# 2. The Impact of Fiscal Consolidation on Growth in Sub-Saharan Africa

Many sub-Saharan African countries are facing a period of fiscal consolidation in order to ensure macroeconomic stability and sustainable growth. For the resource-intensive countries hit hard by the commodity price collapse, fiscal consolidation is urgent to offset likely permanent revenue losses. For other countries, especially those still growing fast, there may be less urgency for fiscal consolidation, but many have seen buffers eroded, and public debt and borrowing costs are on the rise.

The envisaged fiscal consolidation raises concerns as past episodes—both in the region and more broadly—have been associated with negative effects on growth. Against this backdrop, two related questions arise. How does output typically respond to spending cuts or revenue increases? And what policies can mitigate the impact of fiscal consolidation on output?

To answer these questions, this chapter examines the macroeconomic effects of changes in public expenditure and revenue in sub-Saharan African countries during 1990–2016.[1] The chapter begins by documenting some stylized facts from past fiscal consolidation episodes. Next, the extent to which changes in fiscal policy have knock-on effects on output in the short and medium term is analyzed. The chapter then focuses squarely on fiscal consolidation episodes to examine the impact on output and the role of policies and country characteristics in mitigating potential adverse effects. Based on the findings, the chapter concludes with policy recommendations.

The main findings are as follows:

- Estimated fiscal multipliers in sub-Saharan Africa tend to be smaller than those typically identified in advanced or emerging market economies. As detailed below, by examining the design of fiscal adjustments, institutional and country characteristics, and supporting policy environments, we are able to identify a number of factors contributing to these relatively low multipliers, as well as circumstances in which a larger impact should be expected.

- The impact of changes in fiscal policy on output suggests that it depends critically on whether these changes are expenditure or revenue based. Changing government investment by 1 percentage point of GDP changes output in the same direction by about 0.1 percent in the year of implementation, and by about 0.7 percent after three years. Changing public consumption has a smaller effect on output compared with public investment: after three years, a 1 percentage point of GDP change in government consumption results in a 0.5 percent change in output in the same direction. The impact of charging government revenues is smaller and statistically insignificant.

- Fiscal consolidation episodes also give rise to significant short- and medium-term output effects, depending on the types of fiscal measures used. Increasing the cyclically adjusted primary balance by 1 percentage point of GDP decreases output by 0.3 percent on impact, and by 0.4 percent over a three-year horizon. Fiscal consolidations based on reducing public investment have the largest contractionary effect:

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[1] There is extensive literature on the effects of fiscal policy on economic activity. See Gupta and others 2005, IMF 2010b, IMF 2014, DeLong and Summers 2012, Baum, Poplawski-Ribeiro, and Weber 2012, Ilzetzki, Mendoza, and Vegh 2013, Auerbach and Gorodnichenko 2013a, 2013b, Blanchard and Leigh 2013, Batini and others 2014, Dell'Erba, Koloskova, and Poplawski-Ribeiro 2014, Mineshima, Poplawski-Ribeiro, and Weber 2014, and Abiad, Furceri, and Topalova 2016. This chapter contributes to the existing literature by focusing on sub-Saharan Africa, and by distinguishing between the effects of government consumption, government investment, and revenue.

during these episodes, a 1 percentage point improvement in the cyclically adjusted primary balance reduces output by about 0.4 percent on impact and by 0.7 percent after three years. Finally, fiscal consolidations based on cuts in current expenditures have a smaller effect on economic growth (although the effect is statistically insignificant), while fiscal consolidations based on revenue mobilization decrease output less than those based on public investment cuts.

- The precise impact of a change in fiscal policy on output is determined by a range of factors: responses are larger in periods of low growth and smaller where public expenditure management and revenue administration are less efficient. In addition, accompanying policies can play an important mitigating role during fiscal consolidations. In particular, contractionary effects can be lessened in the presence of an accommodative monetary policy stance while keeping inflation in check; greater exchange rate flexibility, where possible; and the existence of solid external buffers and more openness to trade.

Difficult choices need to be made on the speed of fiscal consolidation and the appropriate instruments to use. Our results imply that countries can mitigate the negative impact of fiscal consolidation on growth, but it is imperative for countries to initiate the consolidation in a timely manner in order to avoid forced adjustments:

- Increasing revenue is the least costly, in terms of output, method of achieving fiscal consolidation. However, as revenue mobilization takes time, cuts in expenditures may be unavoidable in countries where fiscal consolidation is needed to regain macroeconomic stability. In some countries—such as in resource-intensive countries where large investment-to-GDP ratios reflect the scaling up of investment in the context of the resource boom—cutting capital investment may be the most effective instrument to achieve the urgently needed fiscal adjustment. The impact of this adjustment on growth will be smaller where public investment efficiency is low.

- Relatively low tax ratios and large potential for revenue mobilization in the region may help explain why revenue-based fiscal consolidations were found to have the smallest impact on growth. Our analysis suggests that on average, countries in the region could increase the tax-to-GDP ratio by 3½–5 percentage points of GDP, and this potential is even larger in oil exporters (Box 2.1).

- Cutting current expenditure appears less harmful for growth than cutting investment, but the composition of these expenditures also matters. Cuts can be achieved by following public expenditure reviews and streamlining—for example, by eliminating highly regressive and poorly targeted fuel subsidies (Box 2.2). However, cuts in current spending can have a substantial negative impact on households, in particular on low-income ones, so it is important to ensure that an appropriate social safety net is in place (Box 2.3). Further, spending on health and education needs to be protected as it has long-term implications for growth and development outcomes. Cutting capital expenditures can significantly impact growth outcomes, and should be based on streamlining and quality-based prioritization of projects.

- Going forward, creating fiscal space through the establishment of credible medium-term fiscal frameworks and fiscal rules can also reduce future needs for abrupt fiscal consolidations.

## LEARNING FROM THE PAST

Sub-Saharan Africa has undergone fiscal consolidations in the past, sometimes prompted by commodity price dips. Currently, the region is experiencing an environment where commodity exporters are facing a likely long period of low prices, and others are facing the need for adjustment due to mounting debt vulnerabilities (Chapter 1).

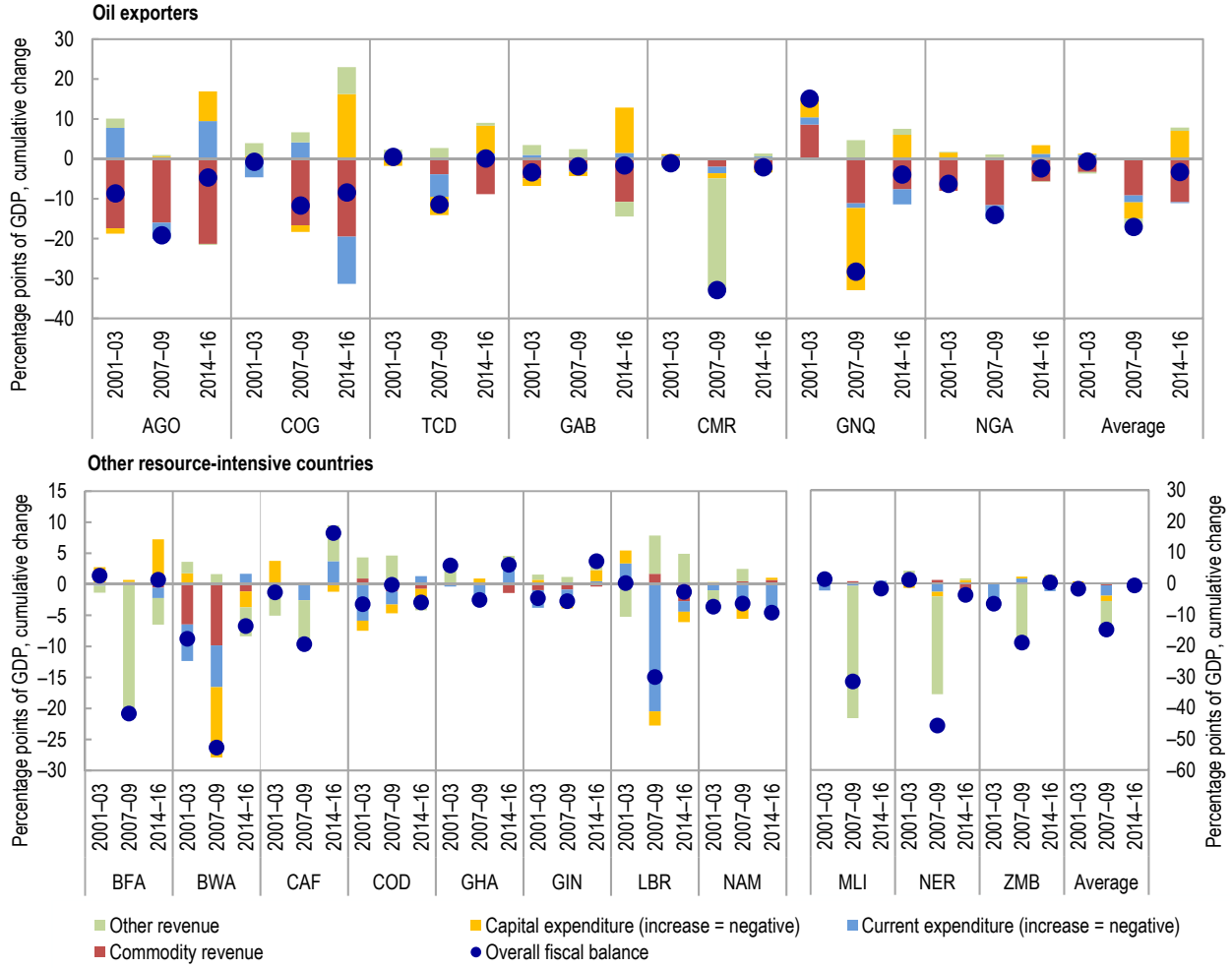
### Adjusting to Commodity Revenue Declines

This section starts by identifying three episodes of commodity revenue declines in the region—the beginning of the millennium (2001–03), the global financial crisis (2007–09), and the most recent episode (2014–16)—and then investigates the

magnitude of the declines in commodity revenues and the degree and composition of fiscal adjustment that followed. We find that:

- Most commodity exporters' fiscal balances did not revert to the level preceding the shortfall in commodity revenues: three years after a commodity revenue shortfall, overall fiscal balances usually continued to be weaker (Figure 2.1). While fiscal balances have generally not fully adjusted back in the current episode either, several oil exporters (Angola, Gabon) have already recovered a substantial share of the shortfall.
- Commodity revenue shortfalls were generally not fully offset by increases in other revenues. When noncommodity revenues increased within the three years after the commodity revenue shortfall, the increase in other revenue only covered a fraction of the initial shortfall (for example, in Angola, Botswana, and the Republic of Congo), highlighting the scope for further revenue mobilization.
- Developments in expenditures varied across episodes. While expenditures on average expanded during the global financial crisis and remained flat for oil exporters in the early 2000s, they have been the main source of adjustment in the past three years, especially

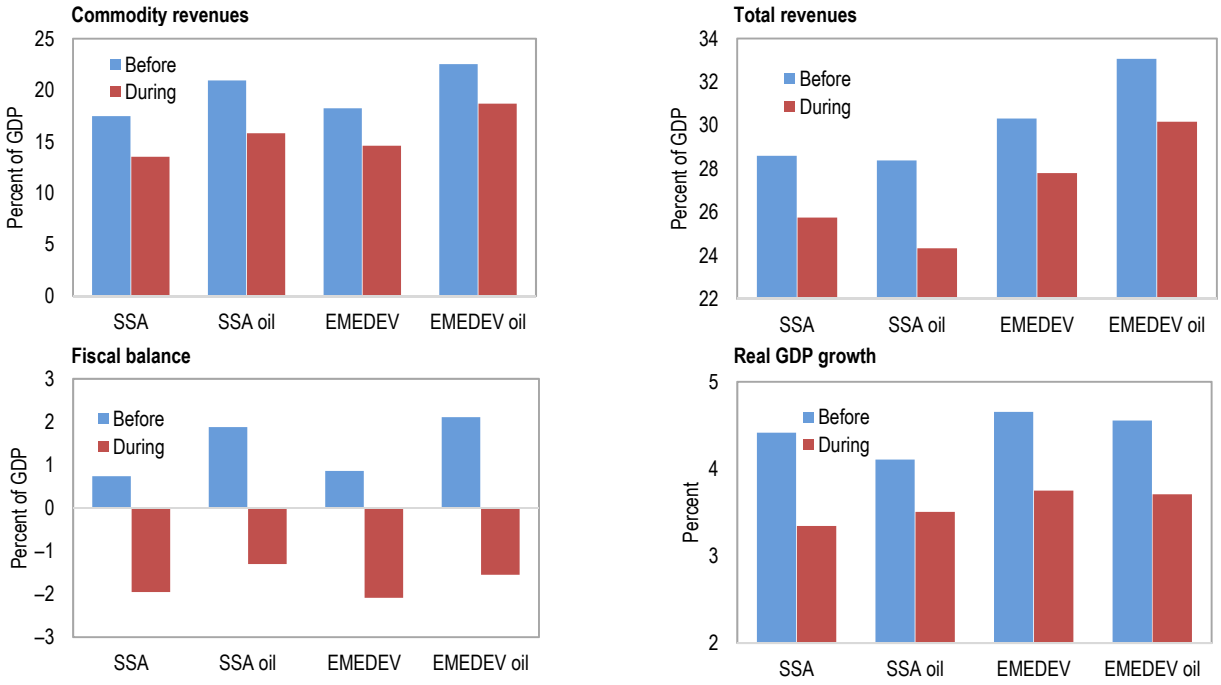
**Figure 2.1. Sub-Saharan Africa: Fiscal Balance Decomposition**




Source: IMF, World Economic Outlook database.

Note: See page 76 for country groupings table and page 78 for country abbreviations.

**Figure 2.2. Sub-Saharan Africa and Emerging Market and Developing Economies: Episodes of Commodity-Revenue Decline**




Sources: IMF, World Economic Outlook database; and IMF staff calculations.

Note: "Before" refers to the average values two years prior to the commodity-revenue decline episode, and "During" refers to the year of the commodity-revenue decline. EMEDEV = all emerging market and developing economies; SSA = sub-Saharan Africa.

for oil exporters. Also, during the most recent episode, in cases where expenditures were cumulatively cut, this was mainly carried out through cuts in capital expenditures (for example, in Burkina Faso, Chad, Republic of Congo, Gabon, and Zambia), with Angola and the Central African Republic the only notable exceptions. This comparatively stronger adjustment is due in part to the perceived permanent character of the slump in commodity prices, and to the absence of sufficient fiscal and external buffers.[2] The magnitude of adjustment in investment expenditures depends on the initial size of government investment. In particular, for the most recent episode, countries with high investment-to-GDP ratios also experienced the largest cuts in public investment expenditures.

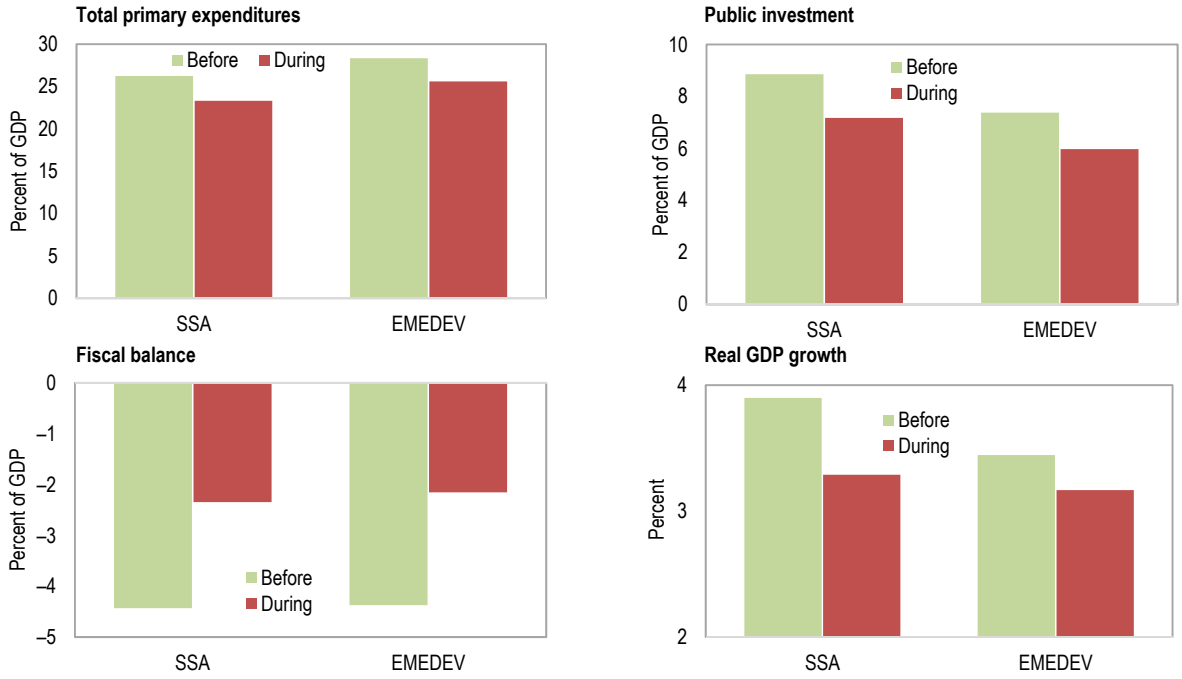
Looking more broadly at all episodes of commodity revenue declines during the period 1990–2016 in sub-Saharan Africa, we observe that, on average, commodity-related revenues declined by 4 percent of GDP and, after a partial offset from non-commodity-related revenues, total government revenues decreased by about 3 percent of GDP (Figure 2.2).[3]

Current and capital spending remained mostly unchanged, with overall fiscal balances deteriorating by about 3 percent of GDP, suggesting difficulties in adjusting to the revenue decline. Overall, the combination of the income shock from lower commodity prices, deteriorating overall balances, and possibly weaker global demand was associated with a growth deceleration of about 1 percentage point of GDP, on average. In the emerging market and developing economy sample, both the average

[2] Larger buffers and the perception that the shock was transitory during the global financial crisis called for implementing countercyclical fiscal policies in the region (Guerguil, Poplawski-Ribeiro, and Shabunina 2014).

[3] We construct the commodity-related revenue database using the Word Economic Outlook database complemented with data from country authorities, the World Commodity Exporters, and the ICTD Government Revenue Dataset. In addition, we identify episodes of commodity revenue-to-GDP declines of more than 1 percentage point—the average annual decline in commodity revenues among sub-Saharan Africa commodity exporters during 2013–16. This results in 90 episodes in sub-Saharan Africa and 252 episodes in the emerging market and developing economy sample.

**Figure 2.3. Sub-Saharan Africa and Emerging Market and Developing Economies: Spending-Based Fiscal Consolidation Episodes**




Sources: IMF, World Economic Outlook database; and IMF staff calculations.

Note: "Before" refers to the average values two years prior to the consolidation episode, and "During" refers to the year of the consolidation. EMEDEV = all emerging market and developing economies; SSA = sub-Saharan Africa.

revenue shock and the growth effect are smaller than in the case of sub-Saharan Africa, perhaps reflecting a higher degree of diversification.

The average decline in commodity-related revenues was more dramatic for oil-exporting sub-Saharan African countries (about 5 percentage points of GDP), and was associated with capital spending cuts of about 1 percent of GDP, on average. Also in this group, overall deterioration in the fiscal balance was larger, at about 3.2 percent of GDP, and GDP growth decelerated by about 0.6 of a percentage point.

## Episodes of Past Fiscal Consolidations

We now turn to the stylized facts of fiscal consolidations across the region during 1990–2016, and quantify their direct impact on economic activity.[4]

We characterize cases of fiscal consolidation as episodes of significant improvements in the countries' fiscal positions. As a baseline, we identify episodes where the cyclically adjusted primary balance improved by at least 1 percent of GDP (Annex 2.1).

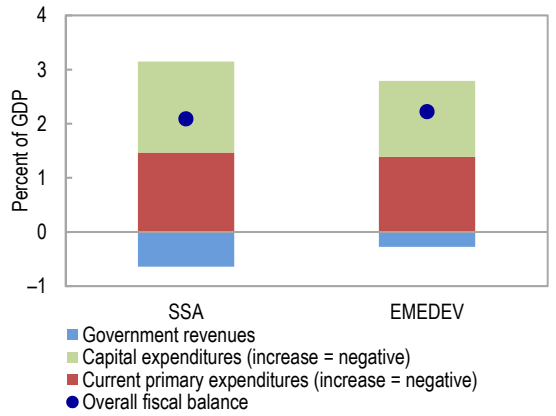
During spending-based fiscal consolidation episodes, primary expenditures were reduced by about 3 percent of GDP, on average, in both the sub-Saharan African countries and the emerging market and developing economies sample (Figure 2.3).[5]

In both samples, the overall fiscal balance during fiscal consolidation episodes improved by about 2 percentage points starting from an average overall fiscal deficit of about 4 percent of GDP. Similarly,

[4] We focus on action-based fiscal consolidations driven by spending cuts or noncommodity revenue mobilization, rather than on spending cuts associated with commodity price declines or improvements in the fiscal position associated with increases in commodity-related revenue. This is done in order to identify the effect of fiscal policy on economic activity rather than the income effect of commodity-price fluctuations.

[5] In addition to the required improvement in the cyclically adjusted fiscal position of at least 1 percent of GDP, a fiscal consolidation is classified as expenditure-based if it is associated with primary spending cuts of at least 0.5 percent of GDP. Using this approach, we identify 211 episodes in sub-Saharan Africa and 568 episodes in the emerging market and developing economy sample.

**Figure 2.4. Change in the Overall Fiscal Balance and Components: Spending-Based Fiscal Consolidation Episodes**




Sources: IMF, World Economic Outlook database; and IMF staff calculations.

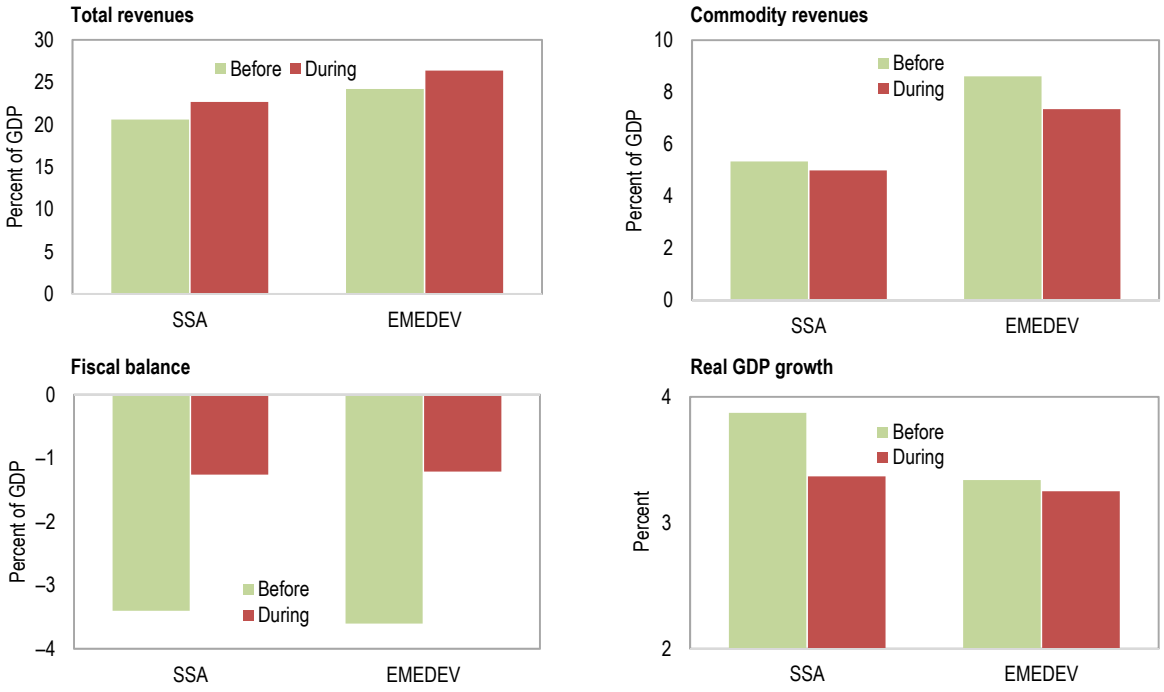
Note: EMEDEV = all emerging market and developing economies; SSA = sub-Saharan Africa.

the change in the cyclically adjusted primary balance is about 3 percent in both samples.

In terms of composition, cuts in primary expenditures were roughly evenly distributed between capital spending and current primary spending cuts (about 1.7 and 1.5 percent of GDP, respectively) for the average sub-Saharan African country (Figure 2.4). In addition, government revenues declined moderately in both samples, possibly as a result of the slowdown in economic activity.

Revenue-based fiscal consolidations not associated with commodity revenue increases were of similar magnitude as those based on spending.[6] They were also characterized by an average improvement in the fiscal position of about 2 percent of GDP and were mostly explained by improvements in government revenues, with limited cuts in primary expenditures (Figure 2.5).

**Figure 2.5. Sub-Saharan Africa versus Emerging Market and Developing Economies: Revenue-Based Fiscal Consolidation Episodes**




Sources: IMF, World Economic Outlook database; and IMF staff calculations.

Note: "Before" refers to the average values two years prior to the consolidation episode, and "During" refers to the year of the consolidation. EMEDEV = all emerging market and developing economies; SSA = sub-Saharan Africa.

[6] Revenue-based fiscal consolidations are defined as episodes when the cyclically adjusted primary balance improves by at least 1 percent of GDP together with at least 0.5 percent of GDP improvement in government revenues, and when the consolidation is not associated with an increase in commodity-related revenues. We identify 252 episodes in sub-Saharan Africa and 447 in the emerging market and developing economy sample.

Overall, past spending- and revenue-based consolidation episodes were associated with growth slowdowns. During spending-based consolidations, growth decelerated by about 0.6 and 0.3 percentage point in sub-Saharan Africa and emerging market and developing economy samples, respectively, compared with the rate of growth prior to the consolidation episode.

The growth deceleration has been milder in the case of revenue-based fiscal consolidations compared with spending-based adjustments. These results set the stage for the empirical analysis that follows.

## THE EFFECT OF FISCAL POLICY ON OUTPUT

Understanding the impact of fiscal policy on economic activity is critical for consolidation plans. Despite their importance for public policy and a large body of literature, the size of fiscal multipliers—the change in output in response to a change in fiscal policy—remains an open question and often a source of disagreement among economists.

This section investigates the effect of changes in fiscal policy—proxied by unanticipated changes in public investment, public consumption, and fiscal revenue—on output for a sample of 35 sub-Saharan African countries over the period 1990–2016. In particular, it assesses whether the relationship between fiscal policy and output depends on the nature of the fiscal adjustment, the state of the economic cycle, or the efficiency of public investment and economic management. Fiscal multipliers are estimated considering all fiscal shocks (positive or negative) and across all fiscal stances. This allows the quantification of the impact of fiscal policy across a broad set of countries in the region, including those still growing fast and where the need for fiscal consolidation might be more moderate.[7]

The approach used has two key elements. First, it uses forecast errors to identify the causal effects of unanticipated changes in public investment, consumption, and revenues on output growth (Auerbach and Gorodnichenko 2013a, 2013b; Abiad, Furceri, and Topalova 2016).[8] Second, using the local projections method (LPM) (Jordà 2005), it traces the short- and medium-term responses of output to the unanticipated changes in different fiscal variables for up to five periods ahead.[9]

### The Size of the Fiscal Multiplier

Multipliers vary depending on the policy variable. Public investment shocks have large and significant effects on economic activity (Figure 2.6).[10] An unanticipated 1 percent of GDP change in public investment changes output by about 0.1 percent in the same direction in the year of the shock and by 0.7 percent after three years. Estimated multipliers for consumption expenditures have a smaller effect on output than investment multipliers (about 0.5 percent after three years). Finally, changing government revenue does not have a statistically significant effect on output.

Consistent with other studies on developing economies, the magnitude of the estimated multipliers is less than one, with the investment expenditure multiplier being the largest in magnitude, followed by the multiplier of public consumption, and with the multiplier for revenues

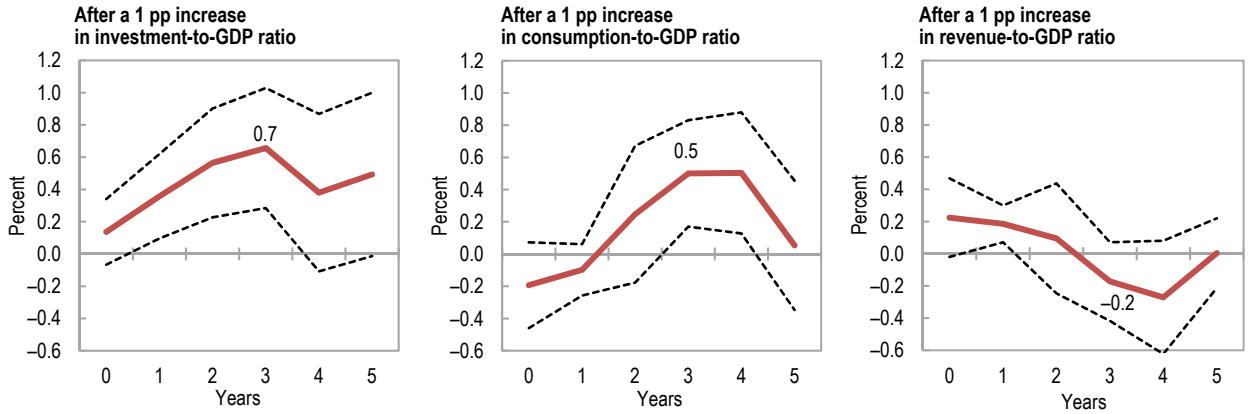
[7] Given the current context of many countries in the region, the next section estimates the effects of fiscal policy during episodes of fiscal consolidation. Conceptually, the distinction between the two sections is also important since a reduction in investment or an increase in revenues does not necessarily translate into a fiscal consolidation (given that, for instance, a cut in investment can be offset by an increase in consumption of the same amount, leaving the overall fiscal position unchanged).

[8] Forecast errors for each of the three series (public investment, consumption, revenue) are computed as the difference between the actual observed value and the *World Economic Outlook* forecast as of the third quarter of the same year (see Annex 2.1 for more details).

[9] The econometric specification includes three unanticipated fiscal policy shocks—public investment, public consumption, and government revenues—and also includes relevant macroeconomic controls such as lags of real GDP growth; lags of fiscal variables; contemporary and lagged observations of commodity price changes and real external demand (proxied by changes in commodity terms of trade and the real growth of trading partners, respectively); and lags of the monetary policy stance (proxied by real money growth and inflation). For details see Annex 2.1.

[10] Figures show the effect of an unanticipated exogenous 1 percentage point increase in the ratios of public investment, public consumption, or revenue to GDP, for the year of the shock ($t = 0$) and the cumulative effect up to five years after the shock.

**Figure 2.6. Sub-Saharan Africa: Effect of Fiscal Policy on Output**




Sources: IMF, World Economic Outlook database; and IMF staff calculations.

Note: The figures present the response in output after a percentage point increase in the ratios of investment, consumption, and government revenues to GDP. Dashed lines indicate 90 percent confidence bands. pp = percentage point.

not being statistically different from zero.[11] Overall, the estimated multipliers are within the range of those found in the literature for similar groups of countries (Table 2.1). For example, the estimated multiplier for investment expenditure is within the range reported by Ilzetski, Mendoza, and Vegh (2013) and Gonzalez-Garcia, Lemus, and Mrkaic (2013).[12]

Given the need for fiscal consolidation, what do these results imply about the composition of fiscal adjustment? First, reductions in government investment are more harmful for growth than cutting government consumption. This is because lower levels of productive investment imply lower capital accumulation, which has negative effects on potential output for subsequent periods (Dell'Erba, Koloskova, and Poplawski-Ribeiro 2014). However, crucial social spending on health, education, and social safety nets should be protected since reductions in current spending can have a larger negative effect on lower-income households, and could adversely impact longer-term development prospects. Second, given the likely small impact on output, increasing revenue mobilization is less costly than cutting expenditures. Indeed, better domestic revenue mobilization offers substantial potential to consolidate with a lower cost in terms of output growth. As discussed in Box 2.1, the average sub-Saharan African country could increase its tax-to-GDP ratio by 3½ to 5 percentage points—and the potential is larger in oil exporters, which could raise the tax-to-GDP ratio by as much as 8¼ percentage points, on average.

## Fiscal Multipliers and Country Characteristics

The impact of fiscal policy shocks has been found to depend crucially on the state of the economic cycle and country characteristics, such as periods of low and high growth, and the efficiency of public investment and economic management. This section investigates these issues in the context of sub-Saharan Africa.[13]

[11] Using tax revenue instead of overall revenues yields similar results. When considering tax revenues, the estimated effect after three years of a percentage point change in the ratios of public investment or public consumption to GDP is to change output by 0.6, and 0.4, respectively, in the same direction. These estimates, however, are based on a reduced sample due to the limited availability of tax revenue forecasts in the World Economic Outlook database. Since conclusions are similar to the baseline results in Figure 2.6, the remainder of the analysis uses total fiscal revenue to allow for a more comprehensive sample.

[12] For consumption expenditure, our estimate is broadly in line with the literature, ranging between 0.1 and 0.3 after two years into the shock. For fiscal revenue, other studies generally report a slightly positive but insignificant multiplier.

[13] The literature on fiscal multipliers has also discussed the degree of exchange rate flexibility, the level of debt, and the degree of openness of the economy (Ilzetzki, Mendoza, and Vegh 2013; Batini and others 2014; Mineshima, Poplawski-Ribeiro, and Weber 2014). We expand on this discussion in the next section. In addition, multipliers are likely to be different in the case of oil-exporting countries, given that fiscal policy mainly affects the non-oil economy. Due to small sample data limitations, it is difficult to focus only on oil exporters.

**Table 2.1. Selected Groups: Estimated Fiscal Multipliers in the Literature**

| Source | Group | Variable | 1 Year | 2 Years | 3 Years |
|---|---|---|---|---|---|
| Abiad, Furceri, and Topalova 2016 | Advanced Economies | Investment | **0.8** | **1.0** | **1.5** |
| Blanchard and Leigh 2013 | Europe | Structural fiscal balance | **1.1** | … | ... |
| Gonzalez-Garcia, Lemus, and Mrkaic 2013 | Developing economies | Investment | **0.4** | **0.6** | ... |
| | | Consumption | **0.4** | **0.3** | ... |
| | | Taxes | –0.1 | 0.5 | ... |
| Ilzetzki, Mendoza, and Vegh 2013 | High-income countries | Consumption | **0.4** | **0.5** | **0.6** |
| | | Investment | **0.9** | 1.2 | 1.3 |
| | Developing economies | Consumption | 0.2 | –0.1 | –0.4 |
| | | Investment | **1.5** | **1.6** | **1.6** |
| Kraay 2012 | Aid-dependent economies | Spending | **0.5** | ... | ... |
| Ilzetzki 2011 | High-income countries | Spending | **0.9** | **1.0** | **1.1** |
| | | Taxes | –0.1 | –0.1 | –0.2 |
| | Developing economies | Spending | **0.4** | **0.3** | 0.2 |
| | | Taxes | **–0.4** | –0.6 | –0.8 |
| IMF 2008 | Advanced economies | Spending | ... | ... | **0.5** |
| | | Revenue | ... | ... | **–0.4** |
| | Emerging economies | Spending | ... | ... | **–0.2** |
| | | Revenue | ... | ... | **–0.2** |

Source: Authors' calculations.

Note: The figures show the effects of increases in spending and public revenue, thus expected signs are positive and negative, respectively. Boldface type denotes significance at least at the 0.10 level.

## Business Cycles

In general, fiscal multipliers tend to be larger in downturns than in expansions. In an environment of low growth and economic slack, an increase in public spending can potentially have a larger impact on economic activity than it would in a context of high rates of growth. This is because, at full capacity or in a period of high growth, an increase in public demand is more likely to crowd out private demand and leave output unchanged. On the other hand, during periods of low growth or economic slack, there is more room for the fiscal impulse to translate into an expansion of aggregate demand and output.

Indeed, a downturn has a different effect on multipliers than an upturn in sub-Saharan African countries. During periods of low growth, public spending multipliers tend to be larger than during periods of high growth, while the revenue multiplier shows a smaller magnitude during periods of low growth (Figure 2.7).[14]

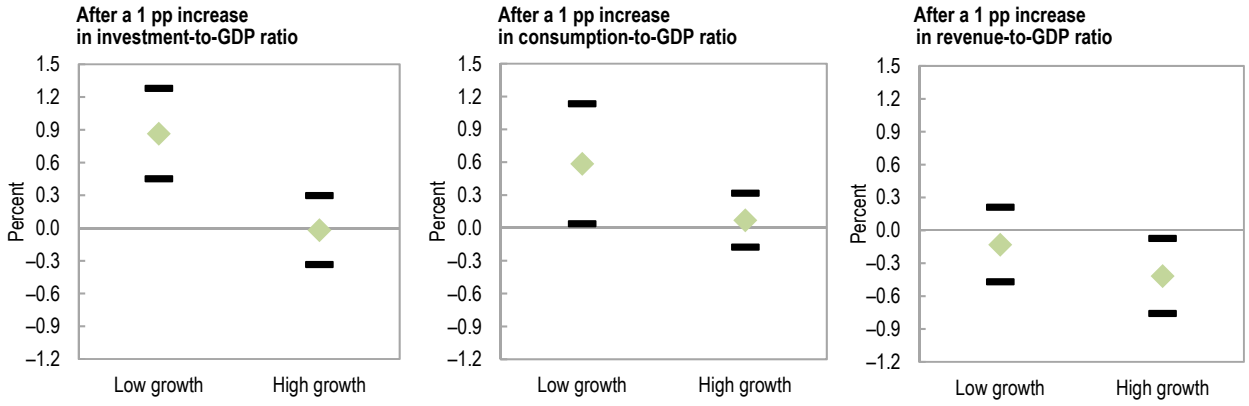
## Efficiency of Public Investment and Economic Management

Inefficiencies in public expenditure management and revenue administration tend to decrease multipliers because they limit the impact of fiscal policy on output. Such inefficiencies may capture weaknesses in governance, public investment management in general, and project selection, implementation, and monitoring—all of which result in a dollar's worth of investment expenditures yielding less than a dollar of effective public capital. Since in a low-efficiency environment only a fraction of public investment spending translates into productive capital stock and infrastructure, increased public investment leads to more limited output gains (see Chapter 2 of the October 2014 *World Economic Outlook*).

We proxy inefficiencies and quality of economic management using a composite indicator that combines three aspects of the quality of government from the *International Country Risk Guide* (ICRG), namely the quality of bureaucracy, control of corruption, and the tradition of law and order. Indeed, sub-Saharan African countries with lower governance quality tend to show smaller multipliers of both public spending and revenue (Figure 2.8). The results suggest that public spending tends to be relatively less productive when the quality of governance is low, a circumstance that may favor rent seeking over efficient spending (Keefer and Knack 2007).

[14] For low and high growth, and worse or better institutional quality, the measures refer to the standardized distance between the indicator and the sample mean. The efficiency of public investment refers to a time-varying score between 0 and 1. In all cases, the variables enter the estimated equation using a smooth transition function, as in Auerbach and Gorodnichenko 2013a.

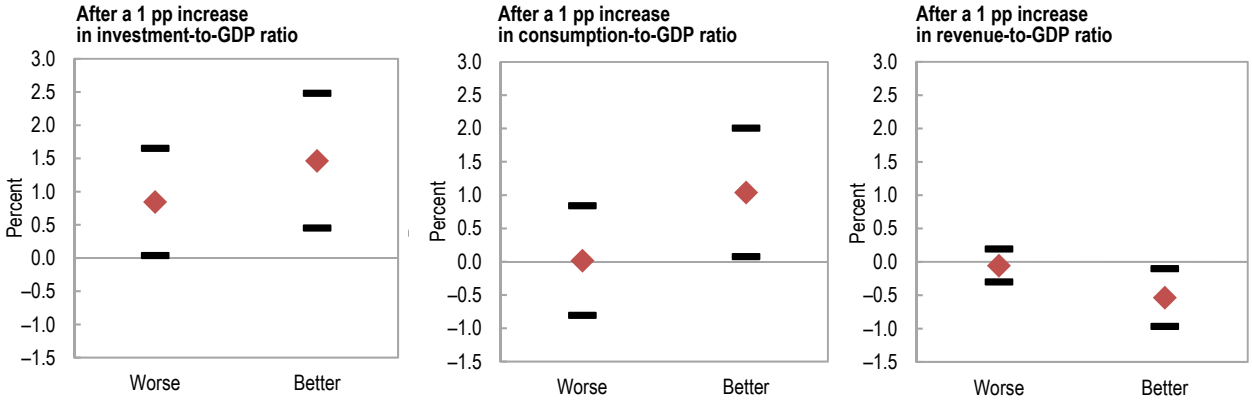
**Figure 2.7. Sub-Saharan Africa: Fiscal Multipliers during Periods of High and Low Growth**




Sources: IMF, World Economic Outlook database; and IMF staff calculations.

Note: The figures present the response in output after a percentage point increase in the ratios of investment, consumption, and government revenues to GDP. Bars indicate 90 percent confidence bands. pp = percentage point.

**Figure 2.8. Sub-Saharan Africa: Fiscal Multipliers during Periods of High and Low Governance Quality**




Sources: PRS Group, International Country Risk Guide database; and IMF staff calculations.

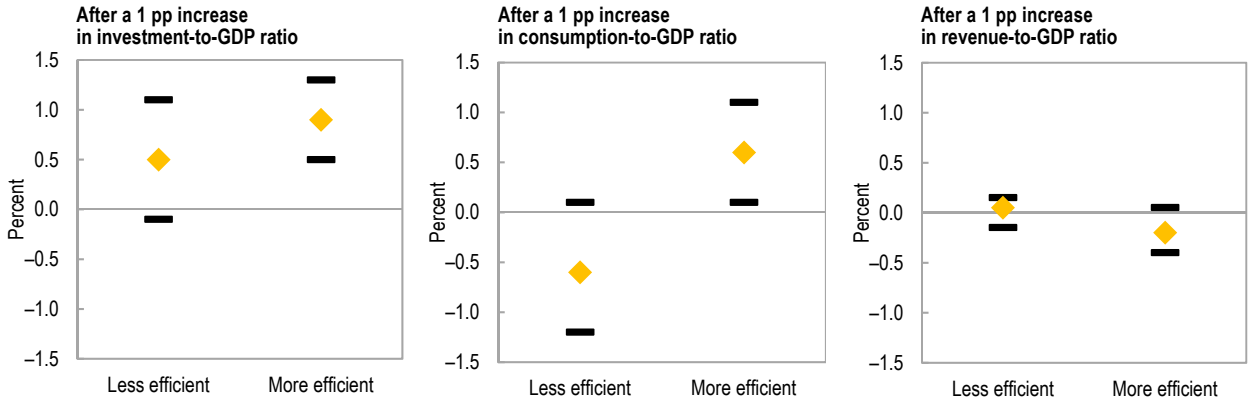
Note: The figures present the response in output after a percentage point increase in the ratios of investment, consumption, and government revenues to GDP. Bars indicate 90 percent confidence bands. pp = percentage point.

In addition, we proxy inefficiencies in public spending and quality of economic management using a hybrid indicator that combines physical and survey-based indicators into a synthetic index of the coverage and quality of infrastructure networks (IMF 2015). We find that multipliers of both public investment and consumption expenditure are significantly larger in countries where public investment is most efficient, and lower in countries with low efficiency of public investment (Figure 2.9). The multiplier of fiscal revenue is estimated to be larger when the efficiency of public investment is larger, but the results are not statistically significant.

## FISCAL CONSOLIDATIONS, ECONOMIC ACTIVITY, AND MITIGATION POLICIES

This section focuses squarely on the effects of fiscal consolidation on economic activity and the policies that can lessen their potentially contractionary effects. These include policies related to the composition of consolidations as well as accompanying policies such as those affecting monetary conditions, the degree of exchange rate flexibility, the level of indebtedness, the size of external buffers, and the degree of trade integration.

**Figure 2.9. Sub-Saharan Africa: Fiscal Multipliers during Periods of High and Low Efficiency of Public Investment**




Sources: IMF, Fiscal Affairs Department, Public Investment Efficiency Indicator database; and IMF staff calculations.

Note: The figures present the response in output after a percentage point increase in the ratios of investment, consumption, and government revenues to GDP. Bars indicate 90 percent confidence bands. pp = percentage point.

## Identifying Episodes of Fiscal Consolidations

As described in IMF 2010a, it is important to consider "action-based" fiscal consolidations—that is, improvements in the fiscal position resulting from a reduction in public expenditures or increases in revenue mobilization—that are not explained by a surge in commodity revenues or a reflection of increases in government revenues associated with improvements in the business cycle. We follow the literature by identifying the size of the fiscal consolidation based on the cyclically adjusted primary balance, excluding episodes that are associated with improvements in commodity revenues. In addition, we distinguish fiscal consolidations between: (1) those driven by government spending cuts and not associated with improvements in commodity revenues; and (2) revenue-based consolidations not associated with improvements in commodity revenues.[15]

The analysis estimates the direct effect of fiscal consolidations on economic activity using the LPM and following Dell'Erba, Koloskova, and Poplawski-Ribeiro (2014), and Devries and others (2011).

We identify the average effect of the policy intervention relative to a baseline on output growth and estimate the expected impact of the policy intervention after controlling for domestic and external economic conditions.[16]

## How Much Does Fiscal Consolidation Hurt?

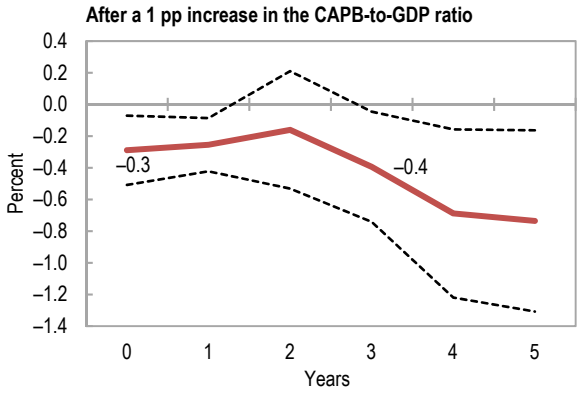
Focusing first on episodes of fiscal consolidation associated with spending cuts and not related to an improvement in commodity revenues, we find that fiscal consolidations have contractionary effects on economic activity. A 1 percentage point adjustment in the ratio of the cyclically adjusted primary balance to GDP reduces output by about 0.3 percent on impact and by 0.4 percent after three years (Figure 2.10).[17]

[15] In all cases, the improvement of the cyclically adjusted primary balance needs to be higher than 1 percent of GDP (see IMF 2010a; Dell'Erba, Koloskova, and Poplawski-Ribeiro 2014). In addition, consolidations are classified as expenditure based if spending falls by at least 0.5 percent of GDP and as revenue based if government revenues increase by at least 0.5 percent of GDP. Also, in all cases, commodity-related revenues cannot increase by more than 1 percent of GDP. See Annex 2.1.

[16] Given the limited intraregional integration in sub-Saharan Africa, the spillovers from fiscal consolidations are expected to be low; see, for instance, Chapter 1 of the April 2016 *Regional Economic Outlook: Sub-Saharan Africa*. For a discussion on regional spillovers in the context of fiscal consolidations in the euro area see Dabla-Norris, Dallari, and Poghosyan, forthcoming.

[17] These results are robust to alternative definitions of fiscal consolidation episodes, including when spending-based consolidations are required to have a larger component of spending cuts than revenue increases. Analyzing "large" fiscal consolidations (defined as an improvement in the cyclically adjusted primary balance larger than 1.5 percent of GDP, as in IMF 2010a), we also find similar results, although the contractionary effects on output seem to be slightly larger. Finally, identifying fiscal consolidations that are "sustained" over time (defined as fiscal consolidations where the three-year cumulative change in the cyclically adjusted primary balance was larger than 2.5 percent of GDP), we observe stronger contractionary effects on economic activity.

**Figure 2.10. Sub-Saharan Africa: Impact of Spending-Based Fiscal Consolidation on Economic Activity**




Sources: IMF, World Economic Outlook database; and IMF staff calculations.

Note: The figure presents the response in output after a 1 percentage point to GDP improvement in the cyclically adjusted primary balance (CAPB), following a spending-based consolidation. Dashed lines indicate 90 percent confidence bands. pp = percentage point.

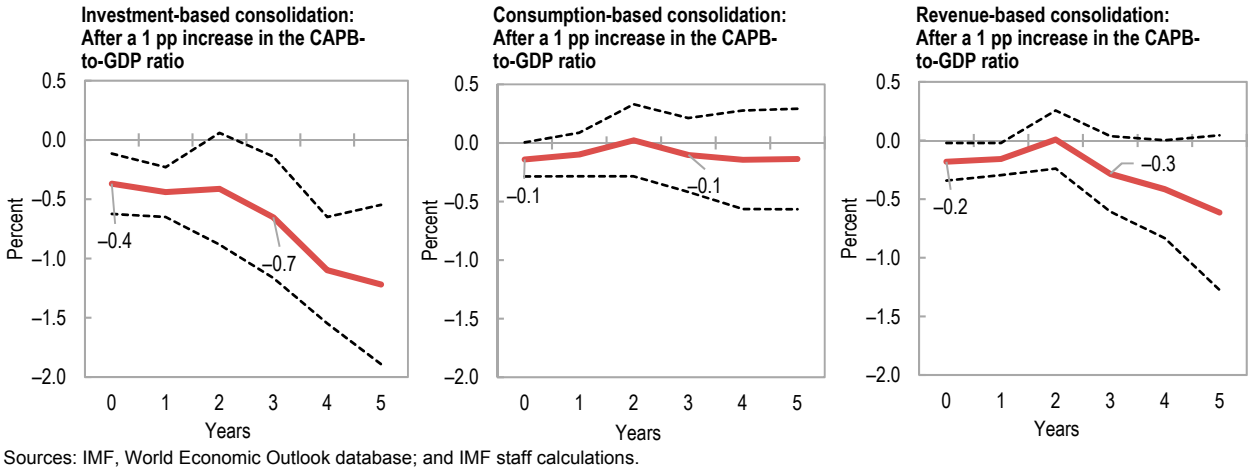
Differentiating fiscal consolidations depending on whether they are mostly driven by a reduction in public investment, a reduction in current expenditures, or an increase in revenues, the analysis finds that the impact on output depends on the composition of fiscal consolidation. Consolidations driven by reductions in public investment are the least growth friendly: a 1 percentage point of GDP adjustment in the fiscal position during these episodes reduces output by about 0.4 percent on impact, and by close to 0.7 percent after three years (Figure 2.11). As discussed earlier, this result may be explained by the fact that lower investment affects potential output and through this channel has a longer-lasting impact on output (Dell'Erba, Koloskova, and Poplawski-Ribeiro 2014).

Considering fiscal consolidations driven by cuts in current expenditures, we find small and insignificant effects on output. This suggests that cutting potentially wasteful components of spending and streamlining expenditures (such as eliminating fuel subsidies, which tend to be regressive (Box 2.2) may achieve fiscal consolidation and at the same time have only mild or negligible effects on economic activity. Importantly, assessments of the distributional effect of the composition of fiscal consolidation (see for instance, Ball and others 2013 and Woo and others 2013) underscore the need to protect crucial social spending on health, education, and social safety nets (Box 2.3).

Finally, fiscal consolidations driven by increases in revenue mobilization (and not associated with higher commodity-related revenues) have negative effects on growth, but these are of a smaller magnitude than investment-based fiscal consolidations. A 1 percent of GDP improvement in the fiscal position during these episodes reduces output by about 0.2 percent on impact and by 0.3 percent after three years (although not statistically different from zero) compared with 0.4 and 0.7, respectively, when fiscal consolidations are investment based.

In the case of sub-Saharan Africa, the relatively low tax ratios and the untapped potential for revenue mobilization may be a possible explanation for

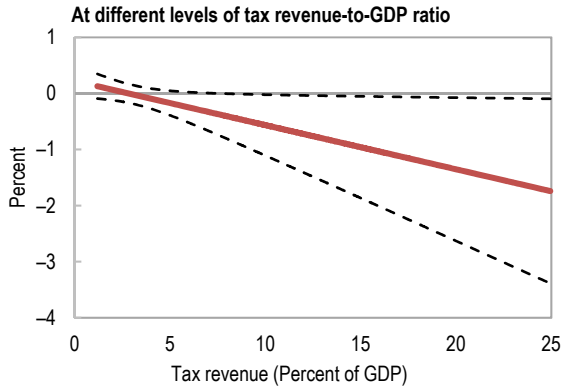
**Figure 2.11. Sub-Saharan Africa: Impact of Investment, Consumption, and Revenue-Based Consolidations on Output**




Sources: IMF, World Economic Outlook database; and IMF staff calculations.

Note: The figures present the response in output after a 1 percent of GDP improvement in the cyclically adjusted primary balance (CAPB), following an investment, consumption, or revenue-based consolidation. Dashed lines indicate 90 percent confidence bands. pp = percentage point.

**Figure 2.12: Sub-Saharan Africa: Impact of Tax-Based Consolidation on Economic Activity**




Sources: IMF, World Economic Outlook database; and IMF staff calculations.

Note: The figure presents the marginal effect on output for different levels of the tax-revenue-to-GDP ratio following a tax-based fiscal consolidation. Dashed lines indicate 90 percent confidence bands.

revenue-based measures being less contractionary than investment-based consolidations (see Gaspar, Jaramillo, and Wingender 2016 for a similar argument).[18] Indeed, the estimated impact of tax-based consolidations for different levels of tax-to-GDP ratios is smaller in countries with low levels of tax revenue mobilization (Figure 2.12).

## The Role of Policies and Macroeconomic Factors

Can policies or macroeconomic fundamentals play a mitigating role when fiscal consolidation is needed? These policies may include the monetary stance, the urgency for the fiscal consolidation, and other elements associated with the external sector such as the degree of exchange rate flexibility, the size of external buffers, and the degree of trade openness.[19]

### Monetary Policy Stance

A more accommodating monetary policy stance, proxied by the rate of growth of broad money and credit to the private sector—or more broadly, less tight liquidity conditions—helps lessen the contractionary effects of fiscal consolidation on growth (Figure 2.13). We also find preliminary evidence that in countries experiencing higher inflation levels, fiscal consolidation may be less harmful for growth, although these results are not always statistically significant. A plausible channel is that fiscal consolidation reduces aggregate demand, contributing to a reduction in inflation, which in itself is favorable for growth. In addition, if consolidation contributes to reducing inflation, it also contributes to strengthening the credibility of the economic policy package that also supports growth.

### Different Debt Environments

The contractionary effects of fiscal consolidation are smaller in the case of countries with higher debt (Figure 2.14). As in the case of high inflation, fiscal consolidation can favor the reduction of high debt levels, as well as have positive credibility and confidence effects and contribute to reducing the burden of debt service in the future, which in turn allows for freeing resources for productive and growth-friendly investments.

### External Sector

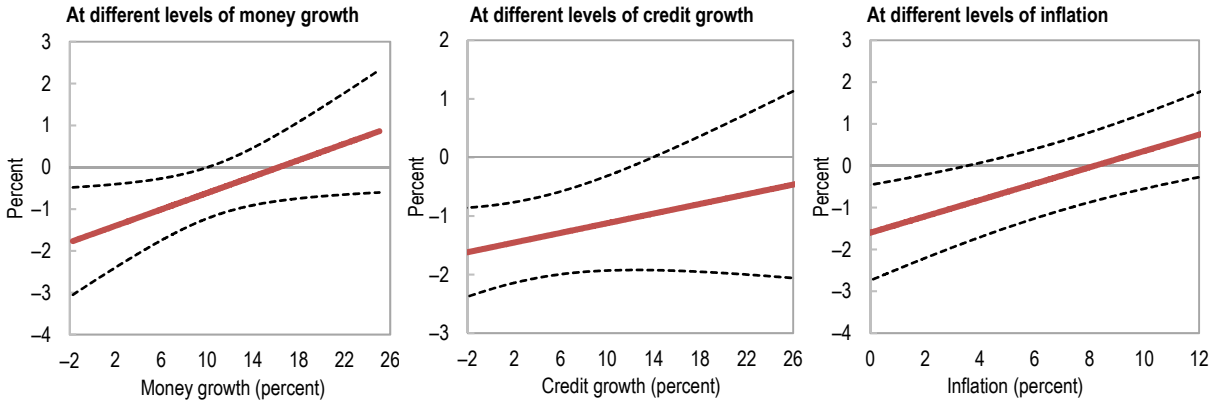
Consistent with the literature on fiscal multipliers (for example, Ilzetzki, Mendoza, and Vegh 2013), we find preliminary evidence that more exchange rate flexibility can lessen the negative impact of fiscal consolidation on economic activity, although the results are not statistically significant (Figure 2.15). The main channel of transmission is that in a more flexible exchange rate regime, monetary policy is less constrained by fiscal policy, and in the context of a fiscal consolidation it does not need to contract the monetary policy stance, as would be the case under a more rigid exchange rate arrangement.

The analysis also finds evidence that countries with more robust external buffers—measured as the level of international reserves as a percentage of GDP—seem to face a smaller impact of fiscal consolidation on growth. A possible explanation is that, all else being equal, these countries may have greater leeway to implement the fiscal adjustment than a country with exhausted external buffers. Finally,

[18] For a sample of 15 advanced economies, which tend to have larger tax ratios, IMF 2010a finds that tax-based consolidations are more contractionary than spending-based adjustments. Similarly, for a sample of advanced economies, and using a nonlinear estimation, Dell'Erba, Koloskova, and Poplawski-Ribeiro (2014) find that over the medium term expenditure-based fiscal consolidations are less contractionary than revenue-based consolidations during normal periods of economic growth and not statistically different from each other in the case of prolonged recessions.

[19] To address this point, we augment the baseline specification with an interaction term between the fiscal policy variable and the other accompanying policies and calculate the marginal effect of fiscal consolidation on economic activity for different levels of the policy variables (see Annex 2.1).

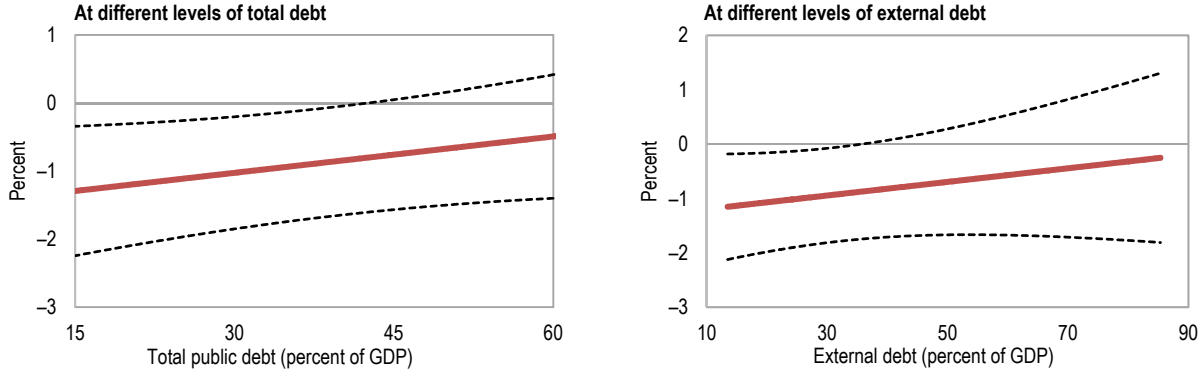
**Figure 2.13. Sub-Saharan Africa: Impact of Fiscal Consolidations under Different Monetary Conditions**




Sources: IMF, International Financial Statistics database; and IMF staff calculations.

Note: The figures present the marginal effect on output for different levels of money growth, credit growth, and inflation following a spending-based fiscal consolidation. Dashed lines indicate 90 percent confidence bands.

**Figure 2.14. Sub-Saharan Africa: Impact of Fiscal Consolidations in Different Debt Environments**




Sources: IMF, World Economic Outlook database; and IMF staff calculations.

Note: The figures present the marginal effect on output for different levels of total and external debt following a spending-based fiscal consolidation. Dashed lines indicate 90 percent confidence bands.

consistent with the fiscal multiplier literature, we find preliminary evidence that growth in more open economies suffers less during fiscal consolidations than in more closed economies. A possible channel is that external demand plays a larger role in overall economic activity in more open economies and is less dependent on the role of public demand.

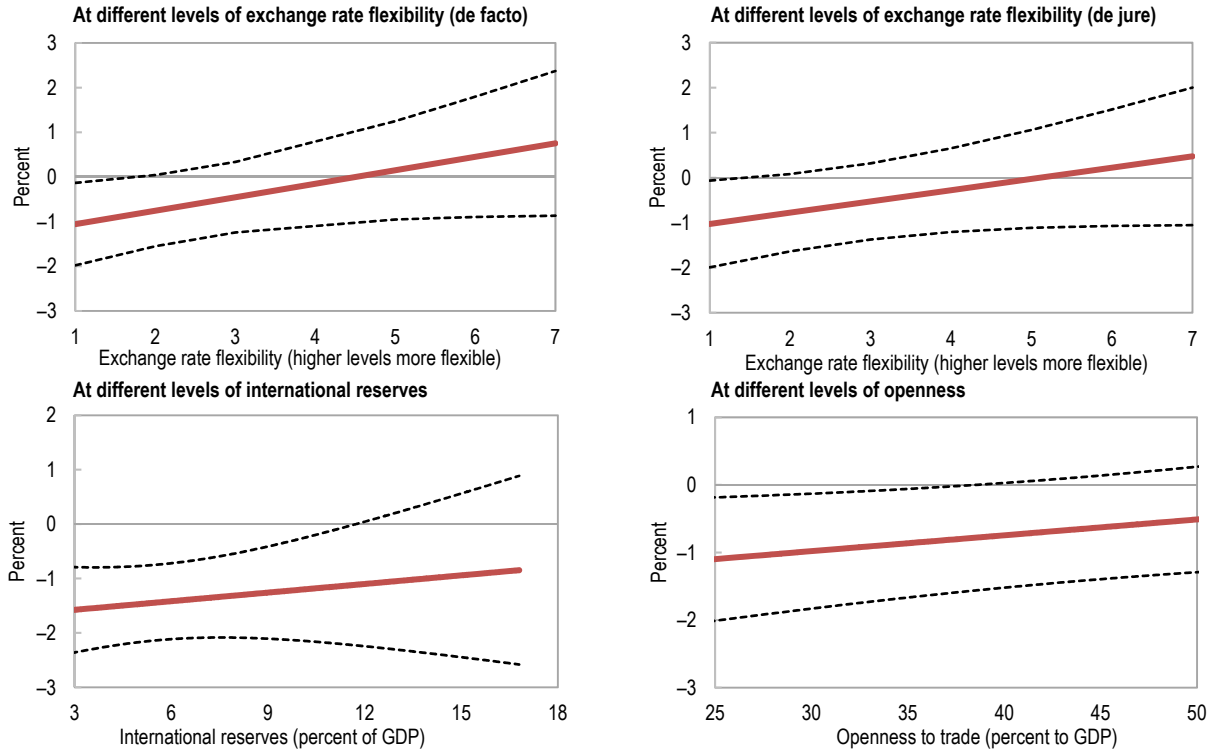
## POLICY CONSIDERATIONS AND CONCLUSIONS

The analysis in this chapter suggests that fiscal consolidations in sub-Saharan African countries typically have a contractionary effect on output. The composition of fiscal consolidation also matters: cutting capital expenditures is much costlier in terms of output than cutting current expenditures or raising revenue. During episodes of investment-based fiscal consolidation, a 1 percentage point of GDP improvement in the fiscal position lowers output by 0.4 percent in the first year of consolidation, and by about 0.7 percent three years later. In contrast, during fiscal consolidations based on current expenditures and revenue, a 1 percentage point of GDP improvement in the fiscal position lowers output on impact by 0.1 and 0.2 percent, respectively.

This suggests that countries in the region facing an urgent need to consolidate will have to implement policies that are likely to weigh negatively on economic activity.[20] At the same time, they face

[20] Some related literature discusses a trade-off between consolidation and growth, in effect slowing the accumulation of debt to control its possible negative effect on growth, on the one hand, and the risk that consolidation may slow down growth, on the other. For example, DeLong and Summers 2012 suggest that fiscal consolidation and austerity may be self-defeating if they cause short-term reductions in growth to become permanent through negative hysteresis effects on trend output.

**Figure 2.15. Sub-Saharan Africa: Impact of Fiscal Consolidations and Role of Exchange Rate Flexibility, International Reserves Buffers, and Openness to Trade**




Sources: IMF, World Economic Outlook database; Penn World Table 9.0; and IMF staff calculations.
Note: The figures present the marginal effect on output for different levels of exchange rate flexibility, international reserves, and openness following a spending-based fiscal consolidation. Dashed lines indicate 90 percent confidence bands. In the case of the exchange rate flexibility measures, higher values mean more flexibility according to the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER) database.

difficult choices about the timing and speed of consolidation and what instruments to use. What can be done to mitigate the negative impact of consolidation on growth? Can fiscal positions be improved while finding a way to exert a more limited effect of consolidation on output? Our analysis suggests the following in response:

- Since increasing revenue is less costly in terms of output, consolidation through revenue mobilization is preferable to cutting expenditures, especially public investment. Furthermore, increasing revenue through domestic revenue mobilization can yield substantial returns by allowing the region's social and infrastructure gaps to be addressed (see the October 2014 *Regional Economic Outlook: Sub-Saharan Africa*). Since tax collection in the region is generally low, increasing revenue mobilization can be growth enhancing (Gaspar, Jaramillo, and Wingender 2016). Indeed, there is scope to further boost public revenues through the expansion of tax bases and the modernization of outdated tax structures, and by increasing tax rates. Estimates for the region suggest a large untapped revenue potential: on average, sub-Saharan African countries could increase their tax-to-GDP ratio between 3.5 and 5 percentage points (Box 2.1). Nonetheless, increases in revenue mobilization may be difficult to implement quickly, creating a need to adjust spending in the short term.

- Cutting current expenditure is preferable to cutting investment, but composition matters. Options include streamlining expenditures by containing the wage bill in oversized public sectors, and eliminating highly regressive and poorly targeted fuel subsidies in favor of targeted social spending (Boxes 2.2 and 2.3). Current spending cuts are likely to have social costs and hence need to be designed in conjunction with social protection schemes and the preservation of crucial social spending on health

and education. Cutting capital expenditures, which arguably tends to encounter the least resistance, should be the last option and limited to items that have a limited impact on domestic activity (for example, those with a large import component) and long-term economic growth, or in cases where the scaling up of investment has taken place and consolidation is urgent. In addition, capital expenditures could be streamlined following a quality-based prioritization of projects, as fiscal multipliers are smaller where spending efficiency is low.

- Complementary policies can play an important mitigating role in fiscal consolidation. A more accommodative monetary policy, while keeping inflation in check, can lessen the contractionary effects of fiscal consolidation by offsetting some of the negative demand effects. In addition, greater exchange rate flexibility, wherever possible, and greater openness to trade may play a mitigating role. Building external buffers in the form of international reserves and creating fiscal space through the establishment of credible medium-term fiscal frameworks and fiscal rules can go a long way in preventing the need for abrupt fiscal consolidations in the future.

The discussion above suggests that there are ways to mitigate the effects of consolidation, but the overall strategy and challenges may differ between countries in the region:

- Commodity exporters are still adjusting to the new environment of low commodity prices and the resulting reduced export proceeds and budgetary revenues, in particular in oil exporters. With limited remaining buffers, fiscal consolidation is urgent. A fiscal adjustment will be needed especially for those countries facing large financing gaps, limited access to markets, or rapidly rising debt. To minimize the impact on economic activity, priority should be given to measures that have low multipliers. These may include postponing new spending initiatives, cutting low-quality projects and expenditures linked to imports, implementing public expenditure reviews, and containing the wage bill (IMF 2010a). As real public wages tend to be high in some resource-rich countries, containing or reducing them could also be helpful for competitiveness and growth, especially if the private sector wage-setting process uses the public sector as a reference (IMF 2016a). Similarly, in resource-rich countries where the investment-to-GDP ratio substantially increased during the boom years, a reduction in capital expenditures may be warranted. On the revenue side, improving noncommodity revenues (which are generally low) reduces reliance on commodity-related revenue and overall has a lower fiscal multiplier than expenditures. In parallel, countries need to strengthen medium-term fiscal frameworks, based on conservative commodity-price assumptions (IMF 2016a), and sustain economic diversification efforts (Chapter 3).

- Non-resource-intensive countries are dealing with elevated fiscal deficits as governments address social and infrastructure gaps. Despite robust growth, vulnerabilities are emerging with public debt on the rise. These countries would benefit from some degree of fiscal consolidation to avoid building further vulnerabilities, but they can consolidate at a slower pace and focus on a smoother adjustment process. In the context of a more measured consolidation effort, it is important to ensure that increases in expenditures, which have led to rapidly rising debt levels, are curbed, consistent with medium-term fiscal and external sustainability. As in the case of commodity exporters, greater focus on domestic revenue mobilization is required given the large untapped potential for greater revenue collection.

- In all countries in the region, the adjustment should be accompanied by efforts to improve the business environment, enhance the quality of institutions and governance, support domestic competition, and put in place fiscal reforms to promote growth (IMF 2016b).

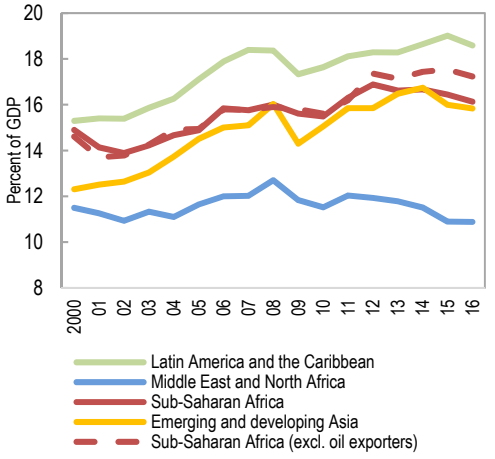
## Box 2.1. Sub-Saharan Africa's Revenue Potential

*Research presented in this box finds that the average sub-Saharan African country could increase its tax-to-GDP ratio by 3½ to 5 percentage points. The potential varies from 3¼ percentage points in resource-intensive countries to 3¾ in non-resource-intensive ones and 8¼ percentage points in oil exporters. The potential revenue that could be collected from taxes on goods and services—which already constitutes a significant share of taxes in many countries—is large.*

Over the past 15 years, tax revenues have been on an increasing trend in sub-Saharan Africa, rising from an average of less than 15 percent of GDP in 2000 to a peak of 17½ percent of GDP in 2012 (Figure 2.1.1).

However, tax revenue trends have varied during these years. Since the drop in commodity prices, oil exporters, in particular, have seen tax revenues decline sharply (Angola, Chad, Nigeria), while revenue losses in other commodity exporters have been more moderate (Central African Republic, Sierra Leone, Zambia) and often related to taxes on international trade (Figure 2.1.2, panel 1). Conversely, many non-resource-intensive countries have seen their tax-to-revenue ratios increase, mainly through a rise in the tax ratio on goods and services, which constitutes a significant share of tax revenues in the region's oil importers (Figure 2.1.2, panel 2).

**Figure 2.1.1. Selected Groups: Tax Revenue, 2000–16**



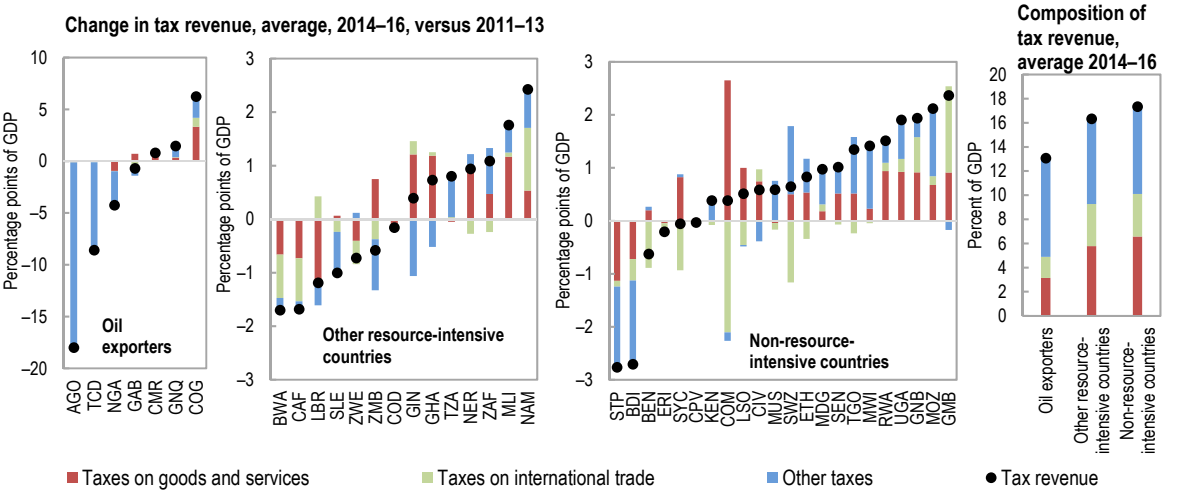

Source: IMF, World Economic Outlook database.

### Quantifying the Potential

These trends reopen the question of the region's tax revenue potential. To determine this potential, this box builds on the work in the October 2015 *Regional Economic Outlook: Sub-Saharan Africa*. Those and related studies use cross-country observations to estimate a global "tax frontier"—the upper level of the tax-revenue-to-GDP ratio to which a country can raise its taxes given its economic and institutional development. The distance to that tax frontier for each country reflects in part tax policy preferences—countries closer to the tax frontier would tend to accept higher tax burdens to finance the delivery of public services—but it also depends on tax administration.

With preferences and underlying fundamentals to estimate such a frontier being dynamic and potentially impacting certain types of taxes differently, the following estimation

**Figure 2.1.2. Sub-Saharan Africa: Composition of Tax Revenue**




Source: IMF, World Economic Outlook database.

Note: See page 76 for country groupings table and page 78 for country abbreviations.

**Box 2.1** *(continued)*

**Table 2.1.1. Tax Frontier Estimation**

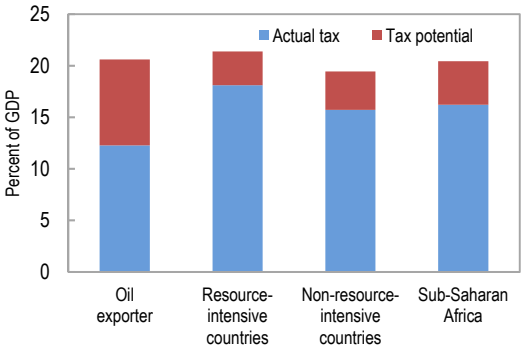
| | Tax | Goods and Services |
|---|---|---|
| | Global | Global |
| Log real GDP per capita (lag) | 2.797 *** | 2.019 *** |
| Trade openness | 0.101 *** | 0.002 *** |
| Value added of agriculture | 0.000 | 0.000 |
| Gini coefficient (WDI) | –0.006 *** | –0.008 *** |
| General government dummy | 0.113 ** | 0.126 |
| Public expenditure on education | 0.018 *** | 0.007 |
| Oil exporter dummy | 0.160 ** | –0.630 *** |
| Log real GDP per capita squared (lag) | –0.144 *** | –0.102 *** |
| Constant | 4.769 *** | –0.464 |
| sigma_u | 0.54 *** | 0.66 *** |
| sigma_v | 0.10 *** | 0.16 *** |
| Number of observations | 1,451 | 1,211 |
| Number of countries | 123 | 107 |

Source: IMF staff estimates.

Note: WDI = World Development Indicators.

*, **, and *** indicate statistical significance at the 10, 5, and 1 percent levels.

**Figure 2.1.3. Sub-Saharan Africa, Full Sample: Tax Ratio and Potential, Average**




Source: IMF staff estimates.

Note: See page 76 for country groupings table.

extends previous analyses to cover the years into the commodity price shock, a larger set of sub-Saharan African countries, and specific tax measures.

Regressions of the tax-to-GDP ratio on a range of country-specific factors in a panel of 124 countries from 2000 to 2015 yield the following results:[1]

- More trade openness, lower levels of income inequality, oil exporter status, and higher education spending are strongly associated with higher tax-to-GDP ratios. Higher lagged income per capita is also related to a higher tax ratio but the effect diminishes at higher levels of development (Table 2.1.1, column 1).[2]
- These estimates allow for determining an implied tax ratio based on each country's fundamentals that, when compared with the actual tax ratio, yields the country's tax potential. For the average sub-Saharan African country, this ratio could be as large as 3½ to 5 percent of GDP, but there are large variations across regional groups (Figure 2.1.3).[3] In particular, the average oil exporter shows a potential of 8¼ percent of GDP, compared with 3¼ percent for the average resource-intensive country and 3¾ percent for the average non-resource-intensive country.
- Given that taxes on goods and services provide a substantial share of revenues in many countries, it is interesting to look into the potential for this particular type of tax. The results based on Table 2.1.1 (column 2) reveal that the potential additional revenue from these taxes may be substantial—at 2½ percent of GDP for the region on average, 2¾ percent points for oil exporters, 3¼ percent for other resource-intensive countries, and about 2 percent for non-resource-intensive countries. These results imply possible further gains from value-added and excise taxes.

[1] Regressors include the log of GDP per capita and its square (to measure a possible nonlinear effect of development on tax collection capacity); trade openness, measured by the sum of exports and imports in percent of GDP (to proxy potential to tax foreign transactions); the size of the agricultural sector in percent of GDP (to proxy informality); the Gini coefficient (to proxy the preference for redistribution); a dummy to capture general versus central government revenue (measured tax base); public spending on education in percent of GDP (to proxy preference for public service provision); and an oil-exporter dummy.

[2] The estimation follows Mundlak's (1978) random effects model, which allows for identifying inefficiency from unobserved heterogeneity across countries (correlation of the random effect with the explanatory variables). The estimation produces a time-invariant tax effort for each country's ratio of actual to estimated tax revenue in percent of GDP over the estimation period.

[3] The range reflects different samples used to determine the tax potential, with 3½ percent of GDP being the lower bound for an estimation using a sub-Saharan African sample, and 4¼ percent using estimates from a global or emerging market and developing economy sample.

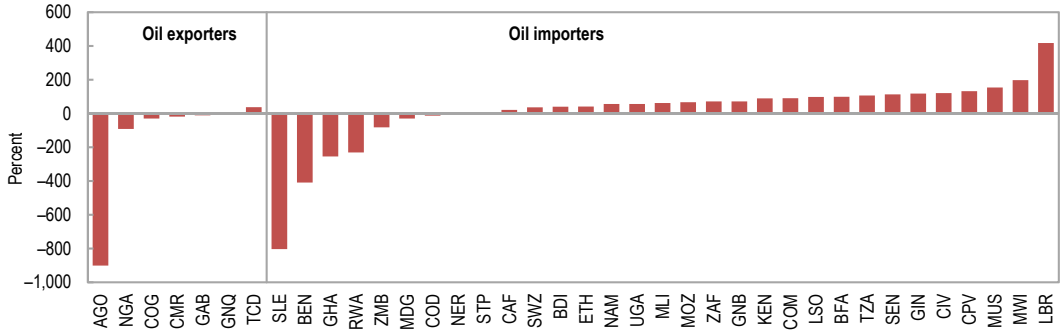
## Box 2.2. Eliminating Fuel and Energy Subsidies

*Eliminating regressive fuel and energy subsidies in favor of targeted social spending can help both achieve fiscal consolidation and improve economic efficiency. Policy reforms in some (mostly oil-exporting) countries, along with lower international fuel prices, have reduced the size of fuel subsidies in sub-Saharan Africa, but there is a need to strengthen reforms in this area.*

Universal fuel and energy subsidies have been prevalent in sub-Saharan Africa, but they have substantial drawbacks. One of the rationales behind energy subsidies is that they can provide a highly visible benefit for important segments of the population. However, they are poorly targeted and have a negative impact on economic efficiency by fostering fuel overconsumption, curtailing investment and maintenance in the oil refining and electricity sectors, and crowding out more productive government spending (IMF 2013).

The sharp fall in international fuel prices since mid-2014 has been passed through only partially in sub-Saharan African oil importers, while oil exporters have actually increased domestic fuel prices (for example, Angola) (Figure 2.2.1). Fuel prices in the region are mostly set by governments, either on a discretionary basis or by automatic adjustment formulas. In fact, only about one-third of sub-Saharan African countries allow automatic adjustment of retail prices, while the rest set prices administratively. This pricing structure has historically translated into relatively low pass-through to changes in global oil prices.

**Figure 2.2.1. Sub-Saharan Africa: Pass-through of Changes in International Fuel Prices, June 2014–January 2017**




Sources: Country authorities; and IMF staff calculations.
Note: See page 76 for country groupings table and page 78 for country abbreviations.

A survey of fuel prices in the region suggests that between June 2014 and early 2017, the median pass-through coefficient (defined as the nominal change in domestic retail prices divided by the nominal change in international prices, both in domestic currency) was negative in oil exporters (–19 percent), as they increased fuel prices, and positive in oil importers (62 percent), as they (partially) transmitted the decline in global oil prices. Interestingly, oil exporters have increased prices of most fuel products since early 2015 (a median pass-through coefficient of 39 percent), following limited adjustments between June 2014 and early 2015.

For the region as a whole, the pass-through of the fall in gasoline and diesel prices has been smaller than for kerosene since mid-2014 (a median of 40 percent for the first two against 81 percent for the latter).

Fuel subsidies have fallen significantly since mid-2014. An analysis based on detailed price structures yields the following results:

- All countries with relevant information show sustained improvements in the ratios of actual to pretax fuel prices since mid-2014 (Figure 2.2.2). In contrast to the situation of a few countries at that time, average retail fuel prices in early 2017 covered all supply costs (that is, the cost, insurance, and freight import price plus transportation and distribution costs and profit margins).

This box was prepared by Mauricio Villafuerte with assistance from Tunc Gursoy.

**Box 2.2** *(continued)*

- A more stringent "posttax" analysis—which adds the sub-Saharan African average of gross tax per liter ($0.27) to the cost-recovery price—implies that, on an annualized basis, net fuel subsidies (that is, across all fuel products) fell by an average of 1 percent of GDP between mid-2014 and early 2017 (to almost 0 percent of GDP).

Fuel and electricity subsidies in sub-Saharan African countries have disproportionately benefited the better-off, but their removal would also hurt the poor. Since the top income quintile consumes significantly more than the bottom one, the former received on average more than six times total subsidies than the latter. However, a removal of energy subsidies can be distributionally neutral because the share of energy in household consumption is relatively similar across income quintiles. In the case of kerosene, which has a particularly high weight in low-income households' consumption basket, increasing its price can be distributionally regressive (Table 2.2.1).

A successful reform to domestic fuel and energy pricing requires a comprehensive strategy. The current environment of low international fuel prices facilitates the introduction of permanent changes. Still, country experiences suggest the following key elements of a reform (IMF 2013; Clements and others 2013): (1) a communication campaign; (2) phased and gradual price increases; (3) targeted social spending or essential investment to mitigate the impact of the reform on affected households and firms; (4) introduction of an automatic pricing formula; and (5) accompanying measures to improve the efficiency of state-owned enterprises and service delivery.

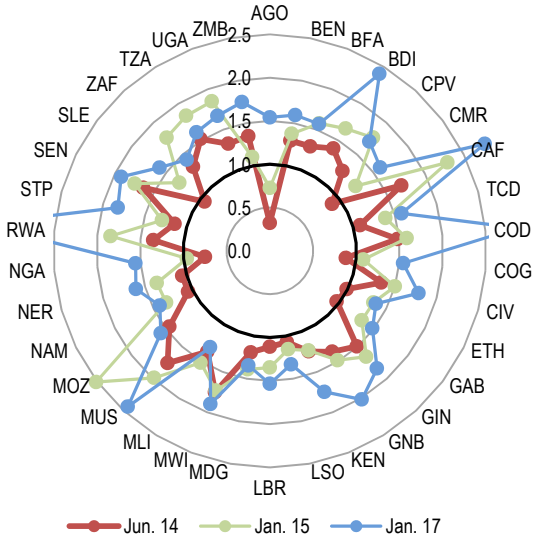
**Table 2.2.1. Sub-Saharan Africa: Impact of Fuel Price Increases per Consumption Quintile** *(Percent of total household consumption)*

| | Consumption Quintiles | | | | | |
|---|---|---|---|---|---|---|
| | Bottom | 2 | 3 | 4 | Top | All |
| Africa | | | | | | |
| Total | 4.7 | 4.8 | 4.8 | 5.0 | 5.3 | 5.0 |
| Direct Impact | 1.7 | 1.6 | 1.6 | 1.6 | 1.9 | 1.7 |
| Gasoline | 0.1 | 0.1 | 0.2 | 0.3 | 0.5 | 0.3 |
| Kerosene | 1.3 | 1.1 | 0.9 | 0.7 | 0.5 | 0.9 |
| LPG | 0.1 | 0.2 | 0.2 | 0.3 | 0.3 | 0.2 |
| Electricity | 0.2 | 0.3 | 0.3 | 0.4 | 0.6 | 0.4 |
| Indirect | 3.0 | 3.1 | 3.2 | 3.4 | 3.4 | 3.2 |

Source: Coady, Flamini, and Sears 2015, *The Unequal Benefits of Fuel Subsidies Revisited.*

Note: LPG = liquefied petroleum gas.

**Figure 2.2.2. Sub-Saharan Africa: Ratio of Actual to Pretax Fuel Prices**




Sources: Country authorities; and IMF staff calculations.

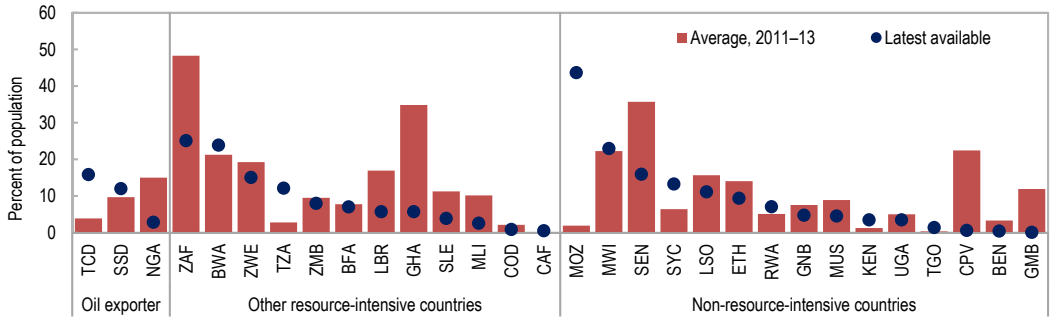
Note: See page 78 for country abbreviations.

## Box 2.3. Leveraging Existing Social Safety Nets

*While the growth impact of reduced government consumption may be relatively small, there may be important distributional consequences depending on the precise nature of the cuts. Governments can, however, build on existing programs to mitigate the impact on the most vulnerable, while establishing shock-response programs that can be triggered in an efficient and timely manner when shocks occur in the future.*

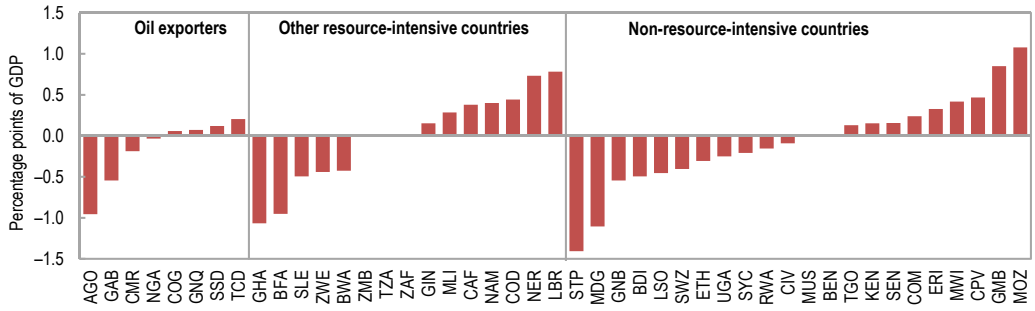
Over the past two decades, virtually all sub-Saharan African countries have introduced social safety net programs. These are noncontributory transfer programs that target the poor and vulnerable so that they can meet their basic consumption needs, mitigate the impact of shocks, and invest in the human capital and productive capacity of the poor (Beegle, Coudouel, and Monsalve 2017). While there are considerable differences in current coverage (Figure 2.3.1), many countries have seen an expansion in coverage in recent years as economies have slowed and countries have cut spending levels—including on key social components, such as health (Figure 2.3.2)—to preserve fiscal and debt sustainability.

**Figure 2.3.1. Sub-Saharan Africa: Coverage of Social Safety Nets, Average 2011–13 versus 2016 or Latest Available**




Source: World Bank, Atlas of Social Protection Indicators of Resilience and Equity (ASPIRE) database.
Note: See page 76 for country groupings table and page 78 for country abbreviations.

**Figure 2.3.2. Sub-Saharan Africa: Change in Health Expenditure, 2013–14**




Source: World Bank, *World Development Indicators*.
Note: See page 76 for country groupings table and page 78 for country abbreviations.

Governments have multiple options to expand social protection in the short term while enhancing the scalability of programs for the future (Table 2.3.1). At the same time, streamlining more regressive expenditures, such as fuel subsidies, and enhancing revenue mobilization and public investment efficiency can create fiscal space, making expansion of social safety nets consistent with overall fiscal consolidation (IMF 2017). Building on synergies between programs and enhancing the scalability of existing programs would, at the same time, increase the efficiency of service delivery going forward. Programs should answer to three main criteria: (1) *preparedness* for timely and effective shock response, such as through readily available data (for example, the registry of vulnerable households

This box was prepared by Aline Coudouel, Emma Monsalve, and Monique Newiak.

**Box 2.3** *(continued)*

and the inventory of possible payment networks); (2) *responsiveness*, with a trigger that activates the "response" phase to crises (for example, drought, food prices); and (3) *recovery* to terminate or adjust assistance when the shock subsides.

Some countries have put in place safety net programs that allow governments to react to shocks by temporarily scaling up programs. These include the Productive Safety Net Program in Ethiopia, which temporarily supported an additional 3.1 million beneficiaries for three months in 2011, and the Kenya Hunger Safety Net Program, which preregistered 374,000 households in the country's northern counties to facilitate transfers in case of shocks. Many other countries in the region are starting to invest in such mechanisms, which will allow a swift and efficient response in case of shocks.

**Table 2.3.1. Options for Scaling Up Social Safety Nets**

| | |
|---|---|
| **Vertical expansion** | Increasing the benefit value or duration of an existing program, including through adjustment of transfers or introduction of extraordinary payments/transfers. |
| **Horizontal expansion** | Adding new beneficiaries to an existing program, including through extension of geographical coverage of existing programs, extraordinary enrollment campaign, modifications of entitlement rules, or relaxation of requirements to facilitate participation. |
| **Piggybacking** | Using a social protection intervention's administrative framework, but running the shock-response program separately, including through the introduction of a new policy. |
| **Shadow alignment** | Developing a parallel humanitarian system that aligns with a current or possible future social protection program. |
| **Refocusing** | In case of budgetary constraints, adjusting the social protection system to refocus assistance on groups most vulnerable to the shock. |

Source: OPM 2015.

## Annex 2.1. Methodological Details

**Estimating Fiscal Multipliers Using Forecast Errors and the Local Projections Method**

To examine the effect of fiscal policy on output, our empirical approach follows IMF 2013 and Auerbach and Gorodnichenko 2013a, 2013b to identify unexpected changes in fiscal policy (or shocks) using forecast errors—calculated as the difference between the actual realization of fiscal variables and the forecasts made in the October *World Economic Outlook* of each year. This identification strategy overcomes the two issues often associated with the empirical estimation of the effect of fiscal policy on output—namely the fiscal foresight and the potential feedback from the state of the economy to the fiscal policy (for a discussion see Leeper, Walker, and Yang 2013 and Abiad, Furceri, and Topalova 2016).

In order to estimate output impulse responses following the unanticipated changes in fiscal policy, we use the local projections method (LPM) proposed by Jordà 2005 and advocated by Stock and Watson 2007 and Auerbach and Gorodnichencko 2013a, 2013b. The LPM has been widely used in the literature investigating fiscal multipliers. It is viewed as a flexible alternative to the typically used vector autoregression (VAR) estimation and it allows the estimation of nonlinearities in impulse responses (for example, under different states of the economy). Also, it does not require order assumptions and quarterly data—which is important in the context of sub-Saharan African countries where quarterly data are not consistently available.

To estimate the impact of fiscal policy shocks on economic activity we estimate the following model:

$$\frac{Y_{i,t+h}-Y_{i,t-1}}{Y_{i,t-1}} = \alpha_i^h + \gamma_t^h + \beta^{Ih} SI_{i,t} + \beta^{Ch} SC_{i,t} + \beta^{Rh} SR_{i,t} + \cdots$$
$$\sum_{j=1}^{p} \theta_{1,j}^{h} \Delta y_{i,t-j} + \sum_{j=1}^{p} \theta_{2,j}^{h} (I,C,R)_{i,t-j} + \sum_{j=0}^{p} \theta_{3,j}^{h} z_{i,t-j} + \sum_{j=1}^{p} \theta_{4,j}^{h} x_{i,t-j} + \ldots$$
$$+ \sum_{j=0}^{h-1} \theta_{5,j}^{h} (SI,SC,SR)_{i,t+h-j} + \sum_{j=0}^{h-1} \theta_{6,j}^{h} z_{i,t+h-j} + \varepsilon_{i,t}^{h}, \quad (2.1.1)$$

in which $i$ and $t$ denote countries and years, respectively, and $h$ is the number of periods ahead for which the multiplier is calculated. The left side shows the cumulative growth rate of real GDP at horizon $h$. Specifically, for $h = 0$, the equation estimates the contemporaneous effect of the fiscal shocks on real GDP, while the effect for each horizon $h = 1, \ldots, 5$ is estimated in separate equations. The $\beta$'s estimate the cumulative response of GDP over time given a shock in public investment, consumption, and revenues, and the corresponding standard errors are used to define confidence intervals.

The specification includes country and year fixed effects, the shocks in public investment, public consumption, and fiscal revenue at time $t$ (*SI, SC,* and *SR*), which enter the model divided by the level of GDP in $t-1$ to allow the direct calculation of the multiplier. Other control variables include lags of the rate of growth of real GDP; lags of the fiscal variables, which are predetermined at $t$; contemporary and lagged observations of external variables (denoted by $z$) proxied by the changes in commodity terms of trade and the real GDP growth of the trading partners; lags of other domestic macroeconomic variables (denoted by $x$), such as real money growth and inflation, to proxy monetary policy; and future realizations of the unexpected shocks in the fiscal variables and the exogenous variables (as suggested in Teulings and Zubanov 2014).

The fiscal multiplier, which represents the cumulative change of real GDP over $h$ periods following a one-unit shock in the fiscal variable, is obtained directly from the estimation. For example, the investment multiplier $\beta^{Ih}$ is:

$$\beta^{Ih} = \frac{Y_{i,t+h}-Y_{i,t-1}}{Y_{i,t-1}} \Big/ \frac{S_{i,t}}{Y_{i,t-1}}. \quad (2.1.2)$$

**Short- and Medium-Term Impact of Fiscal Consolidations and Role of Policies**

For the section focusing on the effect of fiscal consolidation on economic activity, we use the LPM following the recent literature (Dell'Erba, Koloskova, and Poplawski-Ribeiro 2014; Jordà and Taylor 2016; Devries and others 2011). We are interested in the effect of policy intervention $c_j$ on the outcome variable $Y$ (at time period $t + h$) relative to a baseline $c_0$. This is given by $E\left[\left(Y_{t,h}(c_j) - Y_t\right) - \left(Y_{t,h}(c_0) - Y_t\right)\right]$, and the policy intervention can be calculated by the local projection:

$$Y_{t+h} - Y_t = \alpha^h + \beta^h C_t + \theta^h \omega_t + \varepsilon_{t+h}, \quad (2.1.3)$$

in which the fiscal policy variable is $C_{i,t}$ and $\omega_t$ is the conditioning set. The expected impact of the policy intervention (which is equivalent to an impulse response from a VAR) is

$$E\left[\left(Y_{t,h}(c_j) - Y_t\right) - \left(Y_{t,h}(c_0) - Y_t\right)\right] = \beta^h\left(c_j - c_0\right) \text{ for } h = 1 \ldots, H.$$

To identify the effect of the policy intervention we estimate the following specification:

$$\frac{Y_{i,t+h} - Y_{i,t-1}}{Y_{i,t-1}} = \alpha_i^h + \gamma_t^h + \beta \boldsymbol{C_{i,t}} + \cdots$$
$$\sum_{j=1}^{p} \theta_{1,j}^{h} \Delta y_{i,t-j} + \sum_{j=0}^{p} \theta_{2,j}^{h} z_{i,t-j} + \sum_{j=1}^{p} \theta_{3,j}^{h} x_{i,t-j} + \ldots$$
$$+ \sum_{j=0}^{h-1} \theta_{4,j}^{h} C_{i,t+h-j} + \sum_{j=0}^{h-1} \theta_{5,j}^{h} z_{i,t+h-j} + \varepsilon_{i,t}^{h}, \quad (2.1.4)$$

in which $Y_t$ refers to real GDP, and $C_{i,t}$ corresponds to the fiscal policy variable. The conditioning set includes lags of real GDP growth and additional controls $z_t$, such as the growth of the trading partners, as a proxy for external demand; a country-specific measure of commodity terms of trade; and lags of real money growth and inflation, as a proxy for the monetary policy stance, $x_t$. In addition, we include future realizations of the fiscal policy variable and the exogenous variables.

To investigate the role of policies or macroeconomic fundamentals in fiscal consolidations, we augment (2.1.3) by introducing an interaction term between the fiscal policy variable and the other policy variables ($S_t$) of interest as follows:

$$Y_{t+h} - Y_t = \alpha^h + \beta^h C_t + \mu^h C_t \times S_t + \rho^h S_t + \theta^h \omega_t + \varepsilon_{t+h} \quad (2.1.5)$$

The total effect of the fiscal consolidation on economic activity is now given by the term $\beta^h + \mu^h \times S_t$, which depends on the different levels of the state variable $S_t$.

**Computing the Cyclically Adjusted Balance**

We define the cyclically adjusted primary balance following the aggregated approach discussed in Fedelino, Horton, and Ivanova 2009 as $CAPB = R^{Adj} - E^p$, in which $R^{Adj}$ corresponds to the cyclically adjusted revenues and $E^p$ refers to total primary spending. We adjust revenues by the business cycle $R^{Adj} = \frac{R}{(1+\gamma)}$, in which $R$ corresponds to government revenues, $\gamma$ refers to the estimated output gap, and $R^{Adj}$ refers to the cyclically adjusted revenues. The output gap is estimated using a Hodrick-Prescott filter with a smoothing parameter of 6.25 and extended historical data and five years of *World Economic Outlook* projections to reduce the end-of-sample bias.

## Annex 2.2. Variable List and Sources

| Description | Details | Source |
|---|---|---|
| Real GDP growth | Percent change | WEO |
| Real GDP per capita growth | Percent change | WEO |
| Public consumption | Percent of GDP | WEO |
| Public investment | Percent of GDP | WEO |
| Total government expenditure | Percent of GDP | WEO |
| Primary government expenditure | Percent of GDP | WEO |
| Capital government expenditure | Percent of GDP | WEO |
| Total government revenue | Percent of GDP | WEO |
| Tax revenue | Percent of GDP | WEO |
| Commodity revenues | Percent of GDP | WEO |
| Noncommodity revenues | Percent of GDP | WEO |
| Overall fiscal balance | Percent of GDP | WEO |
| Total public debt | Percent of GDP | FAD |
| External debt | Percent of GDP | WEO |
| General/central government | Dummy variable | WEO |
| Public investment efficiency (PIEX) | 0–1 scale | FAD |
| Broad money | Percent change | WEO |
| Inflation | Consumer price index, percent change | WEO |
| Claims on private credit | Percent change | IFS |
| International reserves | Percent of GDP | WEO |
| Trade openness | Exports plus imports as percent of GDP | PWT 9.0 |
| Commodity terms of trade | Index, based on commodity prices and net commodity exports | April 2016 REO: SSA |
| Oil exporters | Dummy (1 or 0) | WEO |
| Trading partners growth | Percent change | GEE |
| De facto exchange rate regime | DF: Hard = 1, conventional = 2, basket = 3, band = 4, crawl = 5, managed = 6, independent = 7 | October 2016 REO: SSA |
| De jure exchange rate regime | DJ: Hard = 1, conventional = 2, basket = 3, band = 4, crawl = 5, managed = 6, independent = 7 | October 2016 REO: SSA |
| Value-added agriculture | Percent of GDP | WDI |
| Gini coefficient | Gini index (World Bank estimate) | WDI |
| Health expenditure | Percent of GDP | WDI |
| Education expenditure | Percent of GDP | WDI |
| Social safety nets | Percent of population | ASPIRE |
| Bureaucracy | 0–4 scale; higher numbers are better | ICRG |
| Corruption | 0–6 scale; higher numbers are better | ICRG |
| Law and order | 0–6 scale; higher numbers are better | ICRG |

Note: ASPIRE = World Bank, Atlas of Social Protection Indicators of Resilience and Equity database; FAD = IMF, Fiscal Affairs Department database; GEE = IMF, Global Economic Environment database; ICRG = International Country Risk Guide database; IFS = IMF, International Financial Statistics database; PWT = Penn World Table 9.0; REO:SSA = *Regional Economic Outlook: Sub-Saharan Africa*; WDI = World Bank, World Development Indicators database; WEO = IMF, World Economic Outlook database.

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