding threshold for PV of debt to exports and remittances is 135 percent and is 18 percent for debt service to exports and remittances and the PV of debt to GDP and remittances is 36 percent.

[6] Remittances are recorded through official and unofficial channels (the latter component is estimated using banking system flows).Remittances can be used explicitly in the DSA analysis as they are large and stable source of income for Ethiopia and the breaches under the analysis excluding remittances are not protracted (SM/10/16).

III. External Debt Sustainability Analysis

A. Baseline without Remittances

5. **Under the baseline scenario, public and publicly guaranteed external debt will rise over the next few years, but will remain below the various thresholds**. In particular, the PV of debt to exports is projected to rise by about 32 percentage points to 119 percent in 2009/10 and to rise further next year to peak at 133 percent. Part of this increase is associated with the reduction in the discount rate from 5 percent to 4 percent in this DSA. The PV of debt-to-GDP ratio has a similar hump-shaped profile to the debt-to-export ratio, although peaks slightly later in 2012/13 at about 18¾ percent of GDP. The debt service ratio remains below the threshold of 20 percent of exports, but is projected to rise rapidly over the next few years as a large fraction of public enterprises borrowing in recent years has been on non-concessional terms. Over the next few years, the public external debt ratio is projected to peak at about 23½ percent of GDP in 2014/15 with a change in composition since the large public enterprise investments are mainly sourced from bilateral creditors (China, France, Italy, and India).

6. **Under the historical scenario, the debt burden indicators are lower than under the baseline scenario in the short term but rise above those of the baseline scenario over time**. The PV of debt to exports peaks at the value of 119 percent in 2009/10 before dipping considerably during the forecast period. The profile of the PV of debt to GDP ratio is quite different, falling initially but then growing over time to reach almost 27 percent of GDP by 2029/30. The reason for the different profile in the baseline is that the projected non-interest current account deficit is considerably lower than the historical average.

B. Sensitivity Tests

7. **Three stress tests breach the indicative threshold for the PV of debt to exports over the forecast horizon**. If export growth is slower than the historical average by 1 standard deviation, the debt ratio peaks at 233 percent in 2011/12. Also, if the net non-debt creating flows (FDI and current transfers) are lower than the historical average by one standard deviation, the PV of debt to export ratio peaks at 197 percent in 2011/12. The combination of various ½ standard deviation shocks also breaches the threshold. But because all three breaches are reversed within 10 years, Ethiopia meets the new guideline that allows the use of the remittance flows in the debt sustainability assessment.

Box 1. Ethiopia: Macroeconomic Assumptions for the Baseline Scenario

Real GDP growth is projected to fall to 7 percent in 2009/10, rising to 7¾ percent over the medium term and remain within the 7–8 percent range in the long-run. This assessment assumes continued good harvests supporting agriculture, increased activity in services and industry and strong growth dividend from the large infrastructure projects being built by the public enterprises. In terms of factors of production, the long-term growth rate is based on a contribution of 2 percent output growth from labor, 3 percent output growth from capital, and a total factor productivity increase corresponding to almost 3 percent output growth per annum. The TFP assumption is based on the recent historical experience. **The inflation rate** is projected to remain in single digit in response to cautious monetary policies combined with the assumption of moderate commodity price increases in the global market. Inflation rate in the long-run is assumed to be around 6 percent. **The fiscal deficit (including grants)** is projected to rise from 0.9 percent in 2008/09 to 2.1 percent of GDP in 2009/10 and stabilize at this level to facilitate priority spending. The fiscal anchor is an assumption of domestic financing of 1½ percent of GDP per annum.

The current account deficit (before official transfers) is projected to deteriorate to 13 percent of GDP in 2009/10 before improving to average out at 7 percent of GDP over the long term. The improvement is based on faster export than import growth (see below). **Exports of goods** are projected to rebound to 16 percent growth in 2009/10, in sync with the strong recovery in global trade and recovery from weakness in 2008/09. Over the medium term, exports maintain healthy levels, led by coffee, oil seeds, pulses, flowers, garments and leather products. Export prices are projected to weaken, growing at an annual rate of 1 percent, with volumes rising to 10 percent per annum. **Exports of services** are projected to grow at a faster rate (over 20 percent per annum) as the investments in the airline and electricity sectors begin to pay financial dividends in terms of export receipts The airline is projected to invest US$3–4 billion over the next few years and triple its revenue. In addition, once the Gibe III dam is operational, annual export receipts of US$400 million are projected from neighboring countries. **Imports of goods and services** have slowed down from 32 percent growth in 2007/08 to 12 percent in 2009/10 and projected to level off at an annual average rate of 10 percent once the impact of recent 40 percent plus devaluation takes hold.

In spite of the global slowdown, **workers' remittances** remain flat in dollar terms in 2009/10 and at about 8½ percent of GDP thereafter. Given the strong resilience of FDI during recent global economic crisis, **foreign direct investment** is projected to rise this year by over ½ percent to 3½ percent of GDP and further to 4 percent of GDP by 2012/13 through continued improvements in the investment climate[7].

Official transfers rise to 5¼ percent of GDP in 2009/10 and remain at this level. **Loan financing** on concessional terms is projected at 1¾ percent of GDP in 2009/10 with sizeable increases in 2010/11 and 2011/12, associated with increased concessional financing of hydro power. Subsequently, the concessional loan ratio reverts to historical levels. Loan financing for public enterprises at non-concessional rates is projected to average about 2 percent of GDP per annum over the next few years. In particular, the DSA includes the assumption that US$1 billion in new non-concessional financing will be contracted by end 2010/11 to finance the purchase of ships and the Gibe dam. Over the long term, non-concessional financing falls to ½ percent of GDP, and this contributes to a rising share of total borrowing needs so the grant element of new borrowing falls.

The **reserves** coverage remains at low levels for the next few years and then dips to almost 2 months of imports by 2018/19 on account of the large debt repayments during this period. After this payment hump, the reserve coverage gradually rises to 4 months of imports by 2029/30.

[7]For details regarding reforms to improve investment climate, see World Bank, Ethiopia: Investment Climate Report (2010).

Table 1. Comparison of Indicators of PPG External Debt: Baseline Scenario

	2008/09	2009/10	2010/11	2011/12	2012/13	2020/21	2025/26
				PV of debt to exports ratio			
2009DSA	84.4	136.8	139.0	131.6	118.8	51.1	37.9
2010DSA	86.7	119.1	132.7	129.0	118.5	53.2	35.5
				PV of debt to GDP ratio			
2009DSA	8.0	14.8	17.6	18.5	18.4	11.1	9.0
2010DSA	9.1	13.5	17.0	18.3	18.7	14.2	11.3
				PV of debt to revenue ratio			
2009DSA	60.0	105.1	122.3	123.5	121.4	73.8	59.7
2010DSA	65.4	93.1	122.5	122.4	124.0	94.9	75.4
				Debt service to exports ratio			
2009DSA	2.0	7.4	8.5	10.3	10.7	4.9	2.6
2010DSA	1.3	3.6	5.7	7.1	7.7	4.8	2.9

C. Baseline and Sensitivity Tests with Remittances

8. **Under the baseline scenario with remittances, public and publicly guaranteed external debt rises during the next few years, but remains considerably below the corresponding threshold**. The PV of debt to exports and remittances is projected to peak at 89 percent in 2011/12, compared to a threshold of 135 percent. The debt service ratio with respect to exports and remittances remains below the threshold of 18 percent of exports and remittances, but is projected to rise to about 6 percent over the next few years as a large fraction of new public enterprises borrowing is repaid.

9. **Three stress tests breach the indicative threshold for the PV of debt to exports and remittances over the forecast horizon**. These stress tests include export growth slower than the historical average by one standard deviation, net non-debt creating flows (FDI and current transfers) that are assumed lower than the historical average by one standard deviation and a combination of shocks. However, in all three cases the PV of debt to exports and workers' remittances only breaches the threshold for a maximum of two years (the scenario that combines various shocks).

10. **The debt profile is very sensitive to assumptions about export growth**. The baseline scenario for the export shock includes Ethiopia's drought experience in 2001/02. Since then, exports have grown persistently fast and no significant drought has reemerged. If we assume a structural break in export performance since 2001/02 and use a 7-year average for the historical export growth, a one standard deviation shock to the 7-year historical export growth rate over two years would raise export growth to 12 percent (relative to a negative growth rate in two consecutive years under the baseline stress test) and lower the PV of debt to exports and remittances to about 104 percent in

2011/12, safely below the threshold. However, even with this stronger export performance, the threshold is breached once under the combined stress test.

11. **In sum, Ethiopia's debt risk has been revised from a moderate to low risk rating**. Various reasons support this changes: (i) threshold breaches without using gross workers' remittances are not protracted (i.e., less than 10 years); (ii) all baseline and stress tests that include workers' remittances are well below the thresholds in all but one debt burden indicator, namely debt-to-exports plus remittances; (iii) threshold breaches under the latter only occur in three instances and for a maximum of two years; and (iv) the shocks are financed using a significant amount of non-concessional financing, which means that the debt trajectory after the stress represents an upper bound.

D. Fiscal Sustainability Analysis

12. **Under the baseline, public domestic debt in terms of GDP will continue to decline**. Despite significant borrowing by some of the largest public enterprises in 2009/10, domestic financing of the general government has been contained 0.7 percent of GDP.[8] Moreover, financing needs for some infrastructure developments (for example, electric power generation) by public enterprises have subsided. Consequently, public sector domestic debt is projected to decline to 21 percent of GDP by end 2009/10, down by about 1 percentage points from a year ago.

13. **With the increase in external debt, Ethiopia's public debt burden (including domestic debt) is expected to increase slightly, before trending down over the projected period**. The domestic debt profile is based on two assumptions: (i) domestic financing will be maintained at 1.0–1.5 percent of GDP per year, and (ii) annual T-bill yields will gradually increase to positive levels in real terms. While rising in the short-run, the PV of debt-to-GDP ratio is projected to peak at about 37 percent in 2010/11 and then gradually decline to 22 percent over the long term (Figure 2). The PV of debt to revenue ratio is projected to reach 195 percent by 2010/11 and then fall below 134 percent after 2021/22.

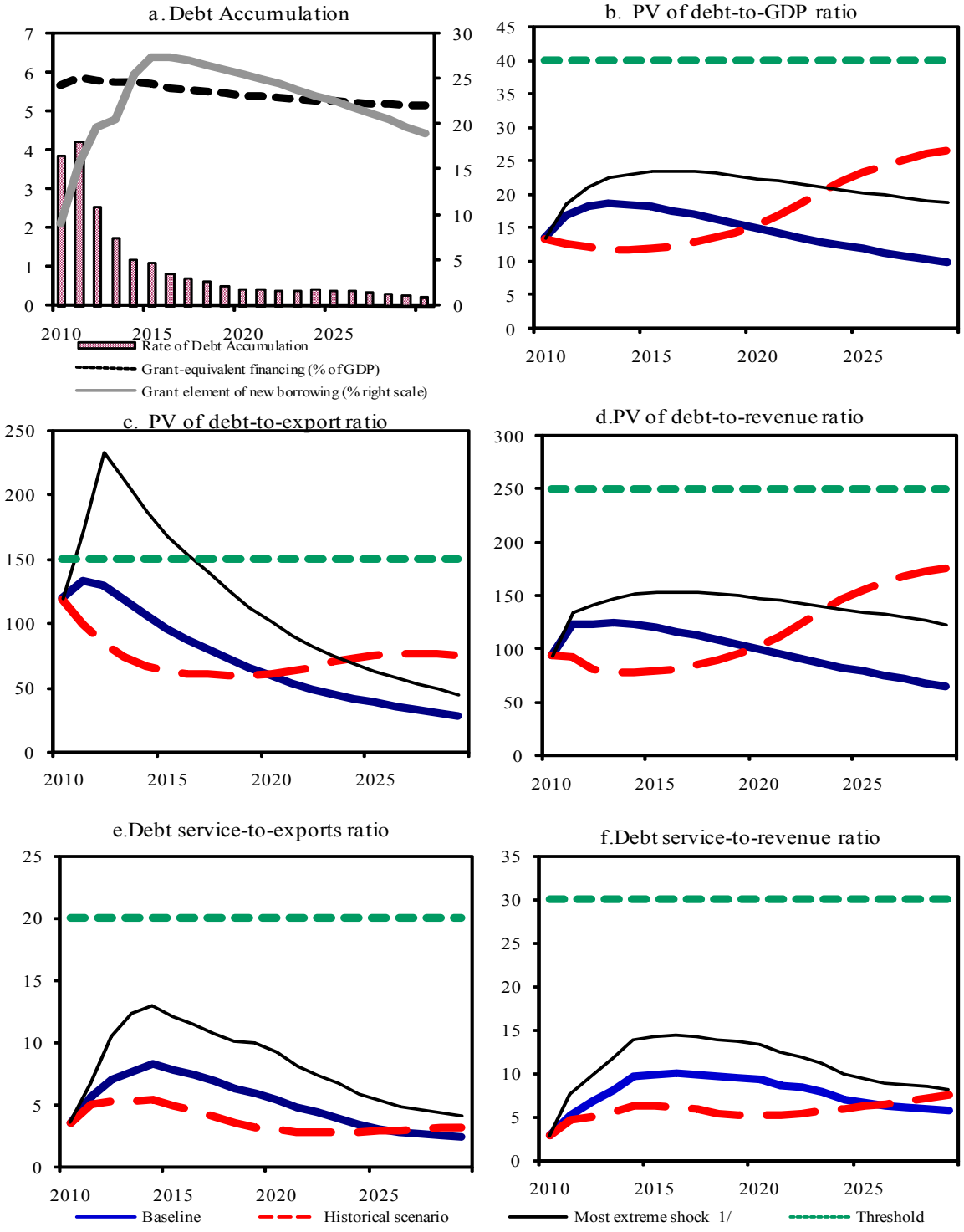
14. **Some stress tests show that the PV of debt to GDP will reach to a maximum of 57 percent of GDP during the projected period**. If the real GDP growth slows down by 1 standard deviation from historical average for two years, the PV of debt-to-GDP ratio would exceed 40 percent in the next few years before trending down during the projected period. A temporary shock to primary balances (historical average minus one standard deviation in 2011/12) would raise the debt ratio to 44 percent in 2011/12. Furthermore, with real GDP growth and primary deficits at historical levels, the debt-to-GDP ratio would increase gradually, exceeding 50 percent, over the projected period. The PV of debt-to-revenue ratio would follow a similar path. These results highlight the importance of maintaining the growth momentum while continuing with adjustment efforts to correct the macroeconomic imbalances.

[8] With good revenue performance, domestic financing target for 2009/10 has been reduced by 50 percent from the amount envisaged under the original budget.

IV. CONCLUSION

15. **Ethiopia's debt distress level has been lowered to a low risk rating through the use of a new metric for debt sustainability that includes gross workers' remittances as an important source of debt service financing**. Using this metric, no stress test breaches the indicative threshold for the PV of debt to exports and workers' remittances over the forecast horizon for more than two years, compared to considerably longer stress test breaches for the standard analysis that excludes workers' remittances. Notwithstanding this fact, the debt ratio has risen rapidly in recent years and is projected to continue to do so, underlining the importance for Ethiopia to keep a close tab on debt vulnerabilities and make utmost efforts to secure grant and concessional financing for its ambitious public enterprise investment plans. Moreover, while solvency risks appear remote, liquidity risks remain prevalent as indicated by the low reserve coverage ratio over the next ten years. Going forward, continued emphasis should be placed on strengthening debt management capacity by closely monitoring the debts of the largest public enterprises, assessing potential contingent liabilities and undertaking some kind of a debt management and performance assessment exercise. Finally, the increase in FDI flows in the midst of the global slowdown is welcome and there is considerable scope to attract more FDI flows and increase export potential by undertaking structural reforms that will reduce liquidity risks going forward.

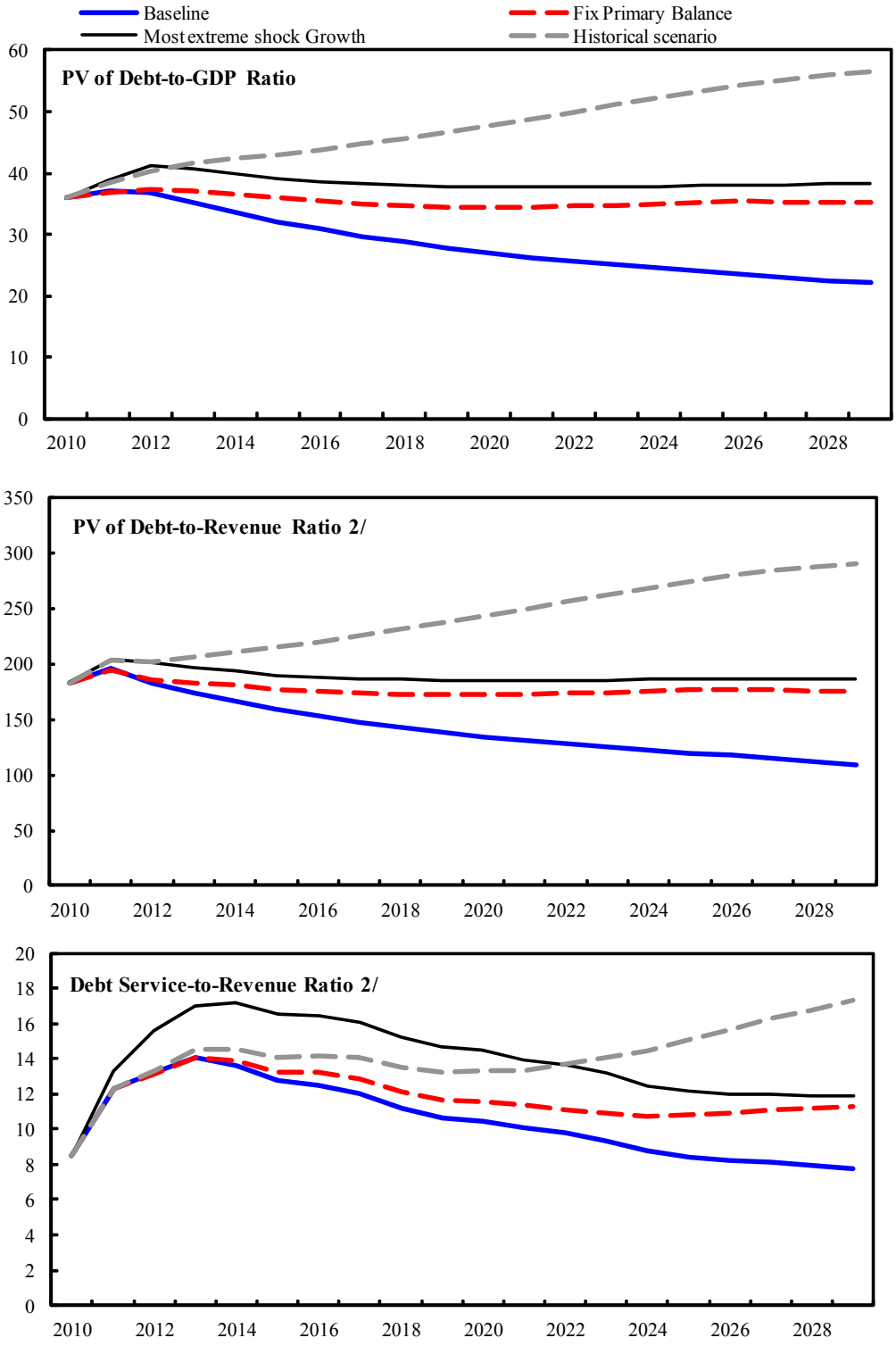
Figure 1. Ethiopia: Indicators of Public and Publicly Guaranteed External Debt under Alternatives Scenarios, 2010-2030 1/



Sources: Ethiopian authorities; and IMF and World Bank staff estimates and projections.

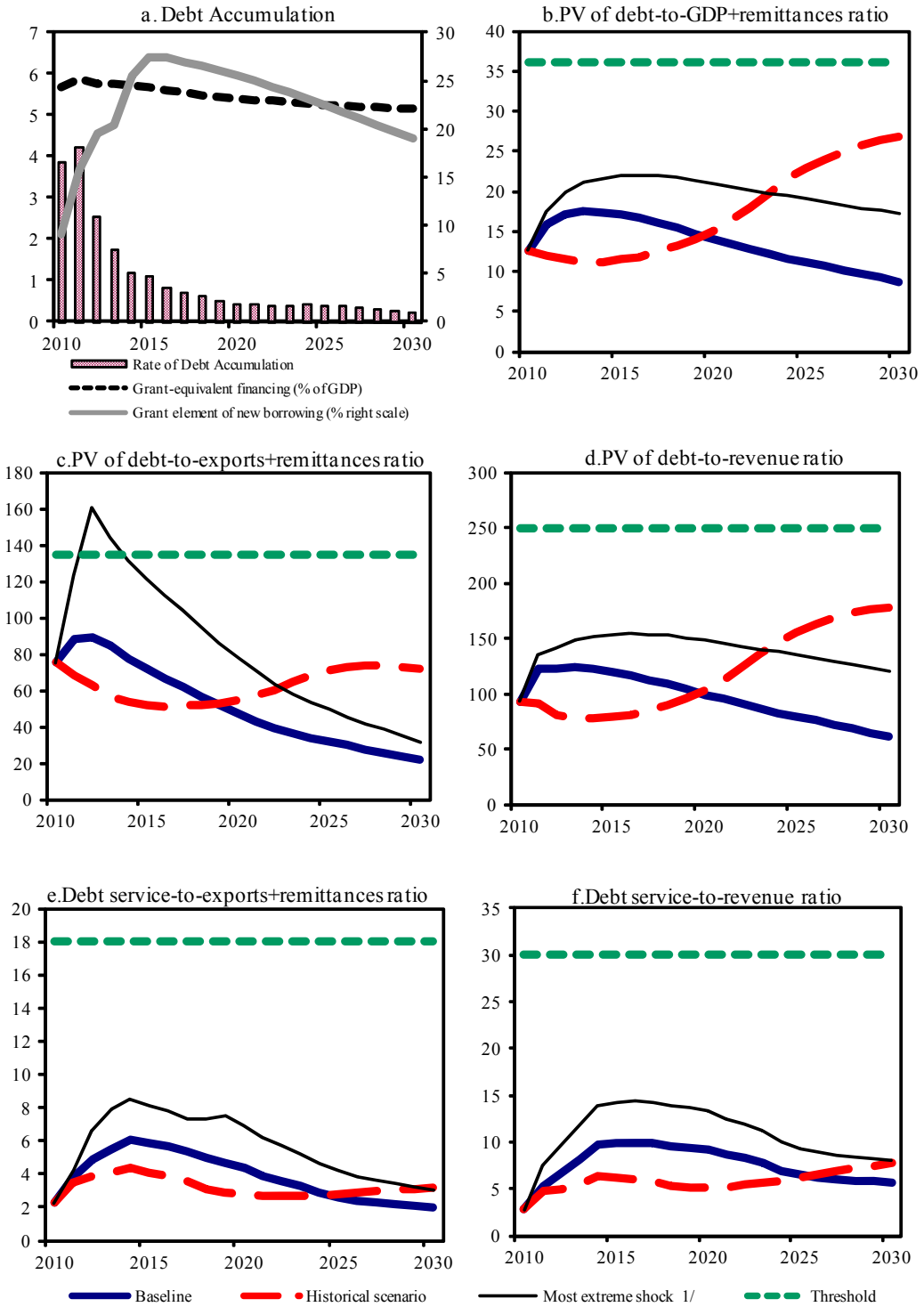
1/ The most extreme stress test is the test that yields the highest ratio in 2020. In figure b. it corresponds to a Terms shock; in c. to a Exports shock; in d. to a Terms shock; in e. to a Exports shock and in figure f. to a One-time depreciation shock

Figure 2.Ethiopia: Indicators of Public Debt Under Alternative Scenarios, 2010-2030 1/



Sources: Ethiopian authorities; and IMF and World Bank staff estimates and projections.
1/ The most extreme stress test is the test that yields the highest ratio in 2020.
2/ Revenues are defined inclusive of grants.

Figure 3. Ethiopia: Indicators of Public and Publicly Guaranteed External Debt under Alternatives Scenarios, 2010-2030 1/



Sources: Ethiopian authorities; and IMF and World Bank staff estimates and projections.

1/ The most extreme stress test is the test that yields the highest ratio in 2020. In figure b. it corresponds to a Terms shock; in c. to a Combination shock; in d. to a Terms shock; in e. to a Combination shock and in figure f. to a One-time depreciation shock

Table 1a.: External Debt Sustainability Framework, Baseline Scenario, 2007-2030 1/
(In percent of GDP, unless otherwise indicated)

	Actual			Historical Average	Standard Deviation	Projections									
												2010-2015			2016-2030
	2007	2008	2009			2010	2011	2012	2013	2014	2015	Average	2020	2030	Average
External debt (nominal) 1/	**12.1**	**11.7**	**14.1**			**19.0**	**24.1**	**27.2**	**28.6**	**29.3**	**29.6**		**23.0**	**12.7**	
o/w public and publicly guaranteed (PPG)	10.7	10.8	13.4			18.1	21.2	23.0	23.4	23.4	23.4		20.2	12.7	
Change in external debt	-29.6	-0.4	2.4			4.9	5.1	3.1	1.4	0.6	0.4		-1.6	-0.7	
Identified net debt-creating flows	-7.4	-0.7	0.2			3.2	4.2	2.2	1.1	0.1	-0.3		-2.6	-2.9	
Non-interest current account deficit	**4.3**	**5.5**	**4.9**	**3.8**	**3.1**	**7.4**	**8.7**	**6.8**	**5.7**	**4.8**	**4.5**		**2.1**	**1.8**	2.0
Deficit in balance of goods and services	19.3	19.6	18.1			21.3	22.4	20.8	19.7	18.6	17.9		14.4	12.2	
Exports	12.7	11.5	10.5			11.3	12.8	14.2	15.8	17.5	19.1		25.4	36.5	
Imports	32.1	31.0	28.6			32.6	35.2	35.0	35.5	36.0	37.0		39.8	48.7	
Net current transfers (negative = inflow)	-14.8	-13.9	-13.2	-12.5	2.2	-13.9	-13.6	-13.6	-13.8	-13.6	-13.4		-13.4	-13.4	-13.4
o/w official	-6.1	-4.9	-4.9			-5.2	-5.1	-5.1	-5.2	-5.1	-5.0		-5.0	-5.0	
Other current account flows (negative = net inflow)	-0.2	-0.2	0.0			0.0	-0.1	-0.4	-0.2	-0.1	0.0		1.2	3.0	
Net FDI (negative = inflow)	**-2.5**	**-3.1**	**-2.7**	**-2.0**	**0.6**	**-3.4**	**-3.5**	**-3.5**	**-3.5**	**-3.5**	**-3.5**		**-3.5**	**-4.0**	-3.8
Endogenous debt dynamics 2/	**-9.2**	**-3.1**	**-1.9**			**-0.7**	**-1.0**	**-1.1**	**-1.2**	**-1.2**	**-1.3**		**-1.2**	**-0.7**	
Contribution from nominal interest rate	0.2	0.1	0.1			0.3	0.4	0.6	0.8	0.8	0.8		0.6	0.3	
Contribution from real GDP growth	-3.8	-1.0	-1.0			-1.0	-1.4	-1.7	-1.9	-2.0	-2.1		-1.8	-1.0	
Contribution from price and exchange rate changes	-5.6	-2.2	-1.1			…	…	…	…	…	…		…	…	
Residual (3-4) 3/	**-22.3**	**0.3**	**2.1**			**1.7**	**0.9**	**0.9**	**0.4**	**0.5**	**0.7**		**1.0**	**2.2**	
o/w exceptional financing	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
PV of external debt 4/	…	…	9.7			14.4	19.8	22.5	23.9	24.3	24.4		17.7	9.3	
In percent of exports	…	…	93.1			127.5	155.1	158.6	151.2	139.0	127.9		69.7	25.5	
PV of PPG external debt	**…**	**…**	**9.1**			**13.5**	**17.0**	**18.3**	**18.7**	**18.5**	**18.2**		**14.9**	**9.3**	
In percent of exports	**…**	**…**	**86.7**			**119.1**	**132.7**	**129.0**	**118.5**	**105.7**	**95.1**		**58.8**	**25.5**	
In percent of government revenues	**…**	**…**	**65.4**			**93.1**	**122.5**	**122.4**	**124.0**	**122.4**	**119.2**		**99.2**	**61.1**	
Debt service-to-exports ratio (in percent)	**3.6**	**2.9**	**2.4**			**4.9**	**6.7**	**8.7**	**10.5**	**11.6**	**11.5**		**8.1**	**2.3**	
PPG debt service-to-exports ratio (in percent)	**1.2**	**1.3**	**1.3**			**3.6**	**5.7**	**7.1**	**7.7**	**8.3**	**7.8**		**5.5**	**2.3**	
PPG debt service-to-revenue ratio (in percent)	**1.3**	**1.1**	**1.0**			**2.8**	**5.2**	**6.7**	**8.1**	**9.6**	**9.8**		**9.3**	**5.6**	
Total gross financing need (Billions of U.S. dollars)	0.4	0.7	0.8			1.4	2.0	1.6	1.4	1.3	1.4		0.4	-1.8	
Non-interest current account deficit that stabilizes debt ratio	33.9	5.9	2.5			2.4	3.7	3.7	4.3	4.2	4.1		3.7	2.5	
Key macroeconomic assumptions															
Real GDP growth (in percent)	11.8	11.2	9.9	8.6	4.9	7.0	7.7	7.5	7.5	7.7	7.7	7.5	7.8	7.8	7.8
GDP deflator in US dollar terms (change in percent)	15.3	22.7	10.2	6.9	9.6	-10.3	-3.1	-0.8	-0.7	0.1	0.1	-2.4	0.0	-0.3	-0.1
Effective interest rate (percent) 5/	0.5	1.4	1.0	0.9	0.4	2.0	2.0	2.6	3.0	3.1	3.0	2.6	2.6	2.1	2.4
Growth of exports of G&S (US dollar terms, in percent)	18.2	22.9	10.5	15.0	15.3	3.7	17.9	18.3	19.2	19.2	17.7	16.0	13.5	11.3	12.5
Growth of imports of G&S (US dollar terms, in percent)	13.0	32.1	11.6	18.2	14.8	9.3	12.7	5.9	8.6	9.3	10.7	9.4	9.3	10.1	9.7
Grant element of new public sector borrowing (in percent)	…	…	…	…	…	9.1	15.7	19.6	20.5	25.5	27.4	19.6	25.5	19.0	23.6
Government revenues (excluding grants, in percent of GDP)	12.0	12.9	13.9			14.5	13.8	14.9	15.1	15.1	15.2		15.1	15.2	15.1

Sources: Ethiopian authorities; and IMF and World Bank staff estimates and projections.

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 PV of private sector debt is equivalent to its face value.

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

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

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

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

Table 1b.Ethiopia: Sensitivity Analysis for Key Indicators of Public and Publicly Guaranteed External Debt, 2010-2030
(In percent)

	Projections							
	2010	2011	2012	2013	2014	2015	**2020**	2030
PV of debt-to GDP ratio								
Baseline	13	17	18	18.7	18	18	**15**	9
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2010-2030 1/	13	13	12	12	12	12	**15**	27
A2. New public sector loans on less favorable terms in 2010-2030 2	13	19	21	22	22.9	23.3	**22**	18
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2011-2012	13	18	20	20	20	19	**16**	10
B2. Export value growth at historical average minus one standard deviation in 2011-2012 3/	13	19	24	24	23	23	**18**	11
B3. US dollar GDP deflator at historical average minus one standard deviation in 2011-2012	13	17	19	19	19	18	**15**	9
B4. Net non-debt creating flows at historical average minus one standard deviation in 2011-2012 4/	13	22	28	28	27	27	**21**	12
B5. Combination of B1-B4 using one-half standard deviation shocks	13	20	26	26	26	25	**20**	11
B6. One-time 30 percent nominal depreciation relative to the baseline in 2011 5/	13	25	26	27	27	26	**21**	13
PV of debt-to-exports ratio								
Baseline	119	133	129	119	106	95	**59**	26
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2010-2030 1/	119	99	86	74	67	63	**61**	74
A2. New public sector loans on less favorable terms in 2010-2030 2	119	146	149	142	131	122	**88**	50
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2011-2012	119	133	129	118	105	95	**58**	25
B2. Export value growth at historical average minus one standard deviation in 2011-2012 3/	119	173	233	211	187	168	**101**	40
B3. US dollar GDP deflator at historical average minus one standard deviation in 2011-2012	119	133	129	118	105	95	**58**	25
B4. Net non-debt creating flows at historical average minus one standard deviation in 2011-2012 4/	119	171	197	177	157	140	**83**	32
B5. Combination of B1-B4 using one-half standard deviation shocks	119	181	234	211	187	167	**100**	38
B6. One-time 30 percent nominal depreciation relative to the baseline in 2011 5/	119	133	129	118	105	95	**58**	25
PV of debt-to-revenue ratio								
Baseline	93	123	122	124	122	119	**99**	61
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2010-2030 1/	93	92	81	78	78	79	**103**	178
A2. New public sector loans on less favorable terms in 2010-2030 2	93	135	141	148	152	153	**148**	120
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2011-2012	93	127	132	133	131	128	**106**	65
B2. Export value growth at historical average minus one standard deviation in 2011-2012 3/	93	135	158	158	155	150	**122**	69
B3. US dollar GDP deflator at historical average minus one standard deviation in 2011-2012	93	122	124	125	124	120	**100**	61
B4. Net non-debt creating flows at historical average minus one standard deviation in 2011-2012 4/	93	158	187	186	181	175	**141**	76
B5. Combination of B1-B4 using one-half standard deviation shocks	93	147	174	173	169	164	**132**	71
B6. One-time 30 percent nominal depreciation relative to the baseline in 2011 5/	93	177	177	179	176	172	**142**	87

Table 1b.Ethiopia: Sensitivity Analysis for Key Indicators of Public and Publicly Guaranteed External Debt, 2010-2030 (concluded)
(In percent)

	Projections							
	2010	2011	2012	2013	2014	2015	2020	2030
Debt service-to-exports ratio								
Baseline	4	6	7	8	8	8	**5**	2
A. Alternative Scenarios								
A2. New public sector loans on less favorable terms in 2010-2030 2	4	6	6	6	6	7	**6**	4
A3. Alternative Scenario :[Costumize, enter title]	4	5	7	7	8	7	**4**	-1
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2011-2012	4	6	7	8	8	8	**5**	2
B2. Export value growth at historical average minus one standard deviation in 2011-2012 3/	4	7	10	12	13	12	**9**	4
B3. US dollar GDP deflator at historical average minus one standard deviation in 2011-2012	4	6	7	8	8	8	**5**	2
B4. Net non-debt creating flows at historical average minus one standard deviation in 2011-2012 4/	4	6	8	10	10	9	**7**	3
B5. Combination of B1-B4 using one-half standard deviation shocks	4	6	10	12	12	11	**9**	4
B6. One-time 30 percent nominal depreciation relative to the baseline in 2011 5/	4	6	7	8	8	8	**5**	2
Debt service-to-revenue ratio								
Baseline	3	5	7	8	10	10	**9**	6
A. Alternative Scenarios								
A2. New public sector loans on less favorable terms in 2010-2030 2	3	5	6	7	7	9	**9**	8
A3. Alternative Scenario :[Costumize, enter title]	3	5	6	7	9	9	**6**	-2
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2011-2012	3	5	7	9	10	11	**10**	6
B2. Export value growth at historical average minus one standard deviation in 2011-2012 3/	3	5	7	9	11	11	**11**	7
B3. US dollar GDP deflator at historical average minus one standard deviation in 2011-2012	3	5	7	8	10	10	**9**	6
B4. Net non-debt creating flows at historical average minus one standard deviation in 2011-2012 4/	3	5	8	10	12	12	**13**	7
B5. Combination of B1-B4 using one-half standard deviation shocks	3	5	7	10	11	11	**12**	7
B6. One-time 30 percent nominal depreciation relative to the baseline in 2011 5/	3	8	10	12	14	14	**13**	8
Memorandum item:								
Grant element assumed on residual financing (i.e., financing required above baseline) 6/	11	11	11	11	11	11	**11**	11

Sources: Ethiopian authorities; and IMF and World Bank staff estimates and projections.

1/ Variables include real GDP growth, growth of GDP deflator (in U.S. dollar terms), non-interest current account in percent of GDP, and non-debt creating flows.
2/ Assumes that the interest rate on new borrowing is by 2 percentage points higher than in the baseline., while grace and maturity periods are the same as in the baseline.
3/ Exports values are assumed to remain permanently at the lower level, but the current account as a share of GDP is assumed to return to its baseline level after the shock (implicitly assuming an offsetting adjustment in import levels).
4/ Includes official and private transfers and FDI.
5/ Depreciation is defined as percentage decline in dollar/local currency rate, such that it never exceeds 100 percent.
6/ Applies to all stress scenarios except for A2 (less favorable financing) in which the terms on all new financing are as specified in footnote 2.

Table 2a.Ethiopia: Public Sector Debt Sustainability Framework, Baseline Scenario, 2007-2030
(In percent of GDP, unless otherwise indicated)

	Actual					Estimate						Projections				
	2007	2008	2009	Average	Standard Deviation	2010	2011	2012	2013	2014	2015	2010-15 Average	2020	2025	2030	2016-30 Average
Public sector debt 1/	42.7	38.9	35.4			39.3	40.6	40.7	39.5	38.0	36.7		31.7	28.0	24.7	
o/w foreign-currency denominated	10.7	10.8	13.4			18.1	21.2	23.0	23.4	23.4	23.4		20.2	16.2	12.7	
Change in public sector debt	-27.8	-3.8	-3.5			4.0	1.3	0.0	-1.2	-1.5	-1.3		-0.9	-0.7	-0.6	
Identified debt-creating flows	-11.0	-6.1	-6.5			0.6	-1.8	-1.4	-2.1	-1.9	-1.6		-1.1	-1.0	-0.4	
Primary deficit	4.3	6.7	1.9	4.0	1.7	2.0	2.1	1.2	0.6	0.6	0.8	1.2	0.8	0.7	1.0	0.9
Revenue and grants	18.1	17.8	18.7			19.7	18.9	20.0	20.3	20.2	20.2		20.1	20.0	20.2	
of which: grants	6.1	4.9	4.9			5.2	5.1	5.1	5.2	5.1	5.0		5.0	5.0	5.0	
Primary (noninterest) expenditure	22.5	24.5	20.7			21.7	21.1	21.2	20.9	20.8	21.1		20.9	20.7	21.3	
Automatic debt dynamics	-14.7	-12.0	-8.1			-1.2	-3.9	-2.6	-2.6	-2.5	-2.5		-1.9	-1.7	-1.5	
Contribution from interest rate/growth differential	-11.7	-10.4	-7.9			-3.0	-3.8	-3.2	-3.0	-2.9	-2.8		-2.3	-2.0	-1.7	
of which: contribution from average real interest rate	-4.2	-6.1	-4.4			-0.7	-1.0	-0.4	-0.1	-0.1	-0.1		0.1	0.1	0.1	
of which: contribution from real GDP growth	-7.4	-4.3	-3.5			-2.3	-2.8	-2.8	-2.8	-2.8	-2.7		-2.4	-2.1	-1.8	
Contribution from real exchange rate depreciation	-3.1	-1.6	-0.2			1.7	0.0	0.6	0.4	0.4	0.4		...	...	...	
Other identified debt-creating flows	-0.6	-0.8	-0.3			-0.1	-0.1	0.0	0.0	0.0	0.0		0.0	0.0	0.0	
Privatization receipts (negative)	0.0	-0.4	-0.1			-0.1	-0.1	0.0	0.0	0.0	0.0		0.0	0.0	0.0	
Recognition of implicit or contingent liabilities	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	
Debt relief (HIPC and other)	-0.6	-0.4	-0.2			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	0.0	
Residual, including asset changes	-16.7	2.3	3.0			3.4	3.1	1.4	0.9	0.4	0.3		0.2	0.3	-0.2	
Other Sustainability Indicators																
PV of public sector debt	32.0	28.1	31.8			35.9	37.0	36.7	35.3	33.6	32.1		26.9	23.9	21.6	
o/w foreign-currency denominated	0.0	0.0	9.9			14.7	17.5	19.0	19.3	19.0	18.7		15.4	12.2	9.6	
o/w external	...	...	9.9			14.7	17.5	19.0	19.3	19.0	18.7		15.4	12.2	9.6	
PV of contingent liabilities (not included in public sector debt)	...	...	...			...	...	...	...	...	...		...	...	...	
Gross financing need 2/	5.2	7.7	3.7			3.7	4.5	3.8	3.4	3.4	3.4		2.9	2.4	2.6	
PV of public sector debt-to-revenue and grants ratio (in percent)	176.6	157.6	169.8			182.7	195.4	183.1	174.0	166.3	158.3		134.2	119.7	106.8	
PV of public sector debt-to-revenue ratio (in percent)	266.8	217.1	229.5			248.5	267.1	245.6	233.8	222.5	210.2		178.7	159.7	141.8	
o/w external 3/	…	…	71.2			101.4	126.7	127.1	127.6	125.9	122.6		102.1	81.2	62.9	
Debt service-to-revenue and grants ratio (in percent) 4/	4.8	5.5	9.4			8.5	12.3	13.2	14.0	13.6	12.7		10.4	8.4	7.6	
Debt service-to-revenue ratio (in percent) 4/	7.3	7.6	12.7			11.6	16.9	17.7	18.9	18.2	16.9		13.9	11.3	10.1	
Primary deficit that stabilizes the debt-to-GDP ratio	32.1	10.5	5.5			-2.0	0.8	1.1	1.8	2.1	2.1		1.8	1.4	1.7	
Key macroeconomic and fiscal assumptions																
Real GDP growth (in percent)	11.8	11.2	9.9	8.6	4.9	7.0	7.7	7.5	7.5	7.7	7.7	7.5	7.8	7.8	7.8	7.8
Average nominal interest rate on forex debt (in percent)	0.3	0.9	0.7	0.8	0.4	1.8	1.8	2.4	2.7	2.8	2.7	2.4	2.3	2.1	2.1	2.2
Average real interest rate on domestic debt (in percent)	-12.4	-20.9	-16.6	-6.0	9.6	-3.1	-5.3	-2.5	-1.9	-1.8	-2.2	-2.8	-0.2	0.7	0.7	0.2
Real exchange rate depreciation (in percent, + indicates depreciation	-8.9	-16.8	-2.4	-3.5	8.0	13.6	...	...	...	...	...	...	...	...	...	...
Inflation rate (GDP deflator, in percent)	16.9	30.0	23.0	10.5	10.9	7.2	9.3	6.6	6.3	6.1	6.1	6.9	6.0	6.0	5.7	5.9
Growth of real primary spending (deflated by GDP deflator, in percer	0.2	0.2	-0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Grant element of new external borrowing (in percent)	...	...	...	…	…	9.1	15.7	19.6	20.5	25.5	27.4	19.6	25.5	22.5	19.0	...

Sources: Ethiopian authorities; and IMF and World Bank 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 2b.Ethiopia: Sensitivity Analysis for Key Indicators of Public Debt 2010-2030

	Projections							
	2010	2011	2012	2013	2014	2015	2020	2030
PV of Debt-to-GDP Ratio								
Baseline	36	37	37	35	34	32	27	22
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	36	38	40	41	42	43	48	57
A2. Primary balance is unchanged from 2010	36	37	37	37	37	36	34	35
A3. Permanently lower GDP growth 1/	36	37	38	37	36	36	37	53
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2011-2012	36	39	41	41	40	39	38	38
B2. Primary balance is at historical average minus one standard deviations in 2011-2012	36	40	44	42	40	39	32	25
B3. Combination of B1-B2 using one half standard deviation shocks	36	40	43	42	41	39	35	30
B4. One-time 30 percent real depreciation in 2011	36	43	43	41	39	38	33	28
B5. 10 percent of GDP increase in other debt-creating flows in 2011	36	46	46	44	42	40	34	26
PV of Debt-to-Revenue Ratio 2/								
Baseline	183	195	183	174	166	158	134	107
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	183	203	202	206	211	215	243	293
A2. Primary balance is unchanged from 2010	183	194	186	183	181	177	172	174
A3. Permanently lower GDP growth 1/	183	198	188	182	178	174	180	248
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2011-2012	183	204	201	196	193	189	185	186
B2. Primary balance is at historical average minus one standard deviations in 2011-2012	183	212	219	208	199	190	161	124
B3. Combination of B1-B2 using one half standard deviation shocks	183	210	215	206	199	192	171	148
B4. One-time 30 percent real depreciation in 2011	183	229	213	202	194	185	163	141
B5. 10 percent of GDP increase in other debt-creating flows in 2011	183	244	228	216	207	198	168	128
Debt Service-to-Revenue Ratio 2/								
Baseline	9	12	13	14	14	13	10	8
A. Alternative scenarios								
A1. Real GDP growth and primary balance are at historical averages	9	12	13	14	15	14	13	18
A2. Primary balance is unchanged from 2010	9	12	13	14	14	13	12	11
A3. Permanently lower GDP growth 1/	9	12	13	14	14	13	12	14
B. Bound tests								
B1. Real GDP growth is at historical average minus one standard deviations in 2011-2012	9	13	14	15	15	14	12	12
B2. Primary balance is at historical average minus one standard deviations in 2011-2012	9	12	14	15	15	14	11	9
B3. Combination of B1-B2 using one half standard deviation shocks	9	12	14	15	15	14	12	11
B4. One-time 30 percent real depreciation in 2011	9	13	16	17	17	17	14	12
B5. 10 percent of GDP increase in other debt-creating flows in 2011	9	12	15	16	15	14	12	10

Sources: Ethiopian authorities; and IMF and World Bank staff estimates and projections.
1/ Assumes that real GDP growth is at baseline minus one standard deviation divided by the square root of the length of the projection period.
2/ Revenues are defined inclusive of grants.

Table 3.Ethiopia: Sensitivity Analysis for Key Indicators of Public and Publicly Guaranteed External Debt, 2010-2030
(In percent)

	Projections							
	2010	2011	2012	2013	2014	2015	**2020**	2030
PV of debt-to-GDP+remittances ratio								
Baseline	13	16	17	18	17	17	**14**	9
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2010-2030 1/	13	12	12	11	11	12	**15**	27
A2. New public sector loans on less favorable terms in 2010-2030 2	13	17	20	21	22	22	**21**	17
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2011-2012	13	16	18	19	19	18	**15**	9
B2. Export value growth at historical average minus one standard deviation in 2011-2012 3/	13	18	22	22	22	22	**17**	10
B3. US dollar GDP deflator at historical average minus one standard deviation in 2011-2012	13	16	17	18	18	17	**14**	9
B4. Net non-debt creating flows at historical average minus one standard deviation in 2011-2012 4/	13	21	27	26	26	25	**20**	11
B5. Combination of B1-B4 using one-half standard deviation shocks	13	19	25	25	24	24	**19**	10
B6. One-time 30 percent nominal depreciation relative to the baseline in 2011 5/	13	22	24	25	24	24	**20**	12
PV of debt-to-exports+remittances ratio								
Baseline	75	88	89	84	77	72	**47**	22
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2010-2030 1/	75	68	62	57	53	52	**55**	72
A2. New public sector loans on less favorable terms in 2010-2030 2	75	97	103	101	96	92	**70**	43
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2011-2012	75	88	89	84	77	71	**47**	21
B2. Export value growth at historical average minus one standard deviation in 2011-2012 3/	75	108	143	134	124	115	**75**	33
B3. US dollar GDP deflator at historical average minus one standard deviation in 2011-2012	75	88	89	84	77	71	**47**	21
B4. Net non-debt creating flows at historical average minus one standard deviation in 2011-2012 4/	75	123	147	126	115	105	**67**	27
B5. Combination of B1-B4 using one-half standard deviation shocks	75	123	161	144	132	121	**78**	32
B6. One-time 30 percent nominal depreciation relative to the baseline in 2011 5/	75	88	89	84	77	71	**47**	21
PV of debt-to-revenue ratio								
Baseline	93	123	122	124	122	119	**99**	61
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2010-2030 1/	93	92	81	78	78	79	**103**	178
A2. New public sector loans on less favorable terms in 2010-2030 2	93	135	141	148	152	153	**148**	120
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2011-2012	93	127	132	133	131	128	**106**	65
B2. Export value growth at historical average minus one standard deviation in 2011-2012 3/	93	135	158	158	155	150	**122**	69
B3. US dollar GDP deflator at historical average minus one standard deviation in 2011-2012	93	122	124	125	124	120	**100**	61
B4. Net non-debt creating flows at historical average minus one standard deviation in 2011-2012 4/	93	158	187	186	181	175	**141**	76
B5. Combination of B1-B4 using one-half standard deviation shocks	93	147	174	173	169	164	**132**	71
B6. One-time 30 percent nominal depreciation relative to the baseline in 2011 5/	93	177	177	179	176	172	**142**	87

Table 3.Ethiopia: Sensitivity Analysis for Key Indicators of Public and Publicly Guaranteed External Debt, 2010-2030 (concluded)
(In percent)

	Projections							
	2010	2011	2012	2013	2014	2015	2020	2030
Debt service-to-exports+remittances ratio								
Baseline	2	4	5	5	6	6	**4**	2
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2010-2030 1/	2	3	4	4	4	4	**3**	3
A2. New public sector loans on less favorable terms in 2010-2030 2	2	4	4	5	5	5	**4**	3
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2011-2012	2	4	5	5	6	6	**4**	2
B2. Export value growth at historical average minus one standard deviation in 2011-2012 3/	2	4	6	8	9	8	**7**	3
B3. US dollar GDP deflator at historical average minus one standard deviation in 2011-2012	2	4	5	5	6	6	**4**	2
B4. Net non-debt creating flows at historical average minus one standard deviation in 2011-2012 4/	2	4	6	7	7	7	**6**	3
B5. Combination of B1-B4 using one-half standard deviation shocks	2	4	7	8	8	8	**7**	3
B6. One-time 30 percent nominal depreciation relative to the baseline in 2011 5/	2	4	5	5	6	6	**4**	2
Debt service-to-revenue ratio								
Baseline	3	5	7	8	10	10	**9**	6
A. Alternative Scenarios								
A1. Key variables at their historical averages in 2010-2030 1/	3	5	5	6	6	6	**5**	8
A2. New public sector loans on less favorable terms in 2010-2030 2	3	5	6	7	7	9	**9**	8
B. Bound Tests								
B1. Real GDP growth at historical average minus one standard deviation in 2011-2012	3	5	7	9	10	11	**10**	6
B2. Export value growth at historical average minus one standard deviation in 2011-2012 3/	3	5	7	9	11	11	**11**	7
B3. US dollar GDP deflator at historical average minus one standard deviation in 2011-2012	3	5	7	8	10	10	**9**	6
B4. Net non-debt creating flows at historical average minus one standard deviation in 2011-2012 4/	3	5	8	10	12	12	**13**	7
B5. Combination of B1-B4 using one-half standard deviation shocks	3	5	7	10	11	11	**12**	7
B6. One-time 30 percent nominal depreciation relative to the baseline in 2011 5/	3	8	10	12	14	14	**13**	8
Memorandum item:								
Grant element assumed on residual financing (i.e., financing required above baseline) 6/	11	11	11	11	11	11	**11**	11

Sources: Ethiopian authorities; and IMF and World Bank staff estimates and projections.

1/ Variables include real GDP growth, growth of GDP deflator (in U.S. dollar terms), non-interest current account in percent of GDP, and non-debt creating flows.
2/ Assumes that the interest rate on new borrowing is by 2 percentage points higher than in the baseline., while grace and maturity periods are the same as in the baseline.
3/ Exports values are assumed to remain permanently at the lower level, but the current account as a share of GDP is assumed to return to its baseline level after the shock (implicitly assuming an offsetting adjustment in import levels).
4/ Includes official and private transfers and FDI.
5/ Depreciation is defined as percentage decline in dollar/local currency rate, such that it never exceeds 100 percent.
6/ Applies to all stress scenarios except for A2 (less favorable financing) in which the terms on all new financing are as specified in footnote 2.