

## Debt Sustainability in Sub-Saharan Africa: Unraveling Country-Specific Risks

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Santiago, Noviembre de 2015

# DEBT SUSTAINABILITY IN SUB-SAHARAN AFRICA: UNRAVELING COUNTRY-SPECIFIC RISKS <sup>a/</sup>

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## ABSTRACT

*Sub-Saharan African countries as a group showed a considerable reduction in public and external indebtedness in the early 2000s as a result of debt relief programs, higher economic growth and improved fiscal management for some countries. More recently, however, vulnerabilities in some countries are on the rise, including a few with very rapid debt accumulation. This paper looks at the heterogeneous experiences across Sub-Saharan African countries and the detailed dynamics that have driven changes in public debt since the global financial crisis. Borrowing to support fiscal deficits since 2009, including through domestic markets and Eurobond issuance, has driven a net increase in public debt for all countries except oil exporters benefitting from buoyant commodity prices and fragile states receiving post-2008 HIPC relief. Current account deficits and FDI inflows drove the external debt dynamics, with high balance of payments problems associated with very rapid external debt accumulation in some cases. Pockets of increasing vulnerabilities of debt financing profiles and sensitivity of debt burden indicators to macro-fiscal shocks require close monitoring. Specific risks that policy-makers in Sub-Saharan Africa need to pay attention to going forward include the recent fall in oil prices, the slowdown in China and the sluggish recovery in Europe, dependence on non-debt creating flows and accounting for contingent liabilities.*

## KEYWORDS

Public debt, external debt, debt sustainability, Sub-Saharan Africa

## JEL CLASSIFICATION CODES

E63, F34, H63, H68

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a/ Paper prepared as background for World Bank (2015) “Feet on the Ground, Eyes on the Horizon: Assessing Vulnerability and Resilience in Sub-Saharan Africa” (manuscript, June).

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## Introduction

The fiscal and debt landscape has changed significantly for many Sub-Saharan African (SSA) countries since the onset of the global financial crisis in 2007-2008. Record low interest rates worldwide coupled with the lowest SSA debt levels in decades after successful HIPC and MDRI debt relief has led to increased access to new sources of finance, especially non-concessional. For some countries there has been a sharp rise in indebtedness within a short time period, which if unchecked can lead to debt overhang problems similar to the ones seen in past decades among LICs and MICs. Further, volatile and changing global economic and financial conditions warrant a close monitoring of country debt situations in SSA. This paper moves beyond the aggregate picture to look at more detailed debt profiles and dynamics of SSA countries, and aims to unravel more country-specific risks. The paper is structured as follows. Section 1 notes important data and methodology considerations. Section 2 presents an update on debt patterns in SSA countries, covering public debt and external debt separately. Section 3 reports post-global financial crisis debt dynamics, analyzing the underlying driving forces behind recent changes in debt burdens and comparing these factors with earlier periods. Section 4 discusses key vulnerabilities to debt sustainability in SSA countries, and Section 5 provides concluding remarks.

## Section 1. Data and Methodology

The paper draws on a number of data sources to conduct analyses. The analysis of debt stocks in Section 2 draws on World Development Indicators (WDI) data, which are available for a broad sample of 45 SSA countries during the period 1980-2013. Insights on debt dynamics in Section 3 and the latest picture on debt sustainability in Section 4 draw on a group of 33 SSA countries with recent joint World Bank / IMF debt sustainability analyses (DSAs) conducted in either 2013 and 2014 (see Annex Table 1 for this country list).

For the identification of debt sustainability risks, the methodology includes sensitivity analyses conducted through simulations to evaluate the impact of different macro-fiscal assumptions on a country's projected debt burden indicators, as well as looking into the recent changes in indebtedness as reported in the country's DSAs. In both applications the sample consists of the 33 SSA countries for which there is a 2013 or 2014 DSA, which aids cross-country comparisons both in terms of debt data coverage and results. Further, the DSA – a standardized check on liquidity and solvency risks faced by low income countries – uses a uniform macro-accounting framework which provides easy ways to implement changes in countries' macro-fiscal assumptions for the sensitivity analysis.<sup>1</sup>

The use of DSAs for the analysis in Sections 3 and 4, in which cut-off dates are at least 1 year old (see projection years in Annex Table 1), implies that recent developments affecting some countries' debt situation may not be properly captured in the vulnerability assessments. To the extent that other sources permit, we provide updates for such assessments, although those may lack the rigor of full DSAs.

Finally, the sample of 33 SSA countries with recent DSAs is representative of the SSA region as a whole. The countries with DSAs represent 86 percent of the larger sample in terms of total population. In terms of GDP the coverage is somehow lower because the small sample does not include Angola and most importantly South Africa, for both of which there is no DSA available. In terms of constant 2005 USD GDP the 33-country sample represents 53 percent of the larger sample, but 80 percent if excluding South Africa from the latter group.

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<sup>1</sup> For a detailed explanation of how a DSA is undertaken see Box 1.

### **Box 1: The Debt Sustainability Analysis (DSA) in a nutshell**

The World Bank and IMF periodically carry out DSA exercises, in which a country's debt is projected over a twenty years horizon, to assess whether such debt is on a sustainable path or, alternatively, the country faces a higher than advisable probability of debt distress over the projection period. The analysis applies mostly to low income countries and is undertaken using the Debt Sustainability Framework (DSF), a macro-accounting tool developed jointly by the World Bank and the IMF in the context of debt relief initiatives.

The DSF consists of the following three elements or blocks:

- a) A standard financial programming exercise to make projections of key macro variables (exports, imports, GDP, exchange rate, inflation, government revenues and expenditures, etc.) and the financing gaps faced by the country as a whole (current account balance) and by the government (government deficit);
- b) A set of dynamic deterministic equations used to project future debt and debt service as a function of past debt and its amortization profile, interest payments and the financing gaps projected in a) above;
- c) A set of country specific threshold indicating the maximum debt a country can carry for a given probability of debt distress.

It should be noted that the financial programming exercise, by which the key macro variables and financing gaps are projected, although a pre-requisite, is done outside the DSA and not strictly part of it. The financial programming exercise is usually the result of the country monitoring activities carried out by country economists in the Bank and in the Fund and imported into the DSA. Elements b) and c), on the other hand, are unique to the DSA.

As mentioned, component b) consists of a set of dynamic equations that project future debt and debt service as a function of past debt, its amortization profile, the accrual of interest and the financing gaps faced by the country or the government. However, to make such projections it is needed to assume going forward in what terms (currency, maturity and interest rate) the new debt will be contracted to finance future gaps.

Component c) consists of policy-dependent thresholds for five debt burden indicators, namely: (a) PV of debt-to-GDP ratio, (b) PV of debt to exports ratio, (c) PV of debt to government revenues ratio, (d) debt service to government revenues ratio, and (e) debt service to exports ratio. The thresholds are country specific because they depend on the quality of a country's institutions and policies (i.e., countries with stronger policies and institutions can carry more debt than countries with weaker institutions without falling into distress). The thresholds are for a pre-determined probability of debt distress set at about 15 percent and kept equal for all countries.

The assessment of the sustainability of a country's debt results from comparing the five indicators above vis-à-vis their corresponding thresholds under both a baseline and alternative scenarios. The baseline or most likely scenario is the one projected under the financial programming, while alternative scenarios are built by applying a set of predetermined shocks to the former. Depending on whether a country's debt burden indicators over the projection horizon breach the thresholds or not, for protracted or short periods, and whether this occurs under the baseline or alternative scenarios, the country is ranked as low, moderate or high risk of debt distress.

## Section 2. Historical Context

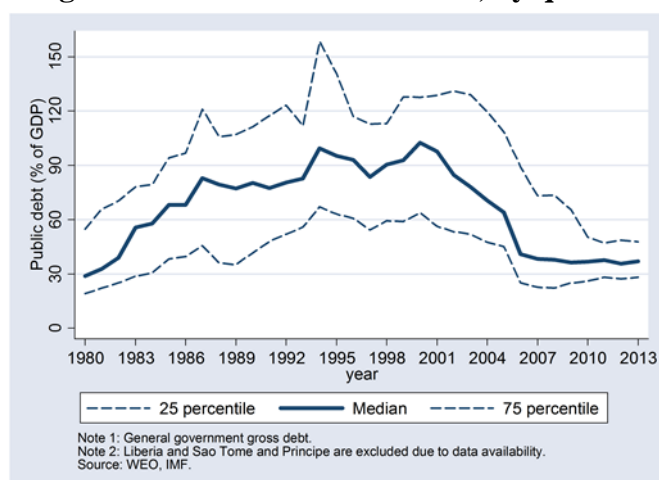
Before analyzing recent changes in indebtedness and assessing debt sustainability in SSA countries, this section looks at the evolution of public and external debt in the region with a long-term perspective, which helps to put recent debt dynamics into context. Measuring debt relative to repayment capacity for a sample of 45 SSA countries between 1980 and 2013, we first analyze the evolution of public and external debt for the whole sample and for specific country groups. In the last subsection we focus on recent episodes of rapid debt accumulation, which serves as an introduction to the analyses in Sections 3 and 4.

### 2.1 Public debt<sup>2</sup> patterns in SSA countries

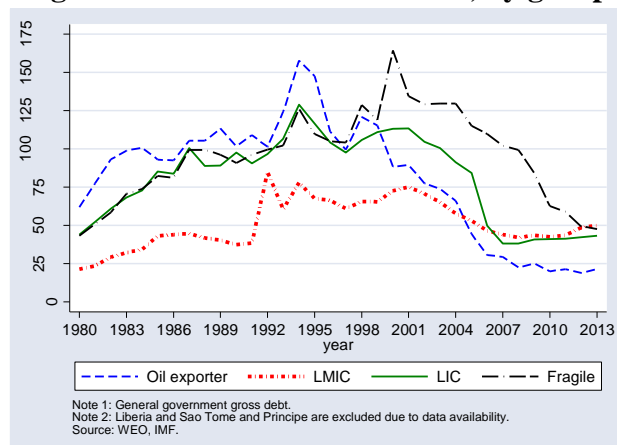
Figure 2.1 shows the public debt burden for SSA countries more than tripling between 1980 and 2000, before declining by 2006 to levels last seen in the early 1980s. The SSA public debt burden grew rapidly in the early 1980s, as the Latin American debt crisis spread to developing regions around the world, including Africa. Public debt as a share of GDP grew sharply from a median of 30 percent in 1980, to 83 percent in 1987. It continued to grow, but at a slower pace, until peaking at 103 percent in 2000. The combination of improved economic growth and the introduction of the HIPC and MDRI debt relief programs led to a significant drop in debt burden indicators of SSA countries from 2000 to 2006.

There are significant differences among country groupings. The large inter-quartile range in Figure 2.1 signals a high degree of heterogeneity among countries. Figure 2.2 distinguishes four non-overlapping groups of SSA countries by key characteristics: oil exporting, lower middle income (LMICs), low income (LICs), and fragile countries (for the country classification see Annex Figure 1). Public debt relative to GDP sharply increased for all country groups until 1986, and more slowly until the early 1990s after the debt crisis had manifested in full. The sharpest increase occurred in oil exporting countries because of the continuing drop in nominal output in tandem with the price of oil. Debt levels started to fall in 1994 in tandem with the observed faster economic growth across the board for all except fragile economies. The latter group did not see a sharp fall in public indebtedness until the early 2000s, when output growth accelerated and debt relief programs started having an effect. Debt relief also explains the sharp drop in LICs' indebtedness in the mid-2000s.

**Figure 2.1: Public debt evolution, by quartile**



**Figure 2.2: Public debt evolution, by group**



<sup>2</sup> "Public debt" refers to nominal gross debt owed by the general government, including both external and domestic obligations, unless otherwise noted.



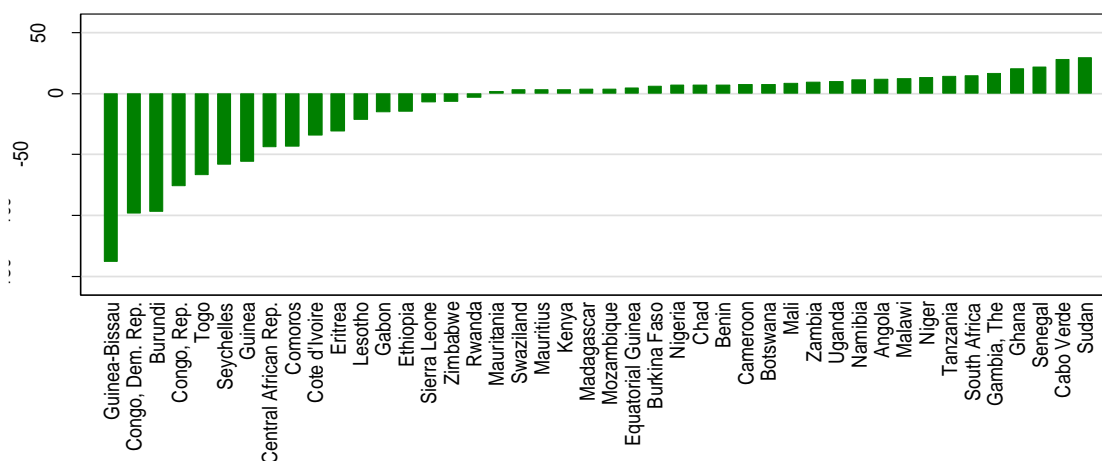
A country-specific look shows the full heterogeneity in shifting debt burdens. In 2013 SSA countries reported an average public and publicly guaranteed (PPG) debt-to-GDP ratio of 42 percent. This is a 12 percentage point drop from 2007 at the onset of the global financial crisis. However, as Table 2.1 shows, there is significant dispersion around that average as about 40 percent of the countries have a debt higher than 40 percent of GDP – as of end 2013, there are still countries reporting public debt above 90 percent of GDP, namely Cape Verde, Mauritania, Sudan and Eritrea (see Annex Figure 1). Further, Figure 2.3 shows that the 2013 average is heavily skewed by HIPCs that reached completion point after the crisis hit. This includes eight of the top 10 drops in indebtedness in Figure 2.3. For most of the countries in the sample (27 of 44), there is a small to moderate increase in public debt-to-GDP.

**Table 2.1: Public debt-to-GDP dispersion, 2013**

Public debt to GDP		Frequency	%
More than	Less than		
--	20	5	11%
20	30	9	20%
30	40	13	29%
40	50	9	20%
50	60	3	7%
60	70	--	--
70	80	2	4%
80	90	--	--
90	More	4	9%

Source: WEO / IMF.

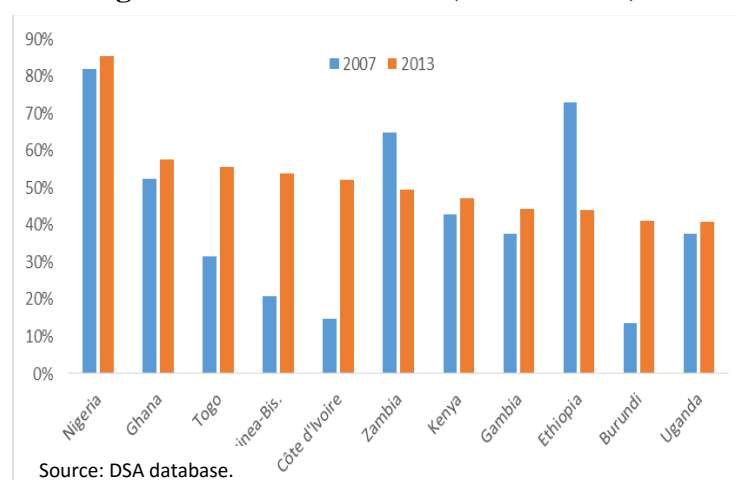
**Figure 2.3: Public debt-to-GDP: change between 2007 and 2013 (% points)**



Source: IMF, WEO/FAD.

Domestic debt comprises a large and growing share of total public debt for many countries. In 2013, domestic debt comprised on average about one-third of the total public debt burden across 31 SSA countries with available data, or roughly 14 percent of GDP<sup>3</sup>. Obligations to domestic creditors is currently 40 percent or more of public debt for 11 countries, and many of these countries reached this exposure recently due to much heavier reliance on domestic creditors for financing following the global financial crisis (Figure 2.4). Projections reflected in DSA analyses for all 31 countries suggest, however, that domestic debt is expected to fall as a share of public debt over the medium to long term.

**Figure 2.4: Domestic debt (% total debt)**



Source: DSA database.

<sup>3</sup> Data on domestic debt are not available in WDI or WEO. Statistics mentioned here are for 31 countries with DSAs completed in 2013-2014.

## 2.2 External debt<sup>4</sup> patterns in SSA countries

The largest component of public debt in SSA countries has been from external sources. The overall trend of external debt resembles the pattern for total public debt described in the previous subsection. External debt stocks increased sharply as a result of the 1980s debt crisis, remained relatively stable (albeit showing some volatility) for more than a decade and then started to sharply decrease in the early 2000s. The output recovery that starts in the early 2000s is different across groups: much faster for LMICs and oil exporters and much slower for fragile and LICs. However, the fall in indebtedness is similar across groups, which can be explained by debt relief (HIPC and MDRI) compensating for the low growth in fragile and LICs.

Debt relief helps explain the significant drop in external debt. The average amount of debt forgiveness from 1989 to 1998 was USD 3.8 billion, increasing with the introduction of HIPC to USD 5.2 billion in 1999. Nearly all of this debt relief (98 percent) was oriented to LICs and fragile economies. Debt forgiveness reached its peak in 2006 amounting to USD 54.5 billion. The debt relief-to-GDP ratio spiked for LICs in 2006, reaching 30 percent. This spike is driven by Malawi, with debt relief representing 80 percent of its GDP. Countries like Rwanda, Niger, Uganda, Tanzania, Mauritania, Mali, Ethiopia, Mozambique, Benin and Burkina Faso received debt relief amounting between 22 and 39 percent of their respective GDPs.

Concessional financing from multilateral sources increased steadily as a share of total external debt until around 2004, and remained high in LICs and fragile countries. As expected, LICs and fragile countries have the highest share of concessional debt, though oil exporters now have concessional debt accounting for more than half their external debt, higher than the corresponding share in LMICs. Multilateral debt as a share of external debt increased steadily for LICs and fragile economies until the time when indebtedness starts decreasing, suggesting that multilateral debt began substituting for private debt in the aftermath of the 1980 debt crisis. The share of multilateral and concessional debt increases steadily until the early 2000s, when output starts growing, while PPG debt service as a share of GNI has been decreasing steadily.

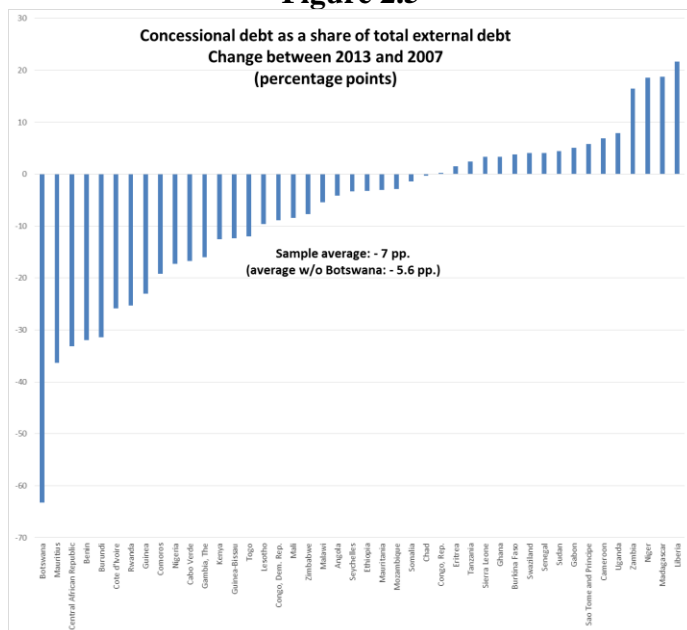
Increased concessionality has helped to reduce debt liquidity ratios by lowering debt service in fragile countries and LICs. The sub-prime crisis of 2008-09 led to a short-lived spike in interest payments and short-term debt in all groups except LICs. This is explained by the liquidity squeeze associated to the crisis. The spike in short-term debt was more noticeable in the case of fragile and lower-middle income countries – in the latter case the spike was more persistent. Since 2010, indebtedness and debt service indicators began increasing again, although reaching much lower levels than in previous decades, especially in the case of LMICs whose debt began increasing even earlier (2007). This concurs with the reduction of concessional debt, lower growth and higher primary deficits.

Similar to the case of total public debt, the patterns described above mask a significant heterogeneity across countries. For instance, while external debt has become less concessional since 2007 for the group as a whole (the share of concessional has decreased by 7 percentage points), for some countries the fall is in double digits, while for others there has been an increase of near 20 percentage points (Figure 2.5). Similarly, while the changing financial conditions after the global financial crisis have allowed SSA countries to marginally reduce their reliance on short term debt and their borrowing costs, the results differ greatly among countries (Figure 2.6).

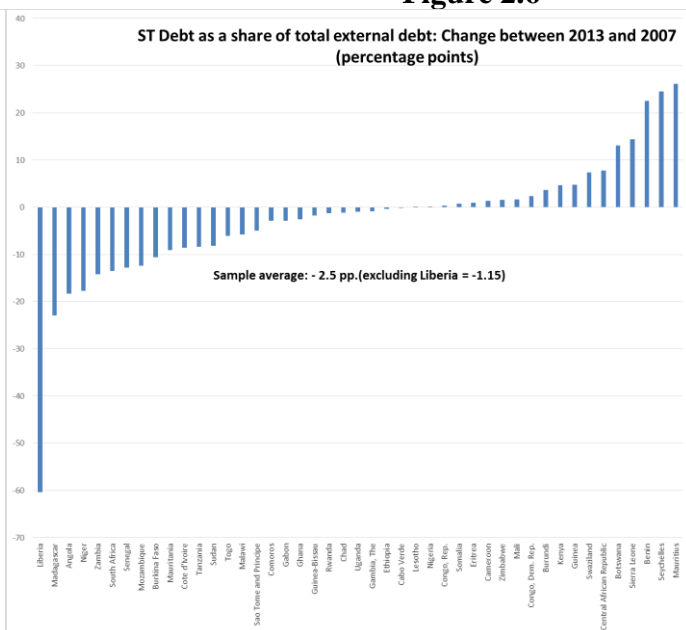
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<sup>4</sup> “External debt” refers to gross debt owed to nonresidents by residents of an economy. This can include obligations of the government and private sector.

**Figure 2.5**



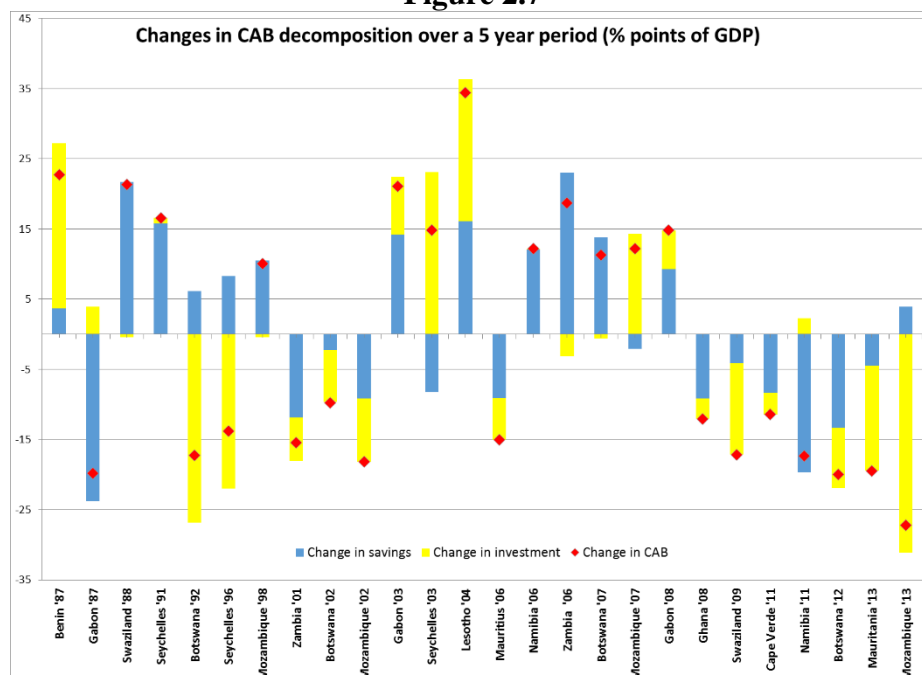
**Figure 2.6**



Source: WEO / IMF

Despite the record low interest rates and generally benign financing global conditions in recent years, the heterogeneity among SSA countries with respect to borrowing patterns and fiscal responses to the global financial crisis also shows, in some cases, in a significant worsening of the countries' current account balances (CABs). Figure 2.7 shows all SSA episodes in which the CAB changes by more than 10 percentage points of GDP within a five year period. Between 2003 and 2008 countries tended to improve their CABs (although in some cases this was achieved by an unsustainable reduction in investment). Since this time countries have tended to show a deterioration in their CABs, and only in two cases (Mauritania and Mozambique) was this because of a significant increase in investment. In Namibia, Cape Verde, Botswana the deterioration of the CAB was caused by a significant surge in consumption (or drop in savings).

**Figure 2.7**



Source: WEO / IMF.



### 2.3 Spotlighting countries with rapid debt accumulation

The long-term overview perspective of the past subsections presents a generally benign debt situation for SSA countries as a whole. However, this conclusion masks a high degree of heterogeneity among countries. Some countries may have exacerbated their debt-related vulnerabilities in recent years, although this may be understated when compared with the very high debt levels prevailing before countries received debt relief. This subsection spotlights countries with recent episodes (i.e., since debt relief) of a rapid change in debt stocks, as reported in the countries' DSAs. The sample for the analysis is the set of countries with a recent DSA, which is consistent with Sections 3 and 4 that look into debt dynamics and sustainability risks. Before proceeding it should be noted that the analysis here is not expected to deliver the same results as a full DSA, as reflected in Section 4, because while we look at debt accumulation since debt relief, the DSA looks at a larger set of (5) indicators projected over 20 years (see Box 1).

Debt accumulation is calculated for each country and used to flag rapid debt growth. For all 31 countries, the change in both PPG external debt and total public debt (as a share of GDP) is calculated between the minimum value observed after HIPC (i.e., after 2005) and the latest available data point (either 2013 or 2014)<sup>5</sup>. The change in indebtedness is used to classify countries in three debt-growth categories: low, moderate and high debt accumulation.<sup>6</sup> Combining this classification with the final debt-to-GDP ratio observed in either 2013 or 2014<sup>7</sup>, countries are subsequently classified in three "concern" categories: (a) low concern; (b) moderate concern; and (c) high concern. Results are shown in Table 2.2. It should be noted that Mauritania is classified as "High Concern" wholly on the basis of its high initial indebtedness (above 70 percent); the change in the country's debt was a modest 6 percentage points. Sudan also had high initial debt (above 50 percent) but also demonstrated rapid accumulation.<sup>8</sup>

There are important differences between the methodology reflected in Table 2.2 and debt sustainability risk assessments found in DSAs. Table 2.2 highlights countries that have shown rapid debt-to-GDP accumulation, which may not correspond to debt sustainability risk ratings. Most notably, DSAs may conclude there is heightened risk of debt distress based on debt ratios besides debt-to-GDP. For example, Burundi is high risk of debt distress in its most recent DSA due to a high debt-to-exports ratio (which we don't consider here), despite its debt-to-GDP ratio remaining relatively low. A similar situation occurs with Ghana. The following section uses the DSA database to further explore the debt dynamics of different country groups, including those assessed as "High Concern" in Table 2.2 below.

<sup>5</sup> Note that the criteria differs from Figures 2.3 and 2.4, where the initial and final data points are the same for all countries (2007 and 2013, respectively).

<sup>6</sup> For external PPG, low accumulation is a change in indebtedness of less than 10 percentage points (pp); moderate accumulation is a change in indebtedness between 10 and 15 pp; and high accumulation is a change in indebtedness greater than 15 pp. For total public debt low accumulation is a change in indebtedness less than 10 pp, while high accumulation is a change in indebtedness greater or equal to 10 pp. The selection of thresholds was sample-driven.

<sup>7</sup> We consider debt (both external PPG and total public) to be low if it is less than 30 percent of GDP, moderate if it is between 30 and 40 percent of GDP, high if it is above 40 percent of GDP, and very high if it is above 50 percent. The selection of thresholds was sample-driven.

<sup>8</sup> Despite some methodological differences, our results broadly correspond to those reported by Merotto et al (2015) – i.e., our low and high concern categories comprise almost the same countries that they report in their Groups 2 and 3.

**Table 2.2: Highlighting concern for recent debt accumulation**

	EXTERNAL DEBT		TOTAL PUBLIC DEBT	
LOW CONCERN	Benin Burkina Faso Burundi Cameroon CAR Comoros Congo, Republic of Côte d'Ivoire Ethiopia Guinea Guinea-Bissau	Liberia Madagascar Mali Rwanda Sierra Leone Tanzania Togo Uganda Zambia Chad	Burkina Faso CAR Comoros Congo, Republic of Liberia	
MODERATE CONCERN	DRC Ghana Niger Senegal		Benin Burundi Cameroon Côte d'Ivoire DRC Guinea Madagascar	Mali Niger Rwanda Sierra Leone Togo Uganda Zambia Chad
HIGH CONCERN	The Gambia Malawi Mauritania Mozambique Sao Tome & Principe Sudan		Ethiopia The Gambia Ghana Guinea-Bissau Malawi Mauritania	Mozambique Sao Tome & Principe Senegal Tanzania Sudan

In summary, while indebtedness has decreased in SSA countries as a whole, at least compared to the very high levels shown in the late 1990s, debt burden indicators for some countries appear to have deteriorated following the global financial crisis. The improvement shown when compared with the very high levels of indebtedness before debt relief masks an important degree of heterogeneity across countries. In fact some countries appear to have contracted significant levels of new debt after debt relief, a development that if left unchecked could reverse the benefits of debt relief. This development warrants a more detailed analysis of the underlying factors explaining the changes in debt and the potential risks and vulnerabilities associated. This is undertaken in the following two sections.

### Section 3. Underlying Debt Dynamics for Public and External Debt

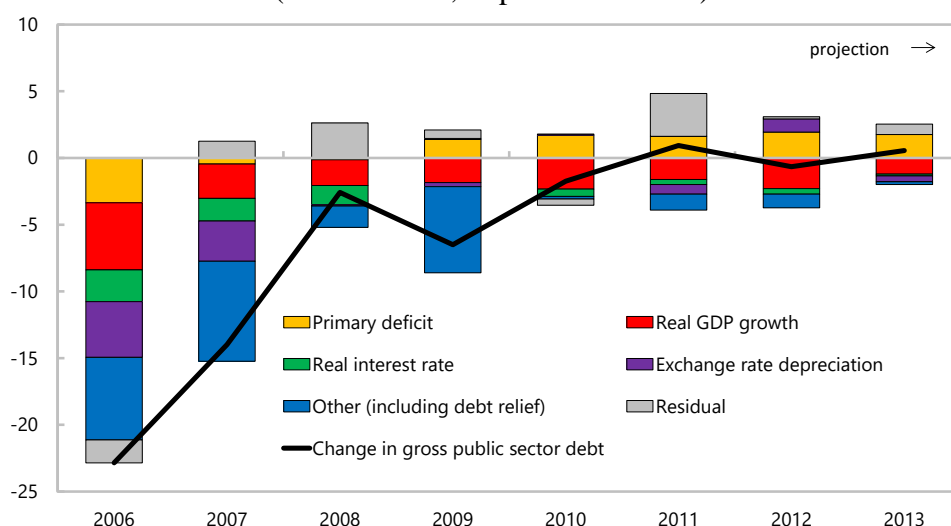
This section explores the following questions: what are the key drivers of debt buildup (or reduction)? And, have debt dynamics changed over time? The analysis looks at public sector debt and external debt dynamics since 2006, thus covering the global financial crisis years, highlighting significant differences between periods and across country groups. It measures the role played by exogenous and endogenous factors in explaining debt dynamics (i.e., primary deficit, changes in the real exchange rate, real GDP growth, real interest rate and “others” including debt relief). The analysis is based on 33 SSA countries, and the data for each country was obtained directly from the latest DSA undertaken jointly by World Bank and IMF staff.<sup>9</sup>

<sup>9</sup> There are 33 SSA countries covered by a DSA in either 2013 or 2014. For 27 of these countries, DSAs were carried out during the 2014 fiscal year, while six were covered during the 2013 fiscal year.

### 3.1 Public sector: Key drivers and changes in debt dynamics over time

The public debt measure considered in the DSA is in gross terms and comprises the stocks of public and publicly guaranteed (PPG) external and domestic debt. Figures 3.1 and 3.2 show the debt-creating flows in the sample of SSA countries covering the period 2006-2013. Debt dynamics and its main contributors are reported for all SSA countries aggregated by four non-overlapping groups: oil exporting countries, lower middle income countries (LMICs), low income countries (LICs), and fragile countries.

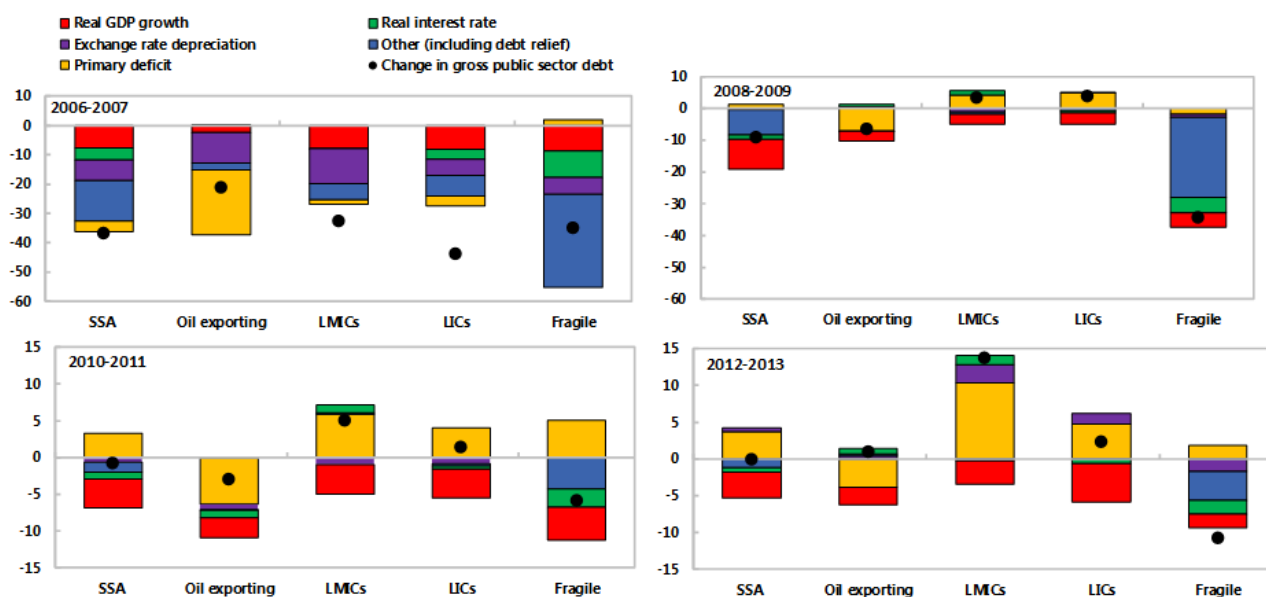
**Figure 3.1: Public Debt-Creating Flows**  
(All countries, in percent of GDP)



Strong rates of debt reduction in 2006-2007 were interrupted at the onset of the global financial crisis (Figure 3.1). Public debt-to-GDP ratios were around 90 percent in 2005 and fell to 54 percent in 2007. The level of public indebtedness stabilized at around 43 percent of GDP during 2010-2013. Throughout the entire period, GDP growth played an important and steady role in reducing debt ratios, although in magnitude this effect was larger in 2006-2007. Debt relief played a dominant role in lowering debt in 2006 and 2007, and again in 2009. The deterioration of the fiscal situation in the aftermath of the global financial crisis caused the primary balance to contribute to positive debt accumulation since 2009. The average real interest rate was a factor contributing to a fall in debt ratios during 2006-2008, showing the predominance of borrowing at concessional terms in LICs and fragile countries (see Figure 3.2).

Figure 3.1 shows that the 2006 debt reduction was mainly determined by debt relief, but it was also supported by strong economic growth, real exchange rate appreciation, and improved fiscal balances. Figure 3.2 indicates that the 2006-07 debt reduction was observed in all country groups, but driven by different factors. Debt relief was mainly oriented to non-resource rich fragile countries, while oil exporting countries benefited from a rise in primary revenues (around 9 percentage points during 2006) concurrent with higher commodity prices.

**Figure 3.2: Contribution to Changes in Public Debt since 2006**  
(Cumulative by sub-periods and country groups, in percent of GDP)

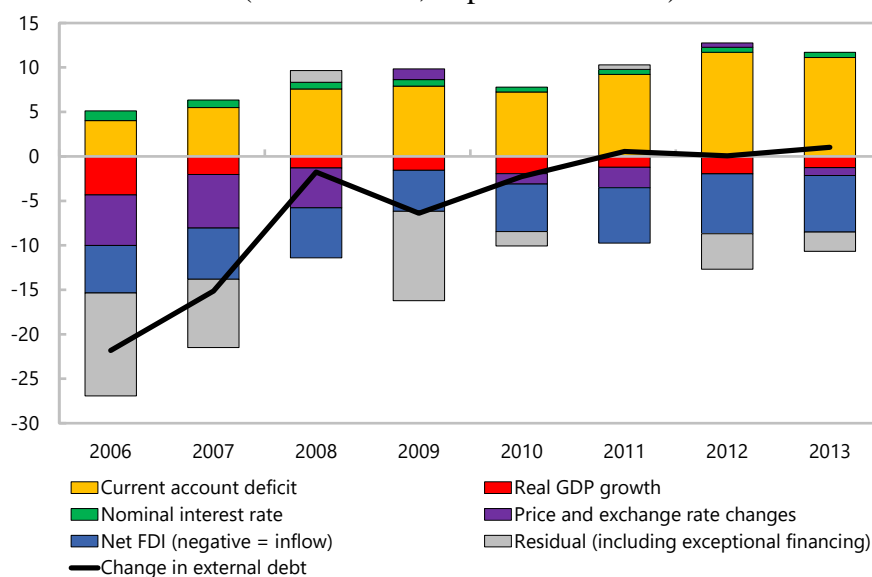


With the onset of the global financial crisis debt ratios stopped decreasing at the rates observed before – the average drop in debt in 2006-07 was about 18 percentage points of GDP, while in 2008-13 debt ratios decreased by merely 1.7 percentage points. Although public debt-to-GDP decreases on average for the full sample of SSA countries during 2008-09, dynamics are mixed for various sub-groups. The impact of the global financial crisis was more clearly observed in low and lower-middle-income countries – not classified as fragile or oil exporting countries – whose public debt ratios increased mainly driven by primary deficits. On the other hand, the impact of the crisis was mitigated for fragile non-oil exporting countries through debt relief, which contributed to reduce their debt by 24 percentage points of GDP during 2008-09 (-3.4 percentage points in 2008 and -20.3 percentage points in 2009). Oil exporting countries continued benefiting from positive fiscal balances. For the 2010-2013 period, public debt-to-GDP ratios remained stable, with the contribution from growth partially offsetting the primary deficit. The former contributed to a cumulative fall of 7.5 percentage points in the public debt-to-GDP ratio, while the latter contributed to an increase of 7 percentage points during the same period. However, this is not the case for LMICs that continue weakening their fiscal positions and borrowing at more costly terms. Primary deficits and average real interest rates have contributed to a cumulative increase in public debt ratios by 16 and 2 percentage points, respectively, during 2010-2013.

### 3.2 External sector: Key drivers and changes in debt dynamics over time

Total external debt comprises PPG external debt, private non-guaranteed (PNG) external debt, and short term external debt. Figures 3.3 and 3.4 show the external debt-creating flows in SSA covering the period 2006-2013 for the region as a whole and for the non-overlapping groups. Figure 3.3 shows that external debt decreased significantly during 2006-2007 (by 37 percentage points). In 2005 total external debt amounted to 83 percent of GDP, but that figure fell to 46 percent in 2007. The size of the debt reduction decreased during the global financial crisis, and since 2010 total external debt has stabilized at around 37 percent of GDP, which is still low by historical standards.

**Figure 3.3: External Debt-Creating Flows**  
(All countries, in percent of GDP)



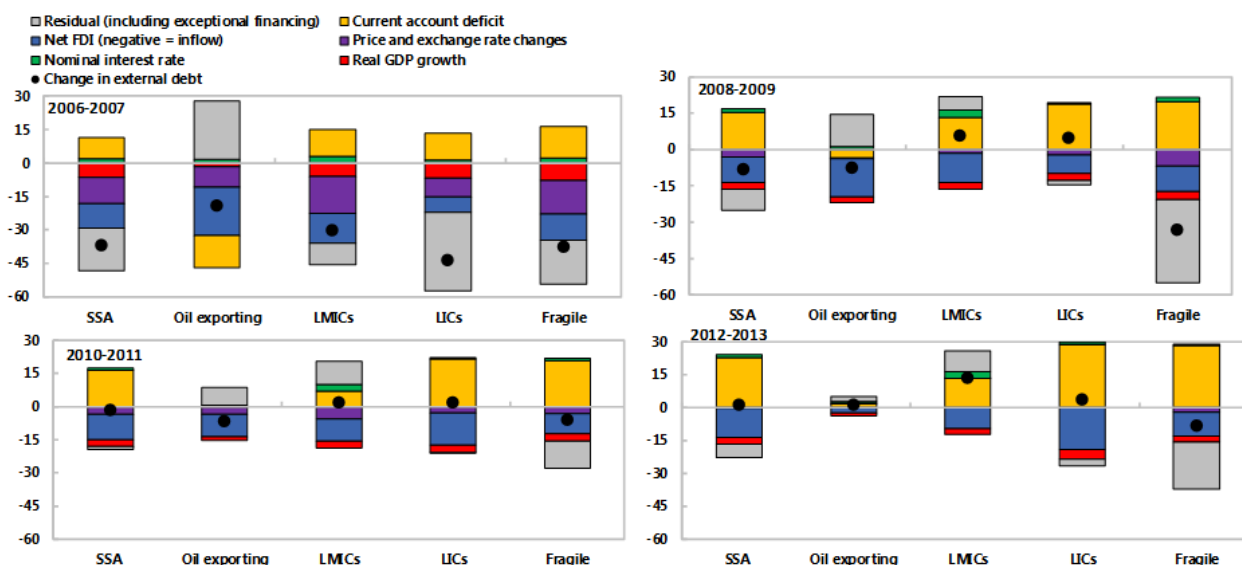
Current account deficits driven by higher imports and lower official transfers have persistently caused higher external indebtedness, though the impact has been moderated by net foreign direct investment (FDI) inflows. Since the global financial crisis current account deficits widened from an average of 4.8 percent of GDP in 2006-07, to 7.7 percent of GDP during 2008-09, and further to 11 percent of GDP by 2013<sup>10</sup>. On the other hand, FDI inflows were fairly stable during 2006-13, contributing to a decrease in external debt of about 5-6 percentage points each year. The exception was 2012, when the contribution of FDI inflows increased to 7 percentage points. In terms of the endogenous debt dynamics, GDP growth alleviated the external debt burden by 4.3 percentage points in 2006, but its contribution decreased in 2007, staying stable at about 1.6 percentage points on average each year since. The residual that includes exceptional financing<sup>11</sup>, that is, changes in arrears and debt relief, shows again the importance of debt relief under the HIPC and the MDR Initiatives in 2006 and 2007, and again in 2009.

<sup>10</sup> The size of the CAD contribution does not differ significantly if measured by the medians instead of the means, as shown in the following table (numbers in table represent percentage points of GDP):

	2006	2007	2008	2009	2010	2011	2012	2013
Mean	4.0	5.5	7.6	7.9	7.2	9.2	11.7	11.1
Median	4.6	6.3	9.0	7.0	8.5	7.4	8.1	10.0

<sup>11</sup> The residual also includes changes in gross foreign assets and valuation adjustments.

**Figure 3.4: Contribution to Changes in External Debt Since 2006**  
(Cumulative by sub-periods and country groups, in percent of GDP)



External indebtedness decreased for the SSA group until 2009, and remained stable thereafter, but the SSA average result masks significant differences across country groups, especially in later years. External debt-to-GDP fell for all country groups in 2006-07, although the underlying factors are different across groups. In the case of oil exporting countries the fall is mainly explained by current account surpluses and FDI inflows, reflecting boom years for commodity prices. For other groups, dynamics were driven by the appreciation of the local currency, net FDI inflows (particularly in LMICs and fragile economies), debt relief (particularly in LICs and fragile economies), and to a lesser extent by economic growth.

Although external public debt-to-GDP decreased on average for the full sample of SSA countries in 2008-2009, results differ across sub-groups. LMICs and LICs – not classified as fragile or oil exporting countries – were more exposed to the effects of the global financial crisis and did benefit neither from current account surpluses (as oil exporting countries) nor debt relief (as fragile economies did). Therefore, LMICs and LICs reported growing external debt-to GDP ratios driven by current account deficits and more expensive borrowing terms in the case of LMICs.

Similarly, although external debt remained stable as a share of GDP for the SSA region as a whole in 2010-11 and 2012-13, there has been a significant debt accumulation for lower middle income countries (15 percentage points for the whole period) which was not fully mitigated by other factors. On the other hand, fragile economies and LICs report a dramatic widening in their current account deficits, but this is mitigated by net FDI inflows and by exceptional financing (debt reductions) in the case of fragile countries (14.5 percentage points for the whole period).

Debt dynamics behind the countries with the sharpest debt accelerations are also exceptional, largely driven by macroeconomic weaknesses. There are four “High Concern” countries from Table 2.2 that showed external PPG debt growing by more than 15 percentage points between 2007-08 and 2013-14<sup>12</sup> and total final external debt-to-GDP greater than 40 percent – The Gambia, Malawi, Mozambique and Sao Tome & Principe. Very large and consistent current account deficits drove the debt accelerations in Mozambique and Sao Tome & Principe, with imbalances averaging more than 22 percent of GDP per annum for both countries between 2008 and 2013. Net FDI flows only partially offset these large imbalances, including inflows to finance Mozambique’s “megaprojects” in the extractive sectors. In Malawi, external PPG debt grew from 16 to 41

<sup>12</sup> The minimum (and latest) debt-to-GDP value occurs in either 2007 or 2008 (2013 or 2014).



percent of GDP between 2008 and 2013. The largest jump came in 2012, when poor crops drove a large export contraction and the Kwacha depreciated heavily, which drove external PPG up by more than 20 percentage points. The Gambia also ran larger than average current account deficits (14 percent of GDP on average between 2008 and 2013). The effect on external PPG debt was further exacerbated by depreciations in 2009 and 2013.

### 3.3 Projected debt dynamics for public and external debt

Aggregating results across recent DSAs shows that public debt as a share of GDP for the SSA region as a whole is projected to decrease at increasing rates starting in 2015, from a level of around 45 percent of GDP in 2014. This dynamic is projected to be driven by sustained improvements in the fiscal balances and sustained GDP growth. The contribution of both real GDP growth (negative) and the average real interest rate (positive) are projected to remain stable through the projection period, but the contribution of the latter is minor. At roughly -0.3 percentage points of GDP per year, on average, the contribution of the exchange rate appreciation over the medium term through 2019 is negligible.

Public debt is expected to remain stable for oil exporting countries at around 22-23 percent of GDP, while it is projected to decrease for all the other groups. For LMICs, debt ratios are projected to drop significantly from 70 percent in 2014, to 62 percent in 2019, reaching 46 percent in 2033. The main drivers of this debt reduction are continuous improvements in primary balances – reaching surpluses during 2018-2020, and stabilizing at small primary deficits afterwards – and sustained GDP growth. For oil exporting countries primary surpluses and growth contribute to a debt reduction that is offset by an accumulation of assets, thus external debt-to-GDP remains stable.

For LICs, public debt-to-GDP ratios are projected to drop slowly by 0.4 percentage points on average each year, from 46 percent in 2014 to 44 percent in 2019, reaching 40 percent in 2033. Strong and stable GDP growth is expected to offset persistent, albeit slightly decreasing, primary deficits. For fragile economies, GDP growth is projected to more than offset reduced primary deficits, contributing to a reduction in public debt ratios of 7 percentage points during 2015-2019 (from 42 percent to 35 percent). Public debt is expected to reach 20 percent by 2033.

The average external debt-to-GDP ratio projected for the SSA region is estimated to remain stable in the medium term, near 40 percent of GDP. This dynamic is explained by projected sustained net FDI inflows and low economic growth, which together only partially offset persistent current account deficits. The ratio of external debt-to-GDP is expected to decrease in LMICs, to stabilize in oil exporting countries and fragile economies, and to slightly increase in LICs. In the case of LMICs this is mainly explained by decreasing current account deficits that are offset by FDI inflows, sustained GDP growth and some appreciation of currencies, while more expensive borrowing terms continue to push debt ratios up. LICs project large current account deficits that slightly increase over time, impeding any debt reduction. Fragile economies, on the other hand, are expected to have a decreasing path in both current account deficits and net FDI inflows, thus keeping external debt stable.

Projected real exchange rate movements will contribute to reduce external indebtedness in the baseline scenario for the SSA region as a whole. In fact, the contribution from price and exchange rate changes is expected to generate an average cumulative reduction in external debt ratios of roughly 5.5 percentage points through 2019. Only a few countries are the exception: Republic of Congo, Ghana, Mauritania and Sudan, for which the contribution from price and exchange rate variations is expected to push debt ratios up in the medium term – the cumulative effect amounts up to 2.6, 7.9, 3.3 and 6.7 percentage points respectively. For

the period 2020-2033 all the countries, with the exception of Mauritania, are projected to have a negative contribution from price and exchange rate. Mauritania has a projected small cumulative effect of 11 percentage points (0.8 percent per year on average).

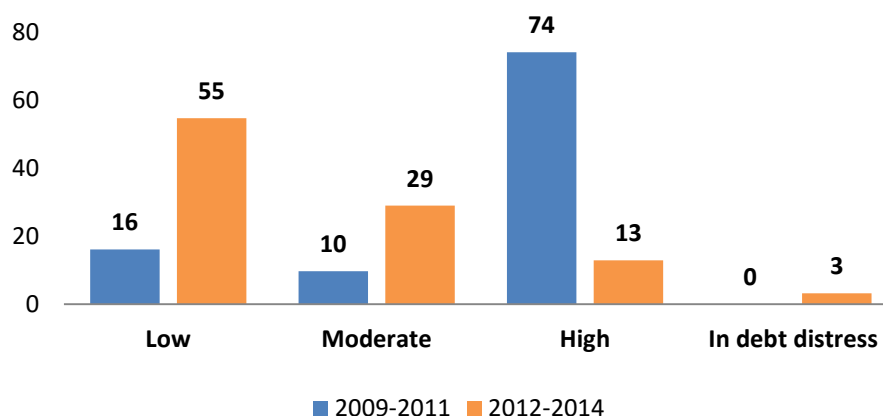
## Section 4. Evolution of Debt Risks in SSA Countries

This section reviews the risk assessments based on joint World Bank / IMF DSAs, and then turns to highlight particular vulnerabilities that are important for SSA policy-makers. First, we analyze how country risk ratings, as assessed by WB and IMF country teams, have changed in recent years. We extend the analysis by looking at how vulnerabilities are exacerbated across country groups under specific stress tests imbedded in the DSA. Next, we deepen the analysis of the countries' debt vulnerabilities by undertaking tailored simulations and detailed analyses of the role played by critical variables in the DSA. The tailored simulations comprise the recent oil price shock, which is not included in DSAs undertaken before 2015, and the sluggish recovery in Europe and slower growth in China. The critical variables analyzed comprise non-debt creating flows, contingent liabilities and the international bond issuance by some countries.

### 4.1 DSA-based risk assessments in SSA countries

Consistent with the overall picture presented in previous sections, the risks of debt distress of SSA countries, as assessed by the joint WB-IMF DSAs, have decreased substantially in recent years. When comparing across periods, debt vulnerabilities reflected in DSAs have improved in recent years for SSA countries as a group – the conclusion is drawn after comparing DSAs undertaken in 2009-11 with those undertaken in 2012-14, for the group of 31 countries that have DSAs in both periods (Figure 4.1). Between the two periods, 20 of 31 countries improved their ratings, while 9 remained unchanged (of these 4 are 'high', 2 'moderate' and 3 'low') and only two deteriorated – Mozambique and Sudan. Further, of the 20 countries that show an improvement in their risk ratings more than half (65 percent) improved by more than one step (went from 'high' to 'low'), while 7 improved one step (6 from moved from 'high' to 'moderate' and 1 from 'moderate' to 'low'). The rating deterioration from 'low' to 'moderate' for Mozambique is due to increased external borrowing for infrastructure investments around natural gas exploration and liquefaction. However, as noted in the DSA these investments are broadly seen as important for the country's development, and the increased risk of debt distress is deemed appropriate.

**Figure 4.1: DSA Based Debt Distress Level Change**  
(Percentage of total sample)



## 4.2 Sensitivity of debt vulnerability to different shocks in SSA countries

This section analyses the sensitivity of SSA countries' debt vulnerabilities to shocks affecting key macro variables. To this purpose we summarize how the different debt burden indicators deteriorate, for the whole sample and for specific country groups, under different scenarios imbedded in the DSA. The scenarios we study are detailed in Table 4.1 below and the results are presented in tables 7A through 7C in the Annex.

**Table 4.1: Alternative scenarios used for sensitivity analysis**

Public DSA		External DSA	
Shock/Variable affected	Explanation	Shock/Variable affected	Explanation
A2: Primary Balance	Primary balance is set to its last year of history for the entire projection horizon.	A2: External financing conditions	New public sector loans on less favorable terms (200 basis points higher) during entire projection horizon
A3: Real GDP growth	Real GDP growth is lowered by a fraction of its standard deviation for the entire projection period <sup>1/</sup>	B1: Real GDP growth	Real GDP growth is lowered in years t+2 and t+3 <sup>2/</sup>
B1: Real GDP growth	Real GDP growth is lowered in years t+2 and t+3 <sup>2/</sup>	B2: Exports growth	Export value growth lower in t+2 and t+3 <sup>2/</sup>
B4: Exchange rate depreciation	One-time 30 percent real depreciation in t+2	B6: Exchange rate depreciation	One-time 30 percent real depreciation in t+2

<sup>1/</sup> For additional details see Painchaud and Stučka (2011).

<sup>2/</sup> Growth is set at its historical average minus one standard deviation.

Overall, we observe that average liquidity indicators are only marginally affected by shocks for the sample as a whole and for the different groups, despite the fact that small deviations from the baseline tend to be protracted, especially in the case of debt service to revenue. <sup>13</sup> As a result risk ratings on average are not sensitive to liquidity shocks. Further, in the situation pre-shock breaches are on average short lived and small in size (Annex Table 7C), leading to few cases of high risk of debt distress.

On the contrary, solvency indicators show sensitivity to shocks, leading to more protracted and larger breaches on average. In the public DSA shocks lead to protracted deviations from the baseline in general, although the size of the changes in debt-to-GDP ratios varies across groups. The depreciation shock has a lesser effect in general, on average, while shocks to the primary balance (A2) and real GDP growth (B1) affect the Frontier and HIPC groups more. Real GDP shocks are the main source of vulnerability of Fragile and Oil Exporting countries (Annex Table 7A).

Similar effects are found for solvency indicators in the external DSA, although the effect on breaches vis-à-vis the threshold is more significant on the duration rather than the size of the breach (Annex Table 7B).

<sup>13</sup> Deviation from the baseline are not reported in tables 7A through 7C, but available upon request from the authors.

HIPCs and Fragile countries are the groups most affected by shocks, both in the size and length of breaches, while Oil Exporters are less affected, except for the shock on exports growth (B2).

Overall, LICs on average are more vulnerable to suffer a downgrade in their risk ratings because of shocks affecting their solvency rather than liquidity, a result consistent with their historical – albeit decreasing – access to concessional financing.

### **4.3 Assessing Debt Vulnerabilities of SSA Oil Exporting Countries after the 2014 Oil Price Shock**

This section sheds some light on the SSA oil exporting countries' debt vulnerabilities resulting from the oil price shock of late 2014, which directly affects their debt repayment capacity. The exercise illustrates how the different debt burden indicators – and the risk of debt distress – would change in each of the four oil exporting countries after the shock, if they were to substitute the lower exports and government revenues with new government (PPG MLT) debt, so that no adjustment is forced on the economy – no reduction in imports, government expenditures or changes in the exchange rate occurs. The magnitude of the changes in the debt burden indicators under such, albeit extreme, assumptions illustrates how exposed oil exporting countries are to oil price shocks or, alternatively, to what extent an adjustment to the above variables is warranted if a risk classification downgrade is to be avoided.

In order to evaluate how significantly the oil price shock can affect the countries' debt situation, we make new projections for the five debt burden indicators using the latest available DSAs and a new oil price series that incorporates the drop of late 2014 and an assumed slow recovery thereafter. We begin by comparing the oil price projections made by the US Department of Energy in April of 2014, with those made by the World Bank Prospects Group in January of 2015. The comparison shows a drop of 45 percent in the oil price in 2015 (year average) and a recovery thereafter of 7 percent yearly until 2023. We use the projected drop in 2015 and the eight years recovery to recalculate the value in USD of each country's exports, given the shares of oil in total exports (see Table 4.2 below). Starting in 2024 the price of oil and the value of total exports in USD are assumed to be the same as in the baseline of each country's DSA. In addition, the change in the value of total exports during 2015-23 is subtracted from the baseline CAB and GDP series. In other words, using the new series for oil prices we compute new series for exports, CAB and GDP, which are then hardcoded into the DSA.

Similarly, given the share of each country's oil revenues in total revenues (see Table 4.2 below), we compute a new series for total government revenues – to do this we apply the same 45 percent drop in 2015 and 7 percent yearly increase thereafter until 2023 to the oil revenues.

Next, two different scenarios are constructed. In the first we assume that the government contracts additional debt to finance its larger deficit, so that government expenditures remain the same as in the baseline. In this case the private sector is implicitly assumed to incur additional debt (or reduce imports) to finance its share of the larger current account deficit. In the second – more restrictive – scenario the government is assumed to contract new debt to entirely finance the larger current account deficit (i.e., new government debt finances the shortage of FX caused by the lower oil price). In both cases the new debt contracted by the government is assumed to be half from multilateral and half from commercial sources.

**Table 4.2: Share of oil in exports and revenues, selected countries, 2010-13**

<u>Country</u> <sup>*/</sup>	<u>Share of oil exports in total</u>	<u>Share of oil revenues in total</u>
Cameroon	0.53	0.25
Chad	0.86	0.66
Congo, Rep. of	0.73	0.75
Nigeria	0.82	0.68

<sup>\*/</sup> We do not consider other SSA oil-exporting countries, such as Gabon or Angola, because they are upper middle income and no DSA has been recently produced.

Source: World Integrated Trade Solution (WITS) and country DSAs.

Overall, as expected, the results show a protracted deterioration in all debt burden indicators vis-à-vis the original baseline in both scenarios, with Cameroon being the country showing the smallest differences with the baseline and Nigeria the largest (see Annex Tables 4A and 4B). Also as expected, among the solvency indicators the PV of debt-to-exports and the PV of debt-to-revenues ratios show the largest differences with the baseline. However, the liquidity indicators – debt service to revenue and to exports ratios – show large differences with the baseline only in the case of Nigeria. The PV of debt-to-GDP ratio also shows a large difference vis-à-vis the baseline in the case of Republic of Congo.

Deterioration in the risk of debt distress classification could be warranted in the case of Nigeria, a low risk of debt distress country according to the latest DSA, where the new scenarios lead to several large breaches of the thresholds – albeit not always protracted. Although the same happens with Chad, a downgrade could not be possible as the country – according to the latest DSA – is already classified as high risk of debt distress. In the case of Republic of Congo a downgrade is possible but would require a deeper analysis, while Cameroon should remain as low risk.

In summary, with the exception of Cameroon which has the lowest shares of oil in total exports and revenues, SSA oil exporters are significantly affected by the drop in oil prices as their debt burden indicators deteriorate significantly.

#### **4.4 A sluggish recovery in Europe and lower growth in China**

Similar to the results above, in this subsection we present the results of a simulation exercise that models the effects on SSA exports of the slowdown in China's growth and the sluggish recovery in Europe. For this purpose we first measure each country's share of exports to China, Europe and the SSA region<sup>14</sup>. Taking a minimum cut-off of 15 percent, we divide the SSA countries into three groups according to which market receives the largest share of their exports (if none of the three markets reach the minimum of 15 percent, the country is excluded from the exercise). The classification, shown in Annex Table 5, leads to a sub-sample of 24 countries among our 33 DSA sample. The main export market is the Euro Zone, the SSA region and China for half, one third and one sixth of the sub-sample, respectively.

The shock consists of applying a lower growth rate on exports destined to the main export market starting in 2015. The new growth rates are 1.01 percent for exports to the Euro Zone, 6.5 percent for exports to China and 1.11 percent for exports to the SSA region. These rates were chosen to reflect the lowest growth of imports observed in Europe and China in the post-crisis years, while for SSA it is the average of the same rates weighted by the share of exports from SSA to Europe and China (0.193 and 0.141, respectively). The exercise then assumes that the increasing external financing gap in the current account is covered from

<sup>14</sup> Using IMF and WDI data we calculate the average share over 2005-2013, although periods may differ among countries if country data is not available in all years.

external commercial and multilateral (IMF) sources in the same proportion – 50 percent each. The financing terms are the same assumed in each country’s latest DSA.

For 3 of the 24 countries – Republic of Congo, Mauritania and Sudan – the exercise results in an improvement of their external debt burden indicators. This occurs because we apply the same new growth rates to the exports projected for 2015 and onwards to all countries, thus ignoring other developments considered in the DSA that affect the country’s exports during the projection period, such as a depletion of natural resources<sup>15</sup>. For this reason in the discussion below we refer only to the remaining 21 countries. The results are shown in Annex Table 6, which presents summary measures for the deviations vis-à-vis the corresponding thresholds of the relevant debt burden indicators, both in the baseline and new scenario. The table also shows summary statistics for the deterioration of the debt burden indicators vis-à-vis the baseline after the exports growth shock. All measures, unless indicated, are in percentage points.

In the majority of cases (13 out of 21)<sup>16</sup>, the shock appears to be mild. The two debt burden indicators are negatively affected, however not to an extent large enough to cause a breach of the thresholds in the projection horizon. For these countries the slowdown in exports growth does not appear to be a major cause of concern in regard to their debt sustainability.

For 4 countries – Comoros, Guinea-Bissau, Sao Tome & Principe and Zimbabwe – the effect of the export shock, whether large or small, does not change their overall risk assessment because the debt burden indicators already showed breaches in the baseline scenario. In all these cases except Guinea-Bissau the effect of the shock appears to be large, leading to larger and more protracted breaches. In the case of Guinea-Bissau the shock mildly affects the debt-to-exports ratio and the effect on the debt service-to-exports ratio is negligible.

Finally, for 4 countries – Cameroon, Cote d’Ivoire, Ethiopia and Mozambique – the export shock could lead to a worsening of their risk of debt distress as the outcome are more or less protracted breaches of the thresholds, whereas there are no such breaches in the baseline. The effect is more notorious in the cases of Cameroon and Mozambique, while it is milder in the cases of Cote d’Ivoire and Ethiopia.

Overall, the effect of a slowdown in exports, caused by the slowdown in China’s growth and the sluggish recovery in Europe, seem to affect quite differently the SSA countries. For the majority of them there is no significant effect at all, while for a few there is a deterioration of an already risky situation. For a small group the effect could mean a downgrading of their risk of debt distress assessment.

#### **4.5 Dependence on non-debt creating external flows for financing current account imbalances, including net FDI and remittances.**

Net FDI, as recognized in Section 3, is a key driver of debt dynamics both historically and in future baseline projections of debt ratios. These inflows for SSA countries grew nearly six-fold in the past decade and have financed important development-related investments in the region (Figure 4.2).<sup>17</sup> However, these inflows are heavily concentrated. Four countries accounted for more than half of the FDI inflows in 2013 (South Africa, Mozambique, Nigeria and Ghana). Inflows are also concentrated in extractive industries. Energy (including oil, gas and mining) remains the largest sector for Greenfield FDI, with countries such as DRC, Nigeria, and

<sup>15</sup> Unless we analyze each DSA in greater detail, there is no easy way to separate country-specific supply shocks from the demand shock we are modeling in constructing the new scenario.

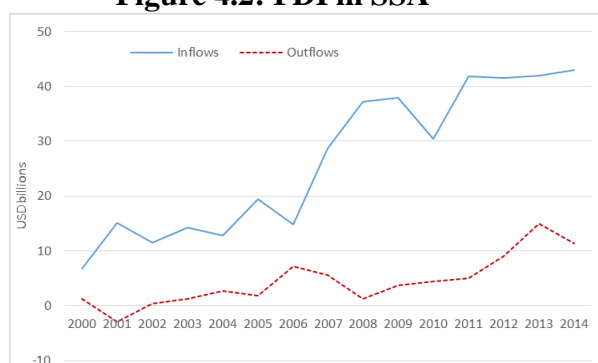
<sup>16</sup> Cape Verde, Democratic Republic of Congo, Ghana, Guinea, Kenya, Malawi, Nigeria, Rwanda, Senegal, Sierra Leone, Togo, Uganda and Zambia.

<sup>17</sup> Source: UNCTAD. “World Investment Report 2014”. UNCTAD, Geneva. June 2014.



Zambia rendering high rates of return on FDI. This relative concentration underscores the relatively small number of countries that can rely on large FDI inflows to finance current account imbalances. The downside risk of these projections is further revealed by the sharp drop in commodity prices starting in 2014.

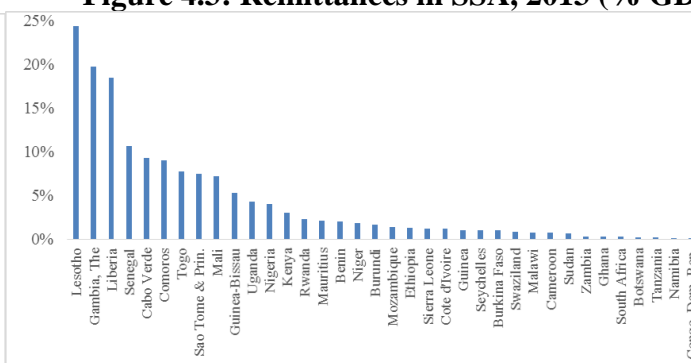
**Figure 4.2: FDI in SSA**



Source: UNCTAD Invest Report 2015

(<http://unctadstat.unctad.org>) WLD = World.

**Figure 4.3: Remittances in SSA, 2013 (% GDP)**



Source: World Bank Migration and Remittance Team.

Migrant remittances have become an important source of external finance for SSA countries, and are increasingly used to bolster repayment capacity in debt analyses (Figure 4.3). Remittances sent by international SSA migrants nearly quintupled between 2000 and 2010. Total inflows reached nearly USD 22 billion in 2010, equivalent to 2.2 percent of SSA's gross domestic product and up from only USD 4.6 billion in 2000.<sup>18</sup> Average annual growth of remittances since 2010 has topped 10 percent for 15 SSA countries, with Liberia (87 percent), Sao Tome and Principe (39 percent) and Botswana (27 percent) showing the fastest growth in inflows. Sources often include a majority from Europe, including strong relations with previous colonial powers such as Senegalese migrants in France or Kenyan migrants in the United Kingdom. There are significant flows from within region sources as well, for example from Togolese workers in Nigeria. While these flows have historically been more stable than overall capital flows, including foreign direct investment, there can be disruptions or volatilities that present downside risks. To the extent these inflows are assumed to bring in foreign exchange that, inter alia, will be used to cover debt repayments, this represents a vulnerability to liquidity to service external obligations that governments should assess and anticipate.

The joint WB/IMF LIC DSA methodology (see Box 1) has recently been revised to account for the importance of remittances<sup>19 20</sup>. Given the similarity of remittances to other variables used to measure repayment capacity, the methodology incorporates remittances by adding them to the denominator of three debt burden indicators of the external DSA: debt-to-GDP, debt-to-exports and debt service-to-exports. At the same time, the thresholds for these indicators when remittances are incorporated have been reduced. Taken together, these adjustments to the indicators and thresholds can deliver a more accurate reflection of countries' solvency and liquidity risk in light of remittances. Remittances must be included in the DSA baseline if they are large (i.e., greater than 10 percent of GDP and greater than 20 percent of exports).

A review of recent DSAs shows that roughly one-third of SSA countries calculate remittance-adjusted ratios in their DSAs. The level of dependence varies across countries, but in the highest cases these inflows can dwarf foreign direct investment inflows, such as in Senegal where remittances are more than seven times the size of FDI inflows. Reliance is also typically high in island states such as Comoros and Cabo Verde. While

<sup>18</sup> The source for remittance flows is the World Bank's Migration and Remittances Team ([Migrationandremittances@worldbank.org](mailto:Migrationandremittances@worldbank.org)). The true size of remittance flows to Africa, including unrecorded flows through formal and informal channels, is believed to be significantly larger than the official data.

<sup>19</sup> Source: World Bank/IMF "Revisiting the Debt Sustainability Framework for Low-Income Countries". (2012)

<sup>20</sup> The DSF uses the concept of gross workers' remittances. Workers' remittances are defined in the fifth edition of the Balance of Payments Manual (BPM5) as current transfers by migrant workers employed in new economies and considered residents there. In the sixth edition of the manual (BPM6), workers' remittances are referred to as "personal transfers."

remittance inflows are relatively robust, significant declines can lead to additional external borrowing and can raise the risk of external debt distress. For example, in Senegal the incorporation of remittances is a key reason why the country has a low risk of debt distress, and a negative shock to these inflows raises the risk rating to moderate. Similarly, reducing the projections by one quarter causes debt ratios in the baseline to climb above the policy-dependent thresholds in Comoros, delivering a high debt distress rating.

Relevant countries should monitor these inflows closely and provision for shortfalls when planning external debt servicing, including island states and those with liquidity challenges for euro-bond repayments. While the majority of SSA countries do not rely on incorporating remittances when considering debt sustainability risks, there are a number of countries that are exposed to significant risk. This is especially important for countries with chronic and large current account deficits, including island states with limited options for foreign exchange earnings. The latter is well known outside the region, but relevant for countries such as Comoros. More broadly for countries in the region, attention to reliance on remittances is important for countries with high refinancing risks from euro-bond issuances with bullet repayments.

#### **4.6 Accounting for contingent liabilities in debt sustainability analysis (key liabilities and magnitudes).**

Disclosing fiscal risks from exogenous shocks and the realization of explicit or implicit contingent obligations of the government is a significant issue for debt sustainability. These fiscal risks can come from state-owned enterprises (to the extent that such enterprises are not included in the definition of the public sector), sub-national governments, public-private partnerships (PPPs), and weaknesses in the financial sector. PPPs may be a particular issue, given the large number that have recently been introduced in Africa. While the baseline scenario in a DSA may have a complacent view on public debt, large contingent liabilities could pose substantial risks not captured in the stress tests.

Valuation of these risks can involve complex estimation of contingency events and explicitly controlling for contingent liabilities in DSAs is a challenge. Recent DSAs were reviewed for examples of countries that have recognized contingent liabilities in their risk assessments. There are two DSAs in particular that provide good examples of incorporating explicit recognition of significant contingent liabilities. The first was in regards to a private-public partnership in the roads sector in Uganda, and the second was valuing the amount of known contingent liabilities arising from pension obligations and government guarantees in Tanzania.

- The 2014 DSA for Uganda incorporates contingent liabilities arising from two public-private partnership (PPP) projects. Expected contingent liabilities associated with two road projects to be developed under PPP arrangements, amounting to about 1½ percent of GDP, are included in the baseline projections. The Ugandan authorities are considering further use of PPPs to ease pressure on government financing, and are strengthening the relevant regulatory framework to be able to better assess potential contingent liabilities.
- The 2014 DSA for Tanzania includes a 5.5 percent of GDP contingent liability in the first year of projections. While the baseline outlook for public debt remains favorable, continued fiscal consolidation is a critical assumption to maintaining the country's low risk of debt distress. In addition, recognizing the additional outstanding pension and other liabilities can have an impact on the level of public debt. The most extreme shock to the external DSA solvency indicators – public debt-to-GDP and public debt-to-exports – corresponds to a 10 percent of GDP increase in debt-creating flows in 2015, which would capture some of the government implicit contingent liabilities and/or non-central government borrowing that is not included in the DSA.

Given the large potential impact that contingent liabilities can have on DSAs, authorities in SSA countries are encouraged to properly account for these risks where significant. Part of the challenge faced by analysts is the difficulty in quantifying the valuation of fiscal risks from exogenous shocks and the realization of explicit or implicit contingent liabilities of the government. It is often not easy to determine the likelihood of a sufficiently large shock that will trigger contingencies for government obligations. However, in cases where significant contingent liabilities are anticipated, incorporating a crude estimate is more useful than omission. Future capacity building efforts may also help further the identification and disclosure of fiscal risks in the DSA.

#### 4.7 International sovereign bond issuance by developing SSA countries<sup>21</sup>

Sub-Saharan African countries have increasingly tapped international investors as an additional source of sovereign financing since the global financial crisis, most notably in the last two years. The issuance of international sovereign bonds by SSA governments has increased rapidly, rising from a 2009 issuance by Senegal for USD 200 million, to over USD 6.2 billion issued in 2014 by six SSA sovereigns (Table 4.3). This increase in access to financial markets offers tremendous potential benefits to SSA countries, such as supplementing low domestic savings, further diversifying the investor base, extending the maturity profile of debt profiles, and helping address declining access to concessional financing.

**Table 4.3: SSA Issuance of International Sovereign Bonds (USD millions)**

Country	2009	2010	2011	2012	2013	2014	Total
Angola				1000			1000
Cote d'Ivoire		2330				750	3080
Ethiopia						1000	1000
Gabon					1500		1500
Ghana					750	1000	1750
Kenya						2000	2000
Mozambique					850		850
Namibia			500				500
Nigeria			500		1000		1500
Rwanda					400		400
Senegal	200		500			500	1200
Seychelles		168					168
Tanzania					600		600
Zambia				750		1000	1750
Total	200	2498	1500	1750	5100	6250	17298

Source: Tyson (2015).

However, international bond issuance also brings significant risks. These risks vary by country context and the purpose of the borrowing, with increased foreign exchange risk the most notable. Given the typical large size of international issuance (most frequently greater than USD 500 million), the foreign exchange exposure of the country's debt portfolio can increase significantly, leaving the country at risk of future depreciation inflating servicing costs. This risk can be significant for the region, as evidenced by the large depreciations of the Ghanaian and Nigerian currencies in 2014. The recent slowdown in commodity

<sup>21</sup> International sovereign bonds are defined as government bonds issued in foreign currency in international jurisdictions. South Africa has issued many such bonds but is outside the scope of the paper, and thus excluded from the section.

demand from China and the volatility of global commodity prices are reminders of the risks that external shocks present to commodity-based economies in meeting external debt obligations. However, international issuance does not necessarily raise foreign exchange risk. For example, Cote D'Ivoire's 2010 issuance – by far the largest among the sample – did not exacerbate the foreign exchange exposure for the country. The issuance was part of the country's debt restructuring under the HIPC framework, and resolved commitments to external commercial creditors holding defaulted Brady bonds.

An additional key risk faced by SSA international bond issuers is meeting very large bullet repayments.<sup>22</sup> These bullet-type repayment structures account for just over two-thirds of SSA issuances, and while the long tenor (typically 10 years) can help reduce shorter term repayment problems, countries will often face much larger one-time repayment obligations than they have previously managed. Some countries have setup sinking funds to ensure adequate resources will be available to meet bullet repayments (e.g., Gabon). Others may be counting on rolling-over the bonds, but this can be expected to come at a higher cost than the yields enjoyed at issuance during historically easy global finance conditions.

The impact of bullet repayments can be seen quite starkly in the debt service ratios of recent DSAs. Recent DSAs for countries with the largest issuances in Table 4.3 provide good examples. Figure 4.4 shows the sharp jump in debt service obligations for each country where the bullet repayments are due, for example for Ghana starting in 2023 and for Kenya in 2019 and 2024. For Ghana, bullet repayments after 2023 for recent issuances contributes to a protracted breach of the baseline projection for the external debt service-to-revenue ratio, and hence the increased liquidity risks associated with sovereign bond issuances have caused Ghana's risk rating of external debt distress to deteriorate from moderate to high risk. Zambia and Cote D'Ivoire provide examples of where the elevated debt repayments associated with recent sovereign bond issuance cause shock scenarios to breach DSA thresholds and move the risk of debt distress to moderate. Rwanda and Senegal, though retaining a low risk rating in their most recent DSAs, face elevated risks from recent bond issuances and will need to manage large debt servicing spikes in the future. In contrast, debt service-to-revenue indicators for Kenya and Nigeria remain well below their policy-dependent thresholds given the relatively low initial levels of debt servicing.

The experience of using international sovereign bonds to finance large infrastructure initiatives is mixed. Coordinating the availability and magnitude of bond proceeds with time-sensitive project financing needs can be a challenge, especially in capacity constrained environments. There have been delays in the use of bond proceeds (e.g., Senegal and Zambia), though this is not an Africa-only phenomenon. Mongolia, for example, had a very successful sovereign bond issuance in 2012, yet the proceeds could not be fully utilized in the near term. This illustrates the risk of incurring significant carrying costs for idle funds. In addition, there may be the temptation in the face of investor over-subscription to borrow amounts beyond the public investment absorptive capacity of the government. In the larger context, debt sustainability will be negatively impacted because of lower-than-expected growth impacts from borrowing.

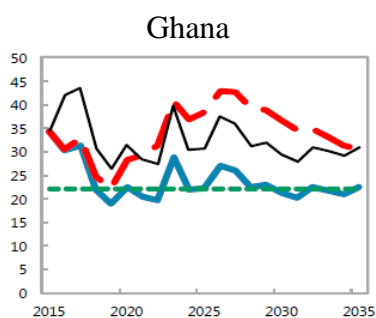
Lastly, it should be noted that the large resource flows into issuing countries may contribute to financial instability. As noted in Tyson (2015), increasing integration into international private capital markets, combined with financial liberalization and immature but developing domestic financial systems, can mix with sharp volatility in capital flows and lead to financial crisis and damaging macroeconomic instability. There may be a building risk of such events repeating in sub-Saharan Africa, especially in light of the reversal of monetary easing in developed economies.

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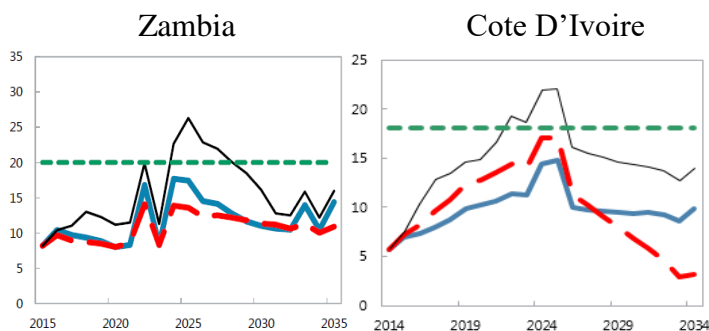
<sup>22</sup> A few countries (Cote D'Ivoire and Ghana), have spread amortization across 2 or even 3 years at the end of the sovereign bond tenor. While not a single bullet payment, debt servicing remains very compressed and continues to represent significant liquidity risk.

**Figure 4.4: Bullet Bond Repayments and Debt Service Indicators**

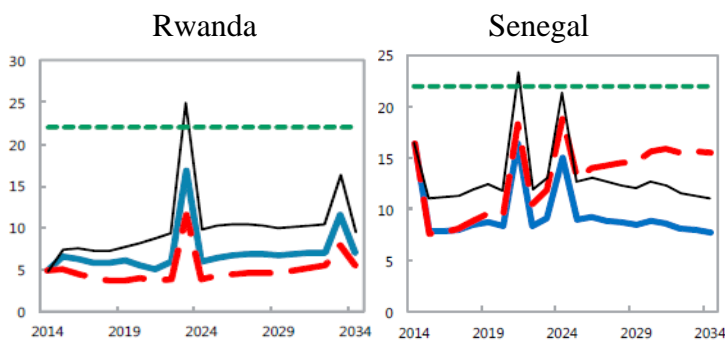
**High risk rating**



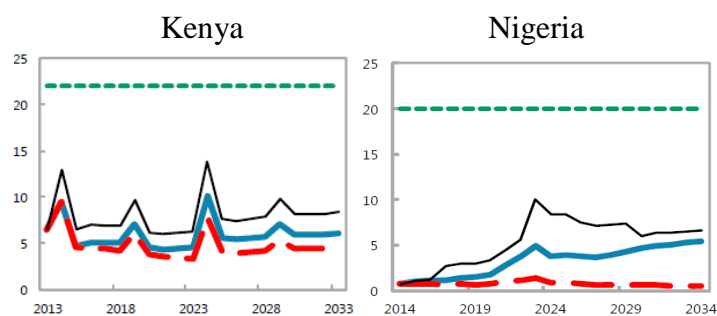
**Moderate risk rating**



**Low risk rating (but elevated)**



**Low risk rating**



Legend: — Baseline - - - Historical scenario — Most extreme shock  
- - - Threshold

Source: Joint WB/IMF DSAs: Rwanda Nov 2014; Senegal Dec 2014; Zambia May 2015; Ghana Aug 2015; Kenya Sep 2014; Cote D'Ivoire Nov 2014.

## Section 5. Conclusions

This paper analyses debt related risks in SSA countries using two distinct approaches. On the one hand trends since the early 1980s are examined to provide a long-term perspective; on the other, recent years are looked at in greater detail to assess countries' emerging vulnerabilities, especially since debt relief.

The long-term perspective allows us to conclude that overall, the debt situation in SSA has significantly improved when compared to the situation prevailing since the mid-eighties and until the early 2000s. Debt relief (up to 2009) and faster GDP growth played the largest roles in reducing public debt-to-GDP ratios in SSA countries during the 2000s. The main reductions in debt, however, occurred before the onset of the 2008 global financial crisis, as starting in 2009 countries began running larger fiscal deficits to counteract for the slowdown in growth. In terms of external debt, debt relief (up to 2009) and FDI inflows were the main driving forces of debt reduction in SSA countries during the 2000s, as GDP growth played a smaller role and current account imbalances significantly contributed to debt increases throughout the entire 2000s. These results, however, greatly differ across country groups, as commodity exporters benefited largely from surges in export prices while low income and fragile economies received the bulk of debt relief. Going forward, fiscal tightening and higher economic growth are expected to contribute to a reduction in public debt. On the other hand, the external debt-to-GDP ratios are expected to remain stable on the average for the SSA region. Although current account deficits are expected to systematically contribute to the accumulation of external debt among SSA countries, this contribution is expected to be mostly offset by sustained net FDI inflows along with a smaller contribution from GDP growth. Again, these roles vary among country groups.

A closer look at developments in recent years further unmasks a high degree of heterogeneity among SSA countries. In fact, as some countries have taken advantage of the current favorable financial conditions prevailing in international capital markets, and others benefited from the surge in commodity prices, cases of rapid increases in indebtedness are notable. Given the volatility of the global economy and prospective reversal of the loose monetary stance in developed economies, these increases in debt warrant a closer monitoring by policy makers as they may lead to future debt sustainability problems.

The heterogeneity of SSA countries also surfaces when looking into their dependence on FDI and workers' remittances as a source of foreign exchange. In both cases the high concentration of these flows in a relatively small group of countries underscores the vulnerability of a few to swift changes in external conditions – higher and protracted rates of unemployment in host countries and changes in market sentiment – that might reduce these inflows and lead to liquidity problems. Similarly, for some countries the recent access to foreign capital markets appears to have significantly exacerbated their foreign exchange exposure and their liquidity risks, as recent bond issues have been accompanied by repayment structures comprising large repayment bullets.

In addition, to identify other potential risks that countries face, we use the Debt Sustainability Framework jointly developed by the World Bank and the IMF, to assess the sensitivity of SSA LICs to different standardized shocks, and the effects of two specific tailored shocks, namely, the sharp drop in the price of oil in the second part of last year – that adversely affects oil exporting countries – and the slowdown in China's growth jointly with the sluggish recovery in the Euro Zone.

With regards to the sensitivity of LICs to standardized shocks, we conclude that they mainly affect the countries' solvency indicators, and the effects are marginally larger on fragile economies and HIPCs. The results from the tailored shocks, both of which are applied uniformly across SSA countries whose latest available DSA – done either in 2013 or early 2014 – does not capture them, show that with the exception of Cameroon, the country with the lowest shares of oil in total exports and in revenues, all other three oil exporters – Chad, Nigeria and Republic of Congo – are significantly affected by the drop in oil prices as

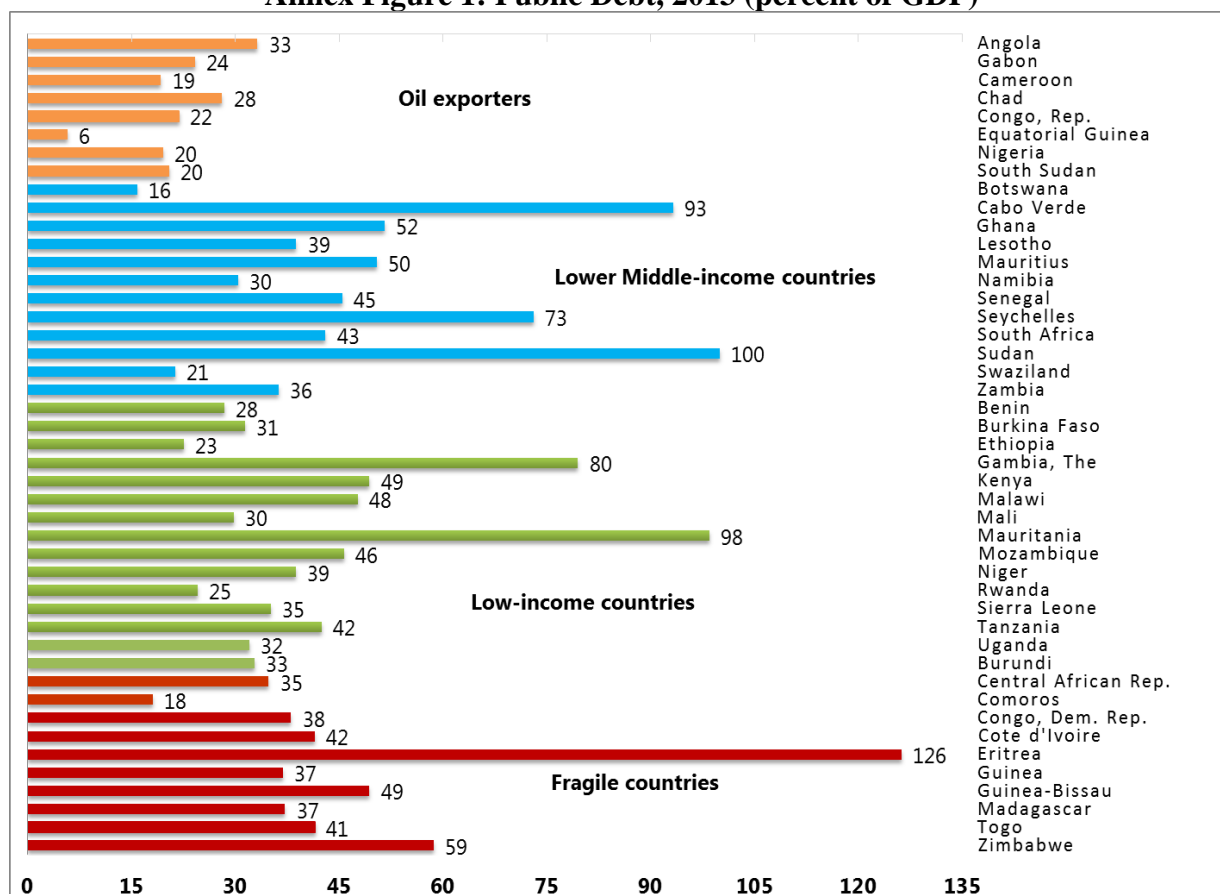


their debt burden indicators deteriorate significantly. On the contrary, the sluggish recovery in Europe and slower growth in China affects only a minority group of countries (7 out of 24), in particular those whose main export market is the Euro Zone.

## REFERENCES

- IMF (2014). Regional Economic Outlook, Sub-Saharan Africa, World Economic and Financial Surveys, International Monetary Fund (IMF), Washington D.C. (October).
- Merotto, Dino, Tihomir Stucka, and Mark R. Thomas (2015), “African Debt since HIPC: How Clean is the Slate?” MFM WP Series Number 2, The World Bank (March).
- Painchaud, François and Tihomir Stučka (2011), “Stress testing in the Debt Sustainability Framework (DSF) for Low-Income Countries”, mimeo (May).
- Tyson, Judith (2015). “Sub-Saharan Africa International Sovereign Bonds”. Overseas Development Institute.
- UNCTAD (2014). “World Investment Report 2014”. UNCTAD, Geneva.
- World Bank (2015). Migration and Remittances Team website. [Migrationandremittances@worldbank.org](http://migrationandremittances@worldbank.org).
- World Bank (2015). Private Participation in Infrastructure Database. <http://ppi.worldbank.org/index.aspx>.
- World Bank and IMF (2012). “Revisiting the Debt Sustainability Framework for Low-Income Countries”.

**Annex Figure 1: Public Debt, 2013 (percent of GDP)**



**Note 1:** Country classification uses the following criteria:

- A country is classified as an oil-exporter if its net oil exports represent at least 30 percent of its total exports.
- A country is defined as fragile if its International Development Association (IDA) Resource Allocation Index score<sup>23</sup> (CPIA) is below 3.2 and the country is not an oil exporter.
- A country is considered to be a low income economy if its average gross national income (GNI) per capita is below USD 1,035<sup>24</sup> and is neither oil exporting nor fragile.
- Economies with an average GNI per capita greater than USD 1,035 which are neither oil exporters nor fragile economies are classified as lower middle income countries.

Source: *Regional Economic Outlook, Sub-Saharan Africa*, World Economic and Financial Surveys, International Monetary Fund (IMF), Washington D.C. October 2014

<sup>23</sup> See the World Bank Group, CPIA database (<http://www.worldbank.org/ida>).

<sup>24</sup> The average considers the years 2011–13. The GNI per capita uses the Atlas method.

**Annex Table 1: Sample of Countries**

cname	Projection Year	DSA	Non-overlapping group	HIPC status	CPIA	Risk of debt distress
Benin	2014	FY14	LIC	CP	3.5	Low
Burkina Faso	2014	FY14	LIC	CP	3.8	Moderate
Burundi	2013	FY14	Fragile	CP	3.1	Low
Cabo Verde	2013	FY14	LMIC	nonhipc	4.0	Moderate
Cameroon	2014	FY14	Oil exporting	CP	3.2	Low
Central African Rep.	2013	FY14	Fragile	CP	2.7	High
Chad	2013	FY14	Oil exporting	DP	2.4	Low
Comoros	2014	FY14	Fragile	CP	2.7	Moderate
Congo, Dem. Rep	2013	FY14	Fragile	CP	2.7	Moderate
Congo, Rep.	2013	FY14	Oil exporting	CP	2.9	Low
Côte d'Ivoire	2014	FY14	Fragile	CP	3.0	Moderate
Ethiopia	2014	FY14	LIC	CP	3.4	Low
Gambia, The	2014	FY14	LIC	CP	3.4	Moderate
Ghana	2014	FY14	LMIC	CP	3.8	Low
Guinea	2013	FY13	Fragile	CP	2.8	Moderate
Guinea-Bissau	2013	FY13	Fragile	CP	2.7	Moderate
Kenya	2013	FY13	LIC	nonhipc	3.8	Low
Malawi	2013	FY13	LIC	CP	3.2	Moderate
Mali	2014	FY14	LIC	CP	3.5	Low
Mauritania	2014	FY14	LIC	CP	3.2	High
Mozambique	2014	FY14	LIC	CP	3.7	Moderate
Niger	2014	FY14	LIC	CP	3.4	Moderate
Nigeria	2013	FY14	Oil exporting	nonhipc	3.5	Low
Rwanda	2013	FY14	LIC	CP	3.8	Low
Senegal	2014	FY14	LMIC	CP	3.8	Low
Sierra Leone	2013	FY13	LIC	CP	3.3	Low
Sudan	2014	FY14	LMIC	pre-DP	2.4	In debt distress
São Tomé and Príncipe	2014	FY14	Fragile	CP	3.0	High
Tanzania	2014	FY14	LIC	CP	3.7	Low
Togo	2013	FY13	Fragile	CP	2.9	Low
Uganda	2014	FY14	LIC	CP	3.8	Low
Zambia	2013	FY14	LMIC	CP	3.5	Low
Zimbabwe	2013	FY14	Fragile	nonhipc	2.1	In debt distress

**Annex Table 2**  
**Public Sector Debt Sustainability Analysis (DSA) - Baseline Scenario for SSA**  
(in percent of GDP unless otherwise indicated)

	2006-2011	2012	2013	2014	2015	2016	2017	2018	2019
Public sector debt	50.4	42.9	43.5	45.5	45.0	44.3	43.4	42.4	41.1
o/w foreign-currency denominated	38.3	30.0	30.3	32.5	32.6	32.5	32.1	31.5	30.7
Change in gross public sector debt	-7.8	-0.6	0.6	2.0	-0.5	-0.7	-0.9	-1.1	-1.2
Identified debt-creating flows	-8.7	-0.8	-0.2	0.6	-1.4	-1.3	-1.6	-1.5	-1.8
Primary deficit	0.1	1.9	1.8	2.2	1.6	1.1	1.0	0.9	0.6
Primary (noninterest) revenue and grants	22.7	23.4	23.1	23.2	23.5	23.8	23.8	23.7	23.5
Primary (noninterest) expenditure	22.8	25.4	24.9	25.4	25.1	24.9	24.8	24.6	24.1
Automatic debt dynamics	-5.0	-1.7	-1.8	-1.6	-2.4	-2.4	-2.6	-2.4	-2.3
Interest rate/growth differential	-3.6	-2.7	-1.3	-2.1	-2.3	-2.2	-2.4	-2.3	-2.2
Of which: real interest rate	-1.1	-0.4	-0.1	0.2	0.2	0.3	0.3	0.2	0.2
Of which: real GDP growth	-2.6	-2.3	-1.2	-2.3	-2.5	-2.5	-2.7	-2.5	-2.4
Exchange rate depreciation	-1.4	1.0	-0.4	0.4	-0.1	-0.2	-0.2	-0.1	-0.1
Other identified debt-creating flows	-3.9	-1.0	-0.2	0.0	-0.6	0.0	0.0	0.0	0.0
Privatization receipts (negative)	-0.3	-0.1	-0.1	-0.2	-0.1	0.0	0.0	0.0	0.0
Contingent liabilities	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0
Debt relief (HIPC and other)	-3.6	-1.0	-0.1	0.0	-0.5	0.0	0.0	0.0	0.0
Residual, including asset changes	0.9	0.2	0.8	1.5	0.9	0.6	0.7	0.5	0.5

Source: Authors' calculations based on 33 SSA countries DSAs done by IMF and World Bank staff.

**Annex Table 3**  
**External Debt Sustainability Analysis (DSA) - Baseline Scenario for SSA**  
(in percent of GDP, unless otherwise indicated)

	2006-2011	2012	2013	2014	2015	2016	2017	2018	2019
<b>External debt (nominal)</b> <sup>1/</sup>	43.7	36.4	37.4	40.0	40.9	41.2	41.4	41.3	40.8
Of which: public and publicly guaranteed (PPG)	38.1	29.7	30.1	32.1	32.2	32.2	31.8	31.2	30.5
Change in external debt	-7.8	0.1	1.0	2.6	0.8	0.4	0.1	-0.1	-0.5
Identified net debt-creating flows	-3.0	4.1	3.2	3.0	2.6	1.6	0.8	1.0	0.7
<b>Non-interest current account deficit</b>	6.9	11.7	11.1	11.4	10.7	10.2	9.4	8.9	8.0
Deficit in balance of goods and services	10.6	14.2	14.3	14.4	13.2	12.2	11.2	10.8	9.6
Exports	27.8	30.1	29.5	29.4	29.3	29.5	30.0	30.3	30.2
Imports	38.5	44.3	43.8	43.7	42.5	41.7	41.3	41.1	39.7
Net current transfers (negative = inflow)	-8.4	-8.1	-8.2	-7.8	-7.5	-7.1	-6.8	-6.6	-6.4
Of which: official	-3.7	-3.2	-3.2	-3.0	-2.8	-2.5	-2.3	-2.3	-2.2
Other current account flows (negative = net inflow)	4.6	5.7	5.0	4.8	5.0	5.1	4.9	4.7	4.8
<b>Net FDI (negative = inflow)</b>	-5.5	-6.7	-6.4	-6.5	-6.2	-6.1	-5.8	-5.1	-4.6
<b>Endogenous debt dynamics</b> <sup>2/</sup>	-4.4	-0.9	-1.6	-1.9	-1.9	-2.5	-2.8	-2.8	-2.6
Contribution from nominal interest rate	0.8	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7
Contribution from real GDP growth	-2.1	-2.0	-1.3	-1.9	-2.1	-2.2	-2.4	-2.4	-2.3
Contribution from price and exchange rate changes	-3.1	0.5	-0.9	-0.7	-0.5	-1.0	-1.1	-1.1	-1.0
<b>Residual</b> <sup>3/</sup>	-4.9	-4.0	-2.2	-0.4	-1.7	-1.2	-0.6	-1.1	-1.3
of which: exceptional financing	-1.7	-2.4	-0.4	-0.3	0.2	-0.3	-0.3	-0.2	-0.2

Source: Authors' calculations based on 33 SSA countries DSAs done by IMF and World Bank staff.

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  $\rho$  = 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.

## Annex Table 4A: Effects of oil price shock on projected external DSA indicators, 2015-2034

EXTERNAL DSA														
PV of debt-to GDP ratio			CHAD			NIGERIA			CAMEROON			REP. OF CONGO		
Difference with original baseline (pp)	Max	Length (yrs)	Average	Max	Length (yrs)	Average	Max	Length (yrs)	Average	Max	Length (yrs)	Average		
	Deviation	of deviation	deviation	Deviation	of deviation	deviation	Deviation	of deviation	deviation	Deviation	of deviation	deviation		
Fiscal Financing	10	17	5	37	11	16	3	17	2	29	17	16		
CAB financing	19	17	10	54	11	23	9	17	5	48	17	25		
Difference with Threshold (pp)	Max	Length (yrs)	Average	Max	Length (yrs)	Average	Max	Length (yrs)	Average	Max	Length (yrs)	Average		
	Breach	of breach	breach	Breach	of breach	breach	Breach	of breach	breach	Breach	of breach	breach		
Original														
Fiscal Financing										7	8	4		
CAB financing	5	6	3	18	3	15	0	0		26	10	17		
PV of debt-to exports ratio			CHAD			NIGERIA			CAMEROON			REP. OF CONGO		
Difference with original baseline (pp)	Max	Length (yrs)	Average	Max	Length (yrs)	Average	Max	Length (yrs)	Average	Max	Length (yrs)	Average		
	Deviation	of deviation	deviation	Deviation	of deviation	deviation	Deviation	of deviation	deviation	Deviation	of deviation	deviation		
Fiscal Financing	74	17	39	159	11	71	22	17	11	61	17	32		
CAB financing	125	17	63	229	11	100	47	17	25	98	17	49		
Difference with Threshold (pp)	Max	Length (yrs)	Average	Max	Length (yrs)	Average	Max	Length (yrs)	Average	Max	Length (yrs)	Average		
	Breach	of breach	breach	Breach	of breach	breach	Breach	of breach	breach	Breach	of breach	breach		
Original	57	12	37											
Fiscal Financing	83	16	54	22	1	22								
CAB financing	133	18	69	92	5	38	2	2	1	11	3	9		
PV of debt-to revenue ratio			CHAD			NIGERIA			CAMEROON			REP. OF CONGO		
Difference with original baseline (pp)	Max	Length (yrs)	Average	Max	Length (yrs)	Average	Max	Length (yrs)	Average	Max	Length (yrs)	Average		
	Deviation	of deviation	deviation	Deviation	of deviation	deviation	Deviation	of deviation	deviation	Deviation	of deviation	deviation		
Fiscal Financing	86	17	45	187	11	91	22	17	12	90	17	48		
CAB financing	147	17	73	273	11	129	58	17	31	146	17	75		
Difference with Threshold (pp)	Max	Length (yrs)	Average	Max	Length (yrs)	Average	Max	Length (yrs)	Average	Max	Length (yrs)	Average		
	Breach	of breach	breach	Breach	of breach	breach	Breach	of breach	breach	Breach	of breach	breach		
Original														
Fiscal Financing														
CAB financing	46	6	29	39	3	31								
Debt service-to exports ratio			CHAD			NIGERIA			CAMEROON			REP. OF CONGO		
Difference with original baseline (pp)	Max	Length (yrs)	Average	Max	Length (yrs)	Average	Max	Length (yrs)	Average	Max	Length (yrs)	Average		
	Deviation	of deviation	deviation	Deviation	of deviation	deviation	Deviation	of deviation	deviation	Deviation	of deviation	deviation		
Fiscal Financing	12	19	5	37	10	19	1	9	1	10	19	4		
CAB financing	22	19	8	58	10	27	1	9	1	17	19	6		
Difference with Threshold (pp)	Max	Length (yrs)	Average	Max	Length (yrs)	Average	Max	Length (yrs)	Average	Max	Length (yrs)	Average		
	Breach	of breach	breach	Breach	of breach	breach	Breach	of breach	breach	Breach	of breach	breach		
Original														
Fiscal Financing	8	10	4	18	5	10								
CAB financing	19	10	10	39	6	21				4	3	2		
Debt service-to revenue ratio			CHAD			NIGERIA			CAMEROON			REP. OF CONGO		
Difference with original baseline (pp)	Max	Length (yrs)	Average	Max	Length (yrs)	Average	Max	Length (yrs)	Average	Max	Length (yrs)	Average		
	Deviation	of deviation	deviation	Deviation	of deviation	deviation	Deviation	of deviation	deviation	Deviation	of deviation	deviation		
Fiscal Financing	9	19	4	44	10	21	1	9	0	13	19	5		
CAB financing	18	19	7	69	10	32	1	9	0	22	19	8		
Difference with Threshold (pp)	Max	Length (yrs)	Average	Max	Length (yrs)	Average	Max	Length (yrs)	Average	Max	Length (yrs)	Average		
	Breach	of breach	breach	Breach	of breach	breach	Breach	of breach	breach	Breach	of breach	breach		
Original														
Fiscal Financing	4	3	2	25	5	15								
CAB financing	9	7	6	50	6	28				6	4	3		

Source: Authors' calculations based on country DSAs.

## Annex Table 4B: Effects of oil price shock on projected fiscal DSA indicators, 2015-2034

FISCAL DSA														
PV of debt-to GDP ratio			CHAD			NIGERIA			CAMEROON			REP. OF CONGO		
Difference with original baseline (pp)	Max	Length (yrs)	Average	Max	Length (yrs)	Average	Max	Length (yrs)	Average	Max	Length (yrs)	Average		
	Deviation	of deviation	deviation	Deviation	of deviation	deviation	Deviation	of deviation	deviation	Deviation	of deviation	deviation		
Fiscal Financing	10	17	6	37	11	16	4	17	2	29	17	16		
CAB financing	19	17	10	54	11	23	10	17	5	48	17	25		
PV of debt-to revenue ratio			CHAD			NIGERIA			CAMEROON			REP. OF CONGO		
Difference with original baseline (pp)	Max	Length (yrs)	Average	Max	Length (yrs)	Average	Max	Length (yrs)	Average	Max	Length (yrs)	Average		
	Deviation	of deviation	deviation	Deviation	of deviation	deviation	Deviation	of deviation	deviation	Deviation	of deviation	deviation		
Fiscal Financing	76	17	40	220	11	107	30	17	16	90	17	48		
CAB financing	128	17	65	303	11	145	65	17	35	145	17	75		
Debt service-to revenue ratio			CHAD			NIGERIA			CAMEROON			REP. OF CONGO		
Difference with original baseline (pp)	Max	Length (yrs)	Average	Max	Length (yrs)	Average	Max	Length (yrs)	Average	Max	Length (yrs)	Average		
	Deviation	of deviation	deviation	Deviation	of deviation	deviation	Deviation	of deviation	deviation	Deviation	of deviation	deviation		
Fiscal Financing	9	19	4	47	10	23	1	9	1	13	19	6		
CAB financing	16	19	7	72	10	33	1	9	1	22	19	8		

Source: Authors' calculations based on country DSAs.

**Annex Table 5: Country classification by main export market**

Main export market		
Euro Zone	China	SSA
Cabo Verde	Congo, Dem. Rep.	Guinea-Bissau
Cameroon	Congo, Rep.	Kenya
Comoros	Mauritania	Malawi
Cote d'Ivoire	Sudan	Rwanda
Ethiopia		Senegal
Ghana		Togo
Guinea		Uganda
Mozambique		Zambia
Nigeria		
Sao Tome and Principe		
Sierra Leone		
Zimbabwe		



**Annex Table 6: Effects of export slowdown on projected external DSA indicators, 2015-onward**

		<b>Cape verde</b>			<b>Guinea</b>			<b>Sao Tome &amp; Principe</b>		
		Max deviation	Length (yrs) of deviation	Average deviation	Max deviation	Length (yrs) of deviation	Average deviation	Max deviation	Length (yrs) of deviation	Average deviation
Baseline	PV of debt-to-exports ratio	0	0		0	0		275.5	16.0	163.9
	Debt service-to-exports ratio	0	0		0	0		6.1	10.0	2.3
After shock	PV of debt-to-exports ratio	0	0		0	0		350.8	21.0	262.7
	Debt service-to-exports ratio	0	0		0	0		17.2	21.0	10.2
Worsening after shock		Max	Mean	Std deviation	Max	Mean	Std deviation	Max	Mean	Std deviation
	PV of debt-to-exports ratio	11.21	8.46	3.74	8.65	6.23	3.06	211.6	144.6	70.14
	Debt service-to-exports ratio	2.91	1.55	0.81	0.67	0.05	0.75	22.50	10.82	7.80
		<b>Cameroon</b>			<b>Guinea-Bissau</b>			<b>Senegal</b>		
		Max deviation	Length (yrs) of deviation	Average deviation	Max deviation	Length (yrs) of deviation	Average deviation	Max deviation	Length (yrs) of deviation	Average deviation
Baseline	PV of debt-to-exports ratio	0	0		21.6	4.0	8.9	0	0	
	Debt service-to-exports ratio	0	0		0.0	0.0		0	0	
After shock	PV of debt-to-exports ratio	72.12	12.00	44.20	21.6	4.0	9.2	0	0	
	Debt service-to-exports ratio	0	0		0.0	0.0		0	0	
Worsening after shock		Max	Mean	Std deviation	Max	Mean	Std deviation	Max	Mean	Std deviation
	PV of debt-to-exports ratio	119.00	57.81	40.68	14.63	7.07	4.97	23.40	10.62	7.25
	Debt service-to-exports ratio	2.84	1.43	0.95	1.20	0.43	0.44	1.93	0.78	0.64
		<b>Comoros</b>			<b>Kenya</b>			<b>Sierra Leone</b>		
		Max deviation	Length (yrs) of deviation	Average deviation	Max deviation	Length (yrs) of deviation	Average deviation	Max deviation	Length (yrs) of deviation	Average deviation
Baseline	PV of debt-to-exports ratio	86.03	13.00	41.38	0	0		0	0	
	Debt service-to-exports ratio	0	0		0	0		0	0	
After shock	PV of debt-to-exports ratio	265.4	17.0	122.4	0	0		0	0	
	Debt service-to-exports ratio	9.97	6.00	5.07	0	0		0	0	
Worsening after shock		Max	Mean	Std deviation	Max	Mean	Std deviation	Max	Mean	Std deviation
	PV of debt-to-exports ratio	179.3	76.5	58.6	25.03	10.62	8.32	66.37	34.31	21.43
	Debt service-to-exports ratio	14.5	5.0	4.9	1.83	0.60	0.59	6.49	2.84	2.51
		<b>Congo, Dem. Rep.</b>			<b>Malawi</b>			<b>Togo</b>		
		Max deviation	Length (yrs) of deviation	Average deviation	Max deviation	Length (yrs) of deviation	Average deviation	Max deviation	Length (yrs) of deviation	Average deviation
Baseline	PV of debt-to-exports ratio	0	0		0	0		0	0	
	Debt service-to-exports ratio	0	0		0	0		0	0	
After shock	PV of debt-to-exports ratio	0	0		0	0		0	0	
	Debt service-to-exports ratio	0	0		0	0		0	0	
Worsening after shock		Max	Mean	Std deviation	Max	Mean	Std deviation	Max	Mean	Std deviation
	PV of debt-to-exports ratio	12.17	7.14	4.37	9.25	4.02	3.06	19.11	8.12	6.57
	Debt service-to-exports ratio	1.29	0.53	0.49	0.05	0.03	0.02	1.97	0.67	0.70
		<b>Cote d' Ivoire</b>			<b>Mozambique</b>			<b>Uganda</b>		
		Max deviation	Length (yrs) of deviation	Average deviation	Max deviation	Length (yrs) of deviation	Average deviation	Max deviation	Length (yrs) of deviation	Average deviation
Baseline	PV of debt-to-exports ratio	0	0		0	0		0	0	
	Debt service-to-exports ratio	0	0		0	0		0	0	
After shock	PV of debt-to-exports ratio	4.68	6.00	3.61	95.72	11.00	64.94	0	0	
	Debt service-to-exports ratio	0	0		6.86	5.00	4.73	0	0	
Worsening after shock		Max	Mean	Std deviation	Max	Mean	Std deviation	Max	Mean	Std deviation
	PV of debt-to-exports ratio	84.80	46.17	28.92	183.23	100.62	65.54	18.62	8.35	6.29
	Debt service-to-exports ratio	8.37	3.48	2.92	20.71	7.45	7.52	1.54	0.54	0.52
		<b>Ethiopia</b>			<b>Nigeria</b>			<b>Zambia</b>		
		Max deviation	Length (yrs) of deviation	Average deviation	Max deviation	Length (yrs) of deviation	Average deviation	Max deviation	Length (yrs) of deviation	Average deviation
Baseline	PV of debt-to-exports ratio	0	0		0	0		0	0	
	Debt service-to-exports ratio	0	0		0	0		0	0	
After shock	PV of debt-to-exports ratio	6.7612	3.0000	3.7176	0	0		0	0	
	Debt service-to-exports ratio	0	0		0	0		0	0	
Worsening after shock		Max	Mean	Std deviation	Max	Mean	Std deviation	Max	Mean	Std deviation
	PV of debt-to-exports ratio	52.47	35.43	16.64	24.58	5.94	8.77	15.575	7.534	5.394
	Debt service-to-exports ratio	4.73	2.56	1.69	1.46	0.17	0.44	1.622	0.578	0.572
		<b>Ghana</b>			<b>Rwanda</b>			<b>Zimbabwe</b>		
		Max deviation	Length (yrs) of deviation	Average deviation	Max deviation	Length (yrs) of deviation	Average deviation	Max deviation	Length (yrs) of deviation	Average deviation
Baseline	PV of debt-to-exports ratio	0	0		0	0		71.21	19.00	27.18
	Debt service-to-exports ratio	0	0		0	0		0.00	0.00	
After shock	PV of debt-to-exports ratio	0	0		0	0		249.03	21.00	144.72
	Debt service-to-exports ratio	0	0		0	0		9.72	7.00	4.97
Worsening after shock		Max	Mean	Std deviation	Max	Mean	Std deviation	Max	Mean	Std deviation
	PV of debt-to-exports ratio	75.3	40.5	23.8	19.17	8.42	6.61	251.21	120.27	85.31
	Debt service-to-exports ratio	11.9	5.6	4.1	1.54	0.50	0.51	20.93	6.97	7.53

Note: Projection horizons covered until 2033-34, depending on the whether the latest DSA was conducted in 2013 or 2014.

Source: Authors' calculations based on country DSAs.

**Annex Table 7: Deviations from threshold pre- and post DSA shocks in SSA countries  
(Percentage points)**

**7A: Public DSA, Debt-to GDP ratio**

GROUP	STRESS TESTS	Situation post-shock			situation pre-shock		
		Max Breach	Length (yrs) of deviation	Average deviation	Max Breach	Length (yrs) of deviation	Average deviation
Whole sample	A2	83.1	7.4	10.0	122.1	2.9	4.4
	A3	165.8	4.2	8.7			
	B1	178.6	5.6	9.4			
	B4	80.8	4.3	5.1			
Fragile	A2	38.9	8.9	5.7	122.1	4.6	6.2
	A3	165.8	5.1	13.4			
	B1	178.6	7.7	18.8			
	B4	80.8	5.7	6.0			
Oil Exporting	A2	35.4	4.5	3.6	26.8	3.5	2.3
	A3	65.7	6.5	6.9			
	B1	40.2	11.0	8.8			
	B4	28.1	3.8	2.6			
Frontier LIC	A2	52.7	6.1	6.2	122.1	1.6	5.0
	A3	165.8	1.6	6.7			
	B1	178.6	2.2	8.4			
	B4	80.8	3.8	3.8			
HIPC (post CP)	A2	55.0	7.2	6.8	122.1	2.6	2.6
	A3	165.8	3.1	4.0			
	B1	178.6	5.1	5.7			
	B4	80.8	3.9	3.0			

**7B: External DSA, Solvency indicators**

GROUP	DEBT BURDEN	STRESS TESTS	Situation post-shock			situation pre-shock		
			Deviation from Threshold			Deviation from Threshold		
			Max Breach	Length (yrs) of deviation	Average deviation	Max Breach	Length (yrs) of deviation	Average deviation
Whole sample	PV of Debt to GDP	A2	227.6	3.2	6.0	123.4	2.0	2.9
	PV of Debt to Revenue	A2	2326.4	1.1	50.2	1304.3	0.5	28.1
	PV of Debt to Exports	A2	349.6	5.1	23.7	275.5	2.5	14.1
	PV of Debt to GDP	B1	151.0	2.1	4.9			
	PV of Debt to Revenue	B1	1575.0	0.8	34.6			
	PV of Debt to Exports	B1	278.1	2.5	13.7			
	PV of Debt to GDP	B2	124.8	3.2	4.6			
	PV of Debt to Revenue	B2	1318.1	1.0	30.0			
	PV of Debt to Exports	B2	429.6	5.7	32.2			
	PV of Debt to GDP	B6	200.8	4.4	6.3			
PV of Debt to Revenue	B6	2063.0	1.4	49.8				
PV of Debt to Exports	B6	278.1	2.5	13.7				
Fragile	PV of Debt to GDP	A2	227.6	5.8	11.1	123.4	4.1	5.8
	PV of Debt to Revenue	A2	2326.4	2.6	98.0	1304.3	1.6	54.4
	PV of Debt to Exports	A2	349.6	12.0	46.3	275.5	7.9	27.0
	PV of Debt to GDP	B1	151.0	4.3	8.7			
	PV of Debt to Revenue	B1	1575.0	2.5	67.0			
	PV of Debt to Exports	B1	278.1	7.9	27.1			
	PV of Debt to GDP	B2	124.8	5.1	7.0			
	PV of Debt to Revenue	B2	1318.1	3.0	56.0			
	PV of Debt to Exports	B2	429.6	12.9	64.5			
	PV of Debt to GDP	B6	200.8	6.2	11.6			
PV of Debt to Revenue	B6	2063.0	3.2	91.3				
PV of Debt to Exports	B6	278.1	7.9	27.1				
Oil Exporting	PV of Debt to GDP	A2	0.0	0.0	0.0	0.0	0.0	0.0
	PV of Debt to Revenue	A2	0.0	0.0	0.0	0.0	0.0	0.0
	PV of Debt to Exports	A2	64.2	1.8	2.6	0.0	0.0	0.0
	PV of Debt to GDP	B1	0.0	0.0	0.0			
	PV of Debt to Revenue	B1	0.0	0.0	0.0			
	PV of Debt to Exports	B1	0.0	0.0	0.0			
	PV of Debt to GDP	B2	10.5	4.3	0.9			
	PV of Debt to Revenue	B2	10.6	0.3	0.1			
	PV of Debt to Exports	B2	153.1	7.0	23.5			
	PV of Debt to GDP	B6	6.4	1.0	0.2			
PV of Debt to Revenue	B6	0.0	0.0	0.0				
PV of Debt to Exports	B6	0.0	0.0	0.0				
Frontier LIC	PV of Debt to GDP	A2	227.6	2.4	9.8	123.4	1.6	5.1
	PV of Debt to Revenue	A2	2326.4	1.6	106.8	1304.3	1.6	59.5
	PV of Debt to Exports	A2	285.5	1.4	13.2	129.6	1.3	5.4
	PV of Debt to GDP	B1	151.0	1.6	6.4			
	PV of Debt to Revenue	B1	1575.0	1.6	72.9			
	PV of Debt to Exports	B1	131.6	1.3	5.5			
	PV of Debt to GDP	B2	124.8	2.0	5.2			
	PV of Debt to Revenue	B2	1318.1	1.6	60.1			
	PV of Debt to Exports	B2	145.2	1.3	6.2			
	PV of Debt to GDP	B6	200.8	3.9	9.1			
PV of Debt to Revenue	B6	2063.0	1.6	97.0				
PV of Debt to Exports	B6	131.6	1.3	5.5				
HIPC (post CP)	PV of Debt to GDP	A2	227.6	2.6	4.3	123.4	1.6	2.0
	PV of Debt to Revenue	A2	2326.4	1.3	36.5	1304.3	0.6	20.2
	PV of Debt to Exports	A2	349.6	5.0	18.1	275.5	2.3	9.1
	PV of Debt to GDP	B1	151.0	1.6	2.6			
	PV of Debt to Revenue	B1	1575.0	0.7	24.7			
	PV of Debt to Exports	B1	278.1	2.3	9.1			
	PV of Debt to GDP	B2	124.8	2.5	2.3			
	PV of Debt to Revenue	B2	1318.1	1.0	20.6			
	PV of Debt to Exports	B2	429.6	5.2	18.2			
	PV of Debt to GDP	B6	200.8	3.9	4.3			
PV of Debt to Revenue	B6	2063.0	1.3	33.8				
PV of Debt to Exports	B6	278.1	2.3	9.1				

**7C: External DSA, Liquidity indicators**

GROUP	DEBT BURDEN	STRESS TESTS	Situation post-shock			situation pre-shock		
			Deviation from Threshold			Deviation from Threshold		
			Max	Length (yrs)	Average	Max	Length (yrs)	Average
			Breach	of deviation	deviation	Breach	of deviation	deviation
Whole sample	Debt Service to Revenue	A2	102.7	0.4	1.0	45.8	0.4	0.4
	Debt Service to Exports	A2	9.7	0.9	0.1	6.1	0.4	0.1
	Debt Service to Revenue	B1	57.9	0.4	0.6			
	Debt Service to Exports	B1	6.1	0.4	0.1			
	Debt Service to Revenue	B2	45.8	0.4	0.4			
	Debt Service to Exports	B2	14.5	1.4	0.3			
	Debt Service to Revenue	B6	6.1	0.9	1.0			
	Debt Service to Exports	B6	80.6	0.4	0.1			
Fragile	Debt Service to Revenue	A2	102.7	1.4	3.3	45.8	1.4	1.4
	Debt Service to Exports	A2	9.7	2.9	0.5	6.1	1.2	0.2
	Debt Service to Revenue	B1	57.9	1.4	1.9			
	Debt Service to Exports	B1	6.1	1.2	0.2			
	Debt Service to Revenue	B2	45.8	1.4	1.4			
	Debt Service to Exports	B2	14.5	2.7	0.7			
	Debt Service to Revenue	B6	80.6	1.5	2.9			
	Debt Service to Exports	B6	6.1	1.2	0.2			
Oil Exporting	Debt Service to Revenue	A2	0.0	0.0	0.0	0.0	0.0	0.0
	Debt Service to Exports	A2	0.0	0.0	0.0	0.0	0.0	0.0
	Debt Service to Revenue	B1	0.0	0.0	0.0			
	Debt Service to Exports	B1	0.0	0.0	0.0			
	Debt Service to Revenue	B2	0.0	0.0	0.0			
	Debt Service to Exports	B2	10.4	3.8	0.9			
	Debt Service to Revenue	B6	3.4	0.3	0.0			
	Debt Service to Exports	B6	0.0	0.0	0.0			
Frontier LIC	Debt Service to Revenue	A2	102.7	1.6	3.7	45.8	1.6	1.5
	Debt Service to Exports	A2	4.5	0.6	0.1	0.0	0.0	0.0
	Debt Service to Revenue	B1	57.9	1.6	2.1			
	Debt Service to Exports	B1	0.0	0.0	0.0			
	Debt Service to Revenue	B2	45.8	1.6	1.5			
	Debt Service to Exports	B2	0.0	0.0	0.0			
	Debt Service to Revenue	B6	80.6	3.0	3.6			
	Debt Service to Exports	B6	0.0	0.0	0.0			
HIPC (post CP)	Debt Service to Revenue	A2	102.7	0.5	1.2	45.8	0.5	0.5
	Debt Service to Exports	A2	9.7	1.1	0.2	6.1	0.5	0.1
	Debt Service to Revenue	B1	57.9	0.5	0.7			
	Debt Service to Exports	B1	6.1	0.5	0.1			
	Debt Service to Revenue	B2	45.8	0.5	0.5			
	Debt Service to Exports	B2	14.5	1.1	0.3			
	Debt Service to Revenue	B6	80.6	1.0	1.2			
	Debt Service to Exports	B6	6.1	0.5	0.1			