



WP/12/93

IMF Working Paper

Fiscal Policies and Rules in the Face of Revenue Volatility Within Southern Africa Customs Union Countries (SACU)

Olivier Basdevant

IMF Working Paper

African Department

**Fiscal Policies and Rules in the Face of Revenue Volatility Within Southern Africa
Customs Union Countries (SACU)**

Prepared by Olivier Basdevant

Authorized for distribution by Calvin McDonald

April 2012

This Working Paper should not be reported as representing the views of the IMF.

The views expressed in this Working Paper are those of the author(s) and do not necessarily represent those of the IMF or IMF policy. Working Papers describe research in progress by the author(s) and are published to elicit comments and to further debate.

Abstract

Following the onset of the global economic crisis in 2008, SACU member countries have witnessed a significant growth slowdown, and a deterioration of their fiscal balances. This paper (i) assesses options for the design of the needed fiscal consolidation, and (ii) discussed medium-term fiscal policy rules that would help maintain a sound fiscal stance once consolidation has taken place. The main messages are: (i) government consumption cuts appears to minimize the negative impact on growth, and would be appropriate given the relatively large size of the public sector in each country, (ii) fiscal rules could be of particular interest for SACU members notably, a new customs revenue-sharing formula, procedural rules to strengthen budget process, and numerical rules at the national level.

JEL Classification Numbers: E62, H60

Keywords: Fiscal rule, Fiscal Adjustment, Southern Africa, SACU

Author's E-Mail Address: obasdevant@imf.org

CONTENTS	PAGE
I. Introduction	3
II. Fiscal Adjustment in BLNS in Response to the Loss of SACU Revenue	5
A. Risks of a significant loss of SACU revenue calls for fiscal adjustments and reforms	5
B. Analyzing Design Options for the Fiscal Adjustment in BLNS.....	6
III. Fiscal Coordination within SACU: Could Fiscal Rules be Appropriate?.....	12
A. Regional Integration Challenges Suggest Redefining the Revenue-Sharing Formula	12
B. Defining Procedural Rules to Prevent the Reoccurrence of Sustainability Concerns in BLNS	13
C. Defining National Numerical Rules	17
D. Enforcing Numerical Rules: Lessons from the Euro Area	20
IV. Conclusion	21
References.....	22
Tables	
1. SACU Transfers in BLNS and Simulated Loss.....	6
2. Expenditure Growth in BLNS, 2008–10	15
3. Comparing Two Ways to Achieve a Deficit Target	19
Figures	
1. Public Wage Bill in Sub-Saharan Africa	3
2. GDP Response to Different Policy Instruments	10
3. Current Account Balance Response to Different Policy Instruments.....	11
4. Deficit Bias in BLNS and its Impact on Debt Sustainability.....	14
Boxes	
1. SACU Revenue Sharing Formula.....	5
2. Fiscal Rules: Rationale, Benefits and Costs	17
3. General Options for the Design of a Fiscal Rule	20
Appendix I	24
A. Overview of the Model.....	24
B. Fiscal Consolidation Strategies.....	25

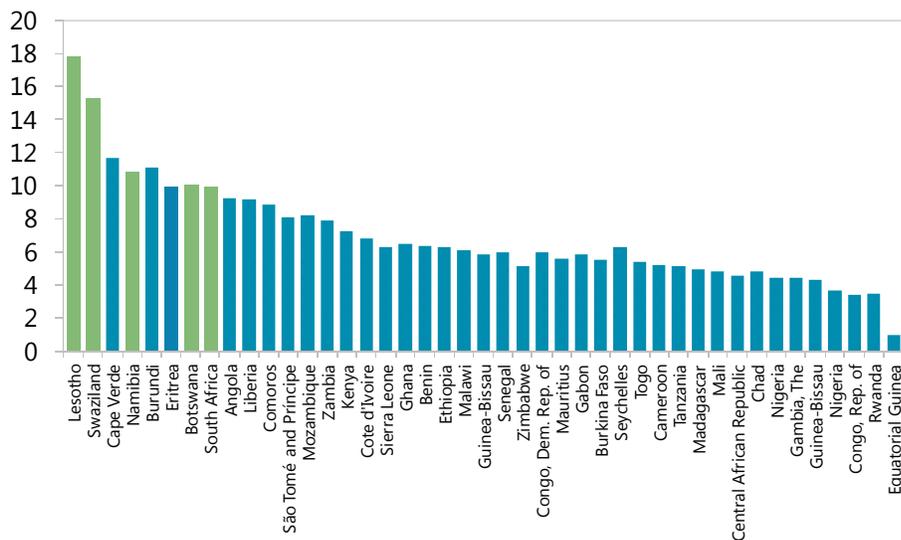
I. INTRODUCTION

Following the onset of the global economic crisis in 2008, SACU member countries have witnessed a significant growth slowdown, and a deterioration of their fiscal balances. This deterioration came from (i) a large reduction in SACU transfers, which account for a very significant share of total revenue for Botswana, Lesotho, Namibia, and Swaziland (BLNS),¹ owing, in part, to the global crisis, which reduced the SACU revenue pool, but also to the pro-cyclicality of the revenue sharing formula, which aggravated the decline (see Box 1 and Cuevas and others, 2012), as well as (ii) increased expenditures. It underscored the need for fiscal consolidation and a new set of institutional reforms to keep to prudent fiscal policies and reduce the dependence on SACU revenues.

BLNS relied on temporary high SACU revenues to finance high levels of recurrent expenditure, notably on the wage bill (Figure 1). Thus, lower SACU revenues translate themselves in higher fiscal deficits, which are difficult to reduce rapidly given the recurrent nature of many expenditure items.

Figure 1. Public Wage Bill in Sub-Saharan Africa

Wage Bill to GDP Ratio, Average 2006-2010 (Percent of GDP)



Sources: Country authorities; IMF staff estimates.

¹ Prior to the crisis, SACU transfers represented about 25-30 percent of GDP for Lesotho and Swaziland and around 10 percent for Botswana. The large swings in SACU transfers were contrasted by otherwise rather stable fiscal revenue.

The deterioration of fiscal balances in smaller SACU members warrants implementing fiscal adjustments (Section II.).² The fiscal policy implications have been contrasted between South Africa and the other SACU members (Botswana, Lesotho, Namibia, and Swaziland, thereafter BLNS). South Africa has been primarily affected by a significant contraction in activity, resulting from lower global economic activity. The policy response was to provide a fiscal stimulus to the extent that fiscal space was available.

South African fiscal policy has strong spillover effects for BLNS, through the determination of their receipts from the SACU pool. South Africa generates about 90 percent of the revenue of the SACU pool,³ and the existing rule make BLNS receipts heavily dependent on South Africa GDP projections. Thus, as described in Cueva and others (2011), revenue received in a given year t , are based on GDP projections for that year, and an adjustment is made in year $t+2$, to correct for discrepancies between the transfers received (i.e., based on the projections), and the level corresponding to the actual collection (i.e., based on actual numbers). Empirically, this two-year lag has led to severe pro-cyclical transfers, as downward adjustments have usually been concomitant with lower activity in the cycle. This pro-cyclicality has proven, in the context of the 2008 crisis, very damaging as the sharp contraction of SACU transfers contributed to create risks of debt distress.

The crisis also revealed in the importance of redefining fiscal coordination within SACU (Section III.), in the context of close economic and monetary integration within the Common Monetary Area (CMA) with the exception of Botswana.⁴ Without greater coordination, as well, as fiscal discipline at the country level, unsustainable fiscal policies in BLNS could eventually threaten the sustainability of the CMA. Fiscal policy is the main macroeconomic tool available to BLNS to respond to the loss of transfers. Moreover, BLNS also face significant development challenges (e.g., widespread poverty, HIV/AIDS), and high unemployment. As a result, the design of their fiscal adjustment strategies has to focus not only on the immediate goal of rebalancing public finances, but also on restoring external stability while maintaining positive growth prospects⁵. In contrast, policies implemented in South Africa would also need to factor their impact on BLNS, as they could create spillover effects for BLNS, whose magnitude may complicate the implementation of a sound fiscal policy.

² The loss of SACU revenue affected South Africa only marginally, as customs revenue makes only about 1 percent its fiscal revenue.

³ The revenue pool consists largely of revenue from customs duties and, to a lesser degree, excise taxes. The pool is managed by South Africa.

⁴ Under the CMA, Lesotho, Namibia, and Swaziland have pegged their currency 1-to-1 to the South African rand. Also the South African rand has legal tender in all of the CMA countries. While Botswana is not a member of the CMA, it has adopted a crawling-peg vis-à-vis the rand.

⁵ The issue of external imbalances is further discussed in a companion paper (Basdevant and others, 2011). Given the unprecedented large contraction of SACU transfers and issues on competitiveness for BLNS, the question of restoring external imbalances is essential in designing the fiscal adjustment. It reinforces the recommendation considering a fiscal adjustment that would restore competitiveness through a reduction in public sector wage bill.

This paper explores these two issues, i.e. the adjustment to lower SACU revenue and greater fiscal coordination in the region, by addressing the two following questions:

- How could BLNS adjust their fiscal stance given the large permanent fall in SACU transfers foreseen over the medium-term?
- Could the SACU region strengthen its regional fiscal institutions, especially given the existence of a currency union and the spillover effects of the South African economy on BLNS?

Box 1. SACU Revenue Sharing Formula

SACU revenue is composed of customs duties (C) and excises (E). According to the 2002 agreement, the revenue is shared following three components:

- Customs revenue is distributed on the basis of intra-SACU imports.
- Eighty-five percent of excise revenue is distributed on the basis of members' GDP.
- Fifteen percent of excise revenue is distributed equally through a development component, with an adjustment inversely proportional to the member's GDP per capita.

The revenue sharing formula is:

$$R_i = a_i C + 0.85 y_i E + 0.15 \frac{1}{5} E \left(1 - \frac{h_i - 1}{10} \right)$$

For each country i , a_i is the c.i.f. value at the border of imports of the country from all other SACU members, less re-exports, divided by the c.i.f. value of imports less re-exports for all SACU countries; y_i is the share of GDP of the country in the SACU GDP; and h_i the level of GDP per capita in the country divided by the average across SACU members.

The impact of the import decline on SACU revenue has been larger for the smaller members of the union. The decline in customs revenue implies a smaller common revenue pool to be shared across SACU members. This will affect the smaller SACU members the most, given the importance SACU transfers have in percent of total revenue and of GDP in BLNS, particularly Lesotho and Swaziland. The decline in excises, however, will have a smaller negative effect on smaller SACU members. It will partly be mitigated by the development component of the revenue-sharing formula. Overall, the effect of these two elements makes for a highly procyclical revenue-sharing formula for BLNS. The revenue gains during the boom period of 2004/05–2007/08 will now be partially reversed and require a significant fiscal adjustment to maintain fiscal and debt sustainability.

II. FISCAL ADJUSTMENT IN BLNS IN RESPONSE TO THE LOSS OF SACU REVENUE

A. Risks of a significant loss of SACU revenue calls for fiscal adjustments and reforms

BLNS face the risk of another decline of SACU revenue over the medium term, related to at least three structural factors: (i) a further slowdown in global economic activity, which would affect the SACU revenue pool; (ii) a reduction in the common external tariff rates as a result of trade liberalization; and (iii) the creation of the Southern African Development Community (SADC) customs union. There is also a risk that the sharp increase for 2012/13 would lead to over-payments to BLNS, thus contributing, in the future, to reimbursements to

the SACU pool. Finally, the current proposal by the SACU secretariat for a new revenue-sharing formula, would lead to further decline of transfers to BLNS. Quantifying with precision these risks is a daunting task beyond the scope of this chapter, but under the preliminary parameters under discussion on a revised revenue sharing formula and the impact on trade liberalization, the baseline estimate of the fall in SACU transfers ranges from 5 percent of GDP to 15 percent for BLNS countries (Table 1). This range of losses is used to derive the adjustment strategy, which is further discussed in this section. Although the specific magnitude of each country loss is yet unknown, the results are nevertheless qualitatively robust to this magnitude. Thus, the policy recommendations would remain broadly the same, even if the size of the needed fiscal adjustment were to be smaller.⁶

Table 1. SACU Transfers in BLNS and Simulated Loss

	(Percent of GDP)		Simulated loss
	Levels		
	2005/6–8/9	2009/10–12/13	
Botswana	9.1	7.8	-5.0
Lesotho	34.2	21.9	-6.7
Namibia	10.9	9.1	-5.0
Swaziland	23.5	15.9	-15.0

Source: Country authorities and IMF staff simulations.

Similarly, lower SACU transfers aggravate the external position of BLNS.⁷ The BLNS currencies are pegged to the rand (a crawling peg in the case of Botswana and parity for the others).⁸ Accordingly, the ability to use monetary policy actively is limited by the need to defend the pegs.

B. Analyzing Design Options for the Fiscal Adjustment in BLNS

In order to analyze options for BLNS fiscal adjustment, a dynamic stochastic general equilibrium (DGSE) model is used (see Basdevant and others, 2011, as well as Appendix I). The general-equilibrium structure provides a coherent framework to trace the macroeconomic effects of fiscal consolidations from the original steady state (i.e., the state before a SACU transfer reduction) to a new steady state (i.e., the state reached years after such a reduction). Policy choices are predicated on the assumption that the government does not engage in additional borrowing as a way to make up for the financing gap. Thus, the only

⁶ The policy response was also analyzed in the companion paper of Mongardini and others (2011).

⁷ While lower SACU transfers are partly mitigated on the external side by lower imports, the development component, not related to imports and particularly significant for Lesotho and Swaziland, makes the loss an acute external balance issue.

⁸ See Wang and others (2007), which discusses the Common Monetary Area under which Namibia, Lesotho, and Swaziland peg their currency to the rand.

option is to adjust the fiscal stance, either by increasing non-SACU revenue, decreasing spending, or both. The debt pattern remains otherwise fixed.⁹

Optimal fiscal adjustment strategies are based on multiple instruments, as the composition of the adjustment is of utmost importance.¹⁰ Five strategies were modeled: (i) increasing the consumption tax rate and cutting government consumption, (ii) increasing the labor tax rate and cutting government consumption, (iii) increasing both the labor and consumption tax rates, (iv) drawing down on the sovereign wealth fund for Botswana and increasing the consumption tax rate, and (v) cutting government consumption and investment. Multiple-instrument strategies are critical to securing broad political consensus on the reform, especially if otherwise only a specific section of the population (e.g., workers in the case of a labor tax increase) were to carry the burden of the adjustment. Given the large decline in transfers (about 15 percent of GDP in the case of Lesotho or Swaziland), a fiscal consolidation strategy that involves only one fiscal instrument, such as exclusively increasing the consumption tax rate or solely cutting government consumption, may not be sufficient to close the budget gap. For example, an adjustment of labor taxes in Swaziland would require more than tripling the effective tax rate, from about 20 percent to 70 percent; while the labor tax would have to be raised in Namibia by more than 10 percentage points (see Basdevant and others, 2011).

All countries have a dominant strategy, in terms of the impact on growth (Figure 2), by combining government consumption cuts and consumption tax increases,¹¹ except for Lesotho, which appears to have another option with consumption and labor taxes.¹² Fundamentally, cutting consumption, by lowering demand, puts downward pressure on wages, thus improving price competitiveness and growth prospects for the traded-good sector. Lesotho is a specific case, where the best strategy would first appear to combine a labor tax increase together with a consumption tax increase. This result comes from the large absorption of the non-traded sector output by the public sector, combined with a relatively smaller size of its traded-good sector. However, this policy would have to primarily rely on revenue collection improvements and reducing tax exemptions, instead of increasing policy rates (the VAT rate is around 15 percent for goods and services, which is relatively high compared to the region). Additionally the results come also largely from the very large size of the government (government spending represented about $\frac{2}{3}$ of GDP in 2009/10). From

⁹ Although the fiscal adjustment can be delayed by additional borrowing, it may not be feasible, or even desirable. With an unsustainable fiscal stance, delaying the adjustment would only create additional pressure on BLNS, and limit their capacity to raise adequate financing at a reasonable cost. Additionally, borrowing domestically can induce a bigger real depreciation, a bigger fall in nominal wages, leading to a stronger crowding out of private demand. A front-loaded adjustment may therefore be more appropriate, given the pressures on fiscal and external sustainability.

¹⁰ See Basdevant and others, 2011, for a more detailed analysis, especially on the underlying assumptions of the model and simulations.

¹¹ The effective tax rate would increase by about 3-4 percentage points across countries, to a maximum of 7 points (Swaziland).

¹² Tax adjustments may need to be coordinated within SACU.

this perspective, although simulations on government cuts highlight how it could lead to a significant contraction of the non-traded sector, the large size of the government would still point out the need to follow the route of spending cuts. It would also help further strengthen a relative weak external position (international reserves cover about 3½ months of imports). In contrast, the negative impact on productivity of lower public investment makes policies based on this instrument clearly second-best. Figure 2 shows that the GDP responses with public investment cuts range from 2 points lower than the steady state (Lesotho, Namibia) to 4–5 points lower (Botswana, Swaziland).¹³ Lower public investment spreads out to the rest of the economy by lowering the productivity of private investment. Even with a companion instrument, the strong negative impact of investment remains dominant. The simulation therefore has strong policy implications: to alter the negative impact of fiscal consolidations on growth, investment spending must be protected. However, the recommendation would only apply to spending that effectively contributes to enhancing the productivity of the whole economy. Ranking investment projects both from their costs and benefits perspectives is therefore essential. Cutting *prestige* investment spending would, in reality, be similar to a cut in government consumption, rather than a true investment cut. In addition, even potentially useful investment could be wasted for example by overpricing, execution delays, or lack of complementary investments.

The results are consistent with experiences of fiscal consolidations (IMF 2010a) as well as BLNS features. The adjustment should rely on spending cuts in an oversized public sector and on revenue-boosting measures where tax collection is low (IMF 2010a).¹⁴ On the expenditure side, adjustments have usually addressed either immediate risks, which are associated with cuts in recurrent spending, or future risks, which generally relate to health spending and population growth (HIV/AIDS, pension reform, healthcare reform). Additionally, Gupta and others (2004) show that, for developing countries, fiscal adjustments tend to be more persistent when based on expenditure measures. On the revenue side, measures have typically focused on reducing tax expenditures and increasing tax rates to levels comparable to regional features, while tax administration reforms have focused on a risk-based taxpayer compliance strategy. BLNS face both revenue and expenditure problems, with a stronger fiscal risk on the expenditure side. They all have large wage bills (Figure 1) that warrant reducing government spending, not only to improve fiscal balances but also to provide more incentives to work in the private sector and reduce reservation wages. Additionally, the quality of spending is questionable, owing to weaknesses in budget preparation and expenditure controls, suggesting that cuts could be identified in unproductive spending. Moreover, some countries face revenue issues: first, under the assumption of a medium-term fall in external revenue (SACU transfers, but also mineral revenue in Botswana and Namibia); second, tax exemptions (Lesotho, Swaziland), and finally a low voluntary compliance rate (all of BLNS). On the latter two, the authorities of each country have already

¹³ This result is robust to alternative experiments involving public investment cuts (see Basdevant and others 2011 for details).

¹⁴ Revenue measures have often been found more prominent for emerging and developing economies, which typically start from a low revenue-to-GDP ratio (Gupta and others, 2003; Ardagna, 2004).

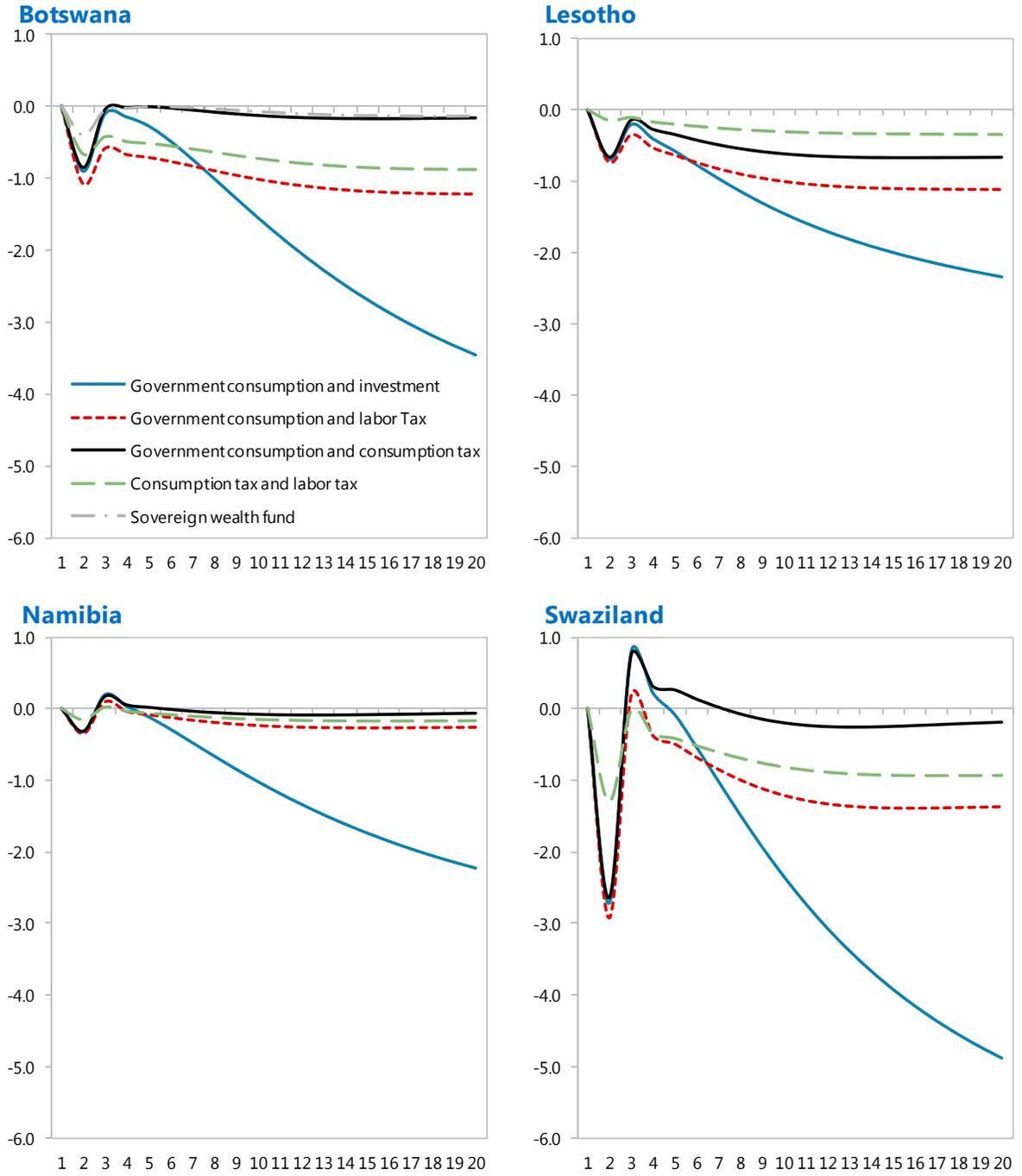
taken significant steps, either by removing tax exemptions (Swaziland submitted a law to that effect in June 2011), or by taking steps to reform tax administration according to a modern structure based on self-assessment and incentives for voluntary tax compliance (Botswana, Lesotho, Swaziland).¹⁵ Overall, a key challenge is to address potentially significant fall in SACU transfers and relatively high spending.

The sovereign wealth fund (SWF) in Botswana (the so-called Pula Fund) could also be used to ease the adjustment, but it has to be combined with other instruments. The effects from such a policy mainly come from the accompanying instrument (in our case a consumption tax), which adjusts to make up for SACU transfer reduction. Despite this caveat, the use of an SWF can indeed provide some relief in the adjustment effort. It has, however, two major hurdles: (i) the depletion of the SWF raises government net debt, potentially creating debt vulnerability even with an unchanged gross debt and (ii) it is better suited for a temporary shock, whereas the drawdown of the SWF cannot be sustained in the case of a permanent shock. Overall, the use of the SWF has not had a significantly different impact on growth than using the consumption tax alone—even in the case of Botswana, where the existing fund is large.

External imbalances are effectively reduced by the fiscal consolidation, mirroring the contraction of domestic absorption (Figure 3). By reducing government imbalances, the fiscal consolidation has a strong negative impact on domestic absorption. Overall the immediate deterioration of the current account balance, following the sharp drop in SACU transfers (Figure 3), is fairly limited. This reflects the strong fiscal response, the contraction in domestic demand, and competitiveness improvements. For most countries, with the notable

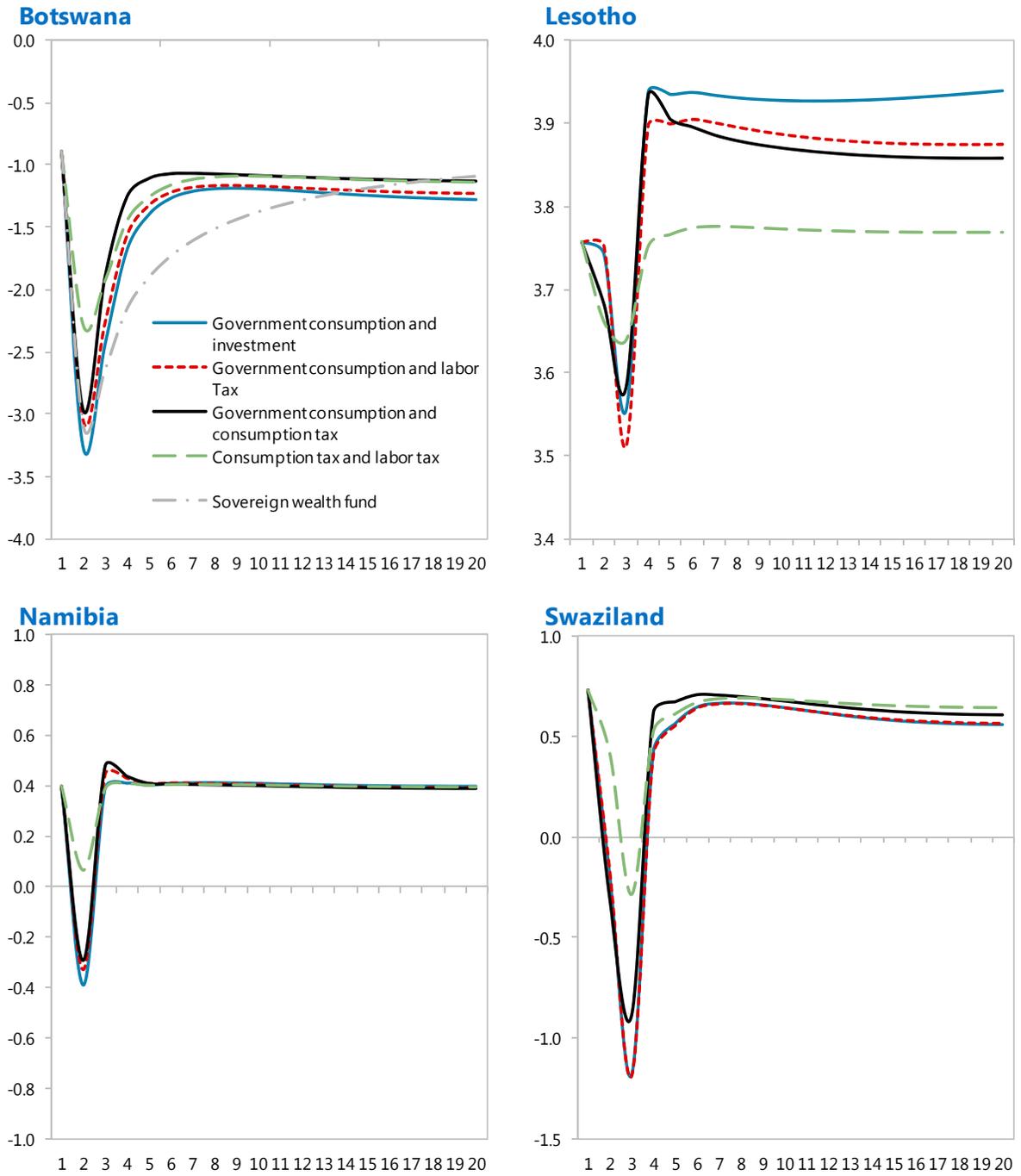
¹⁵ However, tax administration improvements, while essential, would not generally provide short-term gains (Russell, 2010).

Figure 2. GDP Response to Different Policy Instruments¹



Source: IMF Staff estimates and projections.
¹ Points of GDP deviation from steady-state.

Figure 3. Current Account Balance Response to Different Policy Instruments¹



Source: IMF Staff estimates and projections.

¹ Points of GDP deviation from steady-state. The current account balance is proxied by the sum of the trade balance and the SACU transfers, the other items of the balance of payment, with the exception of the

exception of Lesotho, all fiscal consolidation designs perform equally well over the medium term. After a short-lived deterioration of the current account balance, it takes about 1 to 2 years, on average, to reach a level similar to the one before the fall in SACU revenues. Not surprisingly, the adjustment is much slower when the SWF is used in Botswana, because the adjustment of demand takes place more gradually. Lesotho brings a different perspective to the fiscal consolidation. The best strategy in terms of the growth impact, namely, taxing consumption and labor income, is actually less efficient in improving the current account balance (by about ¼ percent of GDP). This is, again, due to the relatively lower weight of the external sector for this country and the relatively higher weight of the government sector.

III. FISCAL COORDINATION WITHIN SACU: COULD FISCAL RULES BE APPROPRIATE?

Elaborating a regional approach of fiscal discipline is appropriate within SACU, particularly in the context of an expected greater economic integration. As shown in this section, defining fiscal rules (Box 2) at the level of the SACU region as a whole as well as at a national level would be appropriate to tackle (i) the spillovers effect of South Africa fiscal policy on BLNS, (ii) deficit biases in BLNS, and (iii) anchoring strong fiscal adjustment into medium-term fiscal rules to preserve fiscal sustainability.

Taking into account the spillover effects of South Africa on BLNS would also be in the interest of South Africa, as fiscal imbalances in BLNS are, in the end, contingent liabilities for South Africa. Because of the CMA, and the perspective of further regional financial integration, South Africa is, *de facto*, lender of last resort for these countries. Greater financial integration of the SACU region could facilitate access to financing by BLNS through the South Africa bond markets. Issuing government securities denominated in rand would offer lower premia as the currency risk would disappear, although the sovereign risk would not disappear. There would be nevertheless a risk of creating a perception of sustainability¹⁶ for smaller SACU countries, which could translate into continued access to financing for some time even under unsustainable policies. This is, for example, the type of risk faced by the euro area, which led to debt accumulation beyond a sustainable level in some countries.

A. Regional Integration Challenges Suggest Redefining the Revenue-Sharing Formula

While South Africa implements a sound fiscal policy, its spillover effect on BLNS is not accounted for. South Africa enjoys some degree of economic stability, and does not face specific vulnerabilities on either its public or external debt (IMF, 2011).¹⁷ In particular, under the current revenue-sharing formula, SACU transfers are heavily dependent on South Africa projected GDP. While forecasting errors have a limited impact on South Africa, they induce large swings of revenue for BLNS, which are further aggravated by the pro-cyclicality of the formula.

¹⁶ Or a perceived assurance of bail out from South Africa.

¹⁷ Its sound fiscal management has also been helped with the adoption of a medium-term budget strategy, which anchors each annual budget into a medium-term perspective.

Numerical Rule 1: a new revenue-sharing formula for the SACU pool could be adopted, with the objective of making the transfers more stable and predictable. In essence, from a fiscal rule perspective, two characteristics would be essential for the rule to be sustainable and accepted: simplicity and transparency. Simplicity would suggest, for example, considering a “pay-as-you-go” redistribution, where revenue collected is redistributed in real time. This would avoid complicated formulas, and especially the pro-cyclicality of the existing rule.

Procedural Rule 1: A buffer could be established in the form of a stabilization fund at the level of the SACU region as whole. For example, differences in revenue distribution compared to the previous year could be allocated over a few subsequent years. Finally, the rule could also focus on revenue sharing, with development component being provided directly as budget support from the most advanced countries.

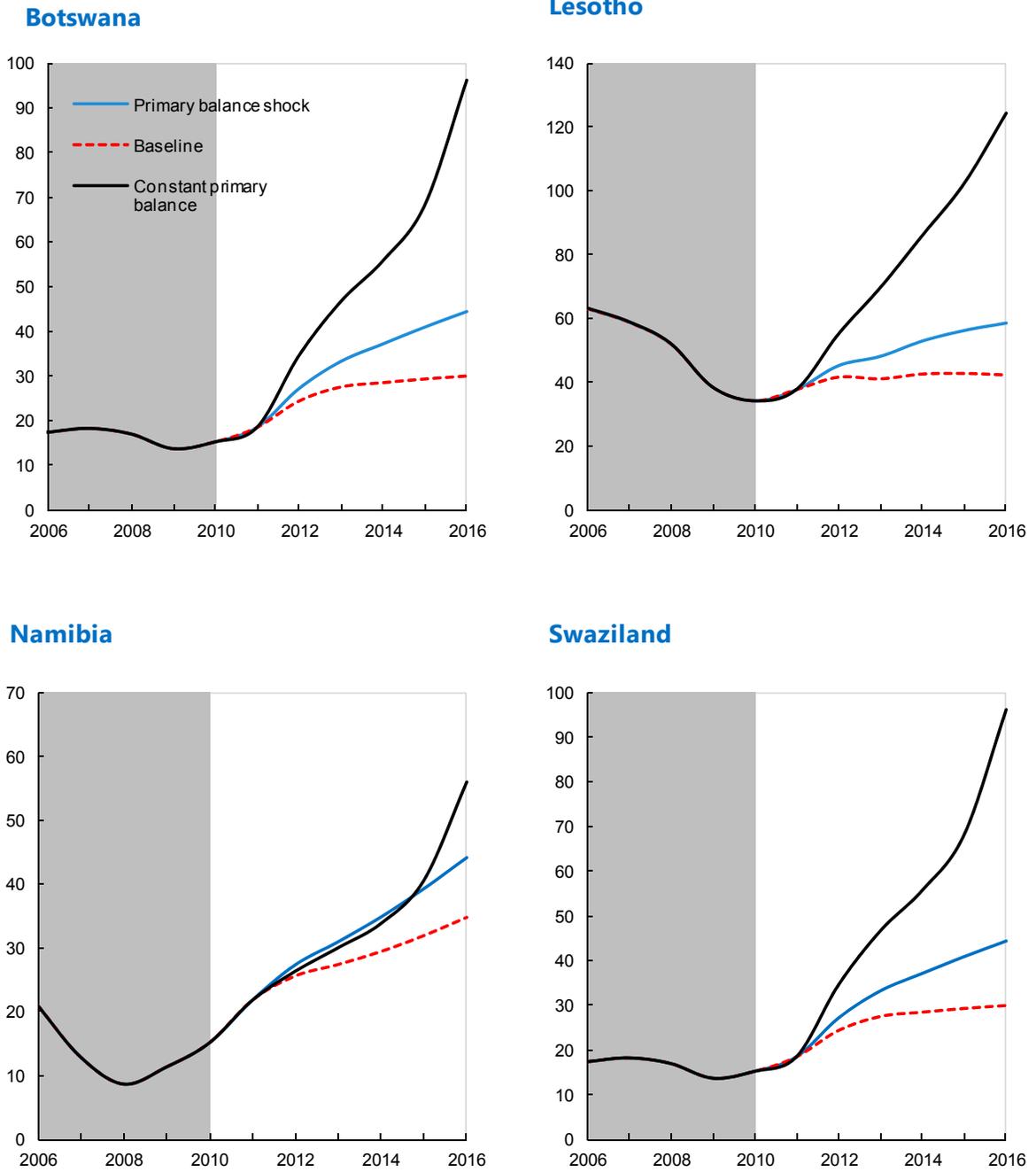
Addressing the volatility of SACU transfers is only one element for fostering fiscal sustainability. Two complementary sets of rules, explored in the next two sections, could therefore be considered: procedural rules, notably in BLNS, to strengthen the budget process, and numerical rules to foster fiscal responsibility over the medium term.

B. Defining Procedural Rules to Prevent the Reoccurrence of Sustainability Concerns in BLNS

Indeed, the global crisis showed that spending bias can rapidly build up (Table 2), which, combine to the loss in SACU transfers, has led BLNS to increase significantly their risk of debt distress, even though debt ratios were rather low prior to the 2008 crisis (Figure 4).¹⁸ While some countries (Botswana and Namibia) are more resistant to this shock than others (Lesotho and Swaziland), all indicate a rapidly growing debt burden, threatening fiscal sustainability.

¹⁸ Using the IMF templates for debt sustainability analysis, a simulation exercise was done for each country, assuming that expenditure levels over the medium-term would remain, in percent of GDP, at similar level than those attained over the past few years.

Figure 4. Deficit Bias in BLNS and its Impact on Debt Sustainability¹



Source: Country authorities; IMF Staff estimates and projections.

¹ Debt-to-GDP ratios (percent).

Table 2. Expenditure Growth in BLNS, 2008–10

	2008	2009	2010	2008	2009	2010
	(Annual growth rate)			(Cumulative growth rate)		
Botswana						
Expenditure	40.9	9.4	4.3	40.9	54.2	60.9
GDP	20.6	-9.2	14.5	20.6	9.5	25.4
Lesotho						
Expenditure	35.6	15.4	1.5	35.6	56.5	58.7
GDP	17.6	10.2	7.0	17.6	29.7	38.7
Namibia						
Expenditure	24.7	19.9	17.5	24.7	49.5	75.7
GDP	19.2	6.7	10.1	19.2	27.3	40.1
Swaziland						
Expenditure	34.2	24.1	1.4	34.2	66.5	68.8
GDP	12.8	6.7	7.3	12.8	20.3	29.1

Source: Acountry authorities; IMF Staff estimates. Growth rates are derived from nominal data.

In complement to specific design of the fiscal adjustment in BLNS, discussed in Section II. B. , addressing the spending bias requires securing a broad political and social support to correct this bias, and reduce odds of reoccurrence.¹⁹ Fundamentally, the issue here is about fiscal transparency, and disclosing and communicating about all the parameters of the adjustment.

Procedural rule 2: applying international best standards in terms of fiscal transparency, and reaching out to the public on the need for an adjustment. It would imply, among others, publishing accounts and budget execution reports, and having external assessment performed (overseen from parliaments, and external audits of public accounts) and made public. With the disclosure of budget documents, budget execution, and fiscal risks, governments could then have the tool to convince about the implication of the adjustment (or lack of) as well as their efforts to protect the most vulnerable. Communication campaigns could then be organized to inform the public about the scale of fiscal challenges and explain what can be reasonably achieved through reforms without overburdening taxpayers or unduly curtailing necessary public services. Similarly, communication of adverse consequences of not adjusting would also be essential, particularly in case of large fiscal adjustments. Additionally, transparency efforts would need to be complemented by efforts to improve the quality of public spending, for example by subjecting investment projects to cost-benefits analyses and publishing both the analyses and projects ranking. In order to deal with a large fiscal adjustment, and subsequently with the enforcement of a sound fiscal policy, BLNS would need to cast their policies with medium-term frameworks. The objective would be to anchor budgets to medium-term fiscal objectives. Such steps would complement existing efforts made to strengthen expenditure controls (Lesotho, Namibia, and Swaziland), as well as tax administration.

¹⁹ Large fiscal adjustments would typically require strong support from all stakeholders (Mauro, 2011).

Procedural Rule 3: Adopting – or improving – medium-term expenditure frameworks (MTEFs), to anchor the budgeting process on medium-term objectives. First, the authorities could, within MTEFs, define the pace of the adjustment. Two elements strongly favor a front-loaded adjustment: (i) the need to reassure markets and international partners, especially in a context where fiscal sustainability is at risk, and (ii) longer fiscal consolidations can increase the probability of halting the adjustment before its completion (von Hagen, Hallett, and Strauch, 2001; Tsibouris and others, 2006).²⁰ Second, In order to be credible, MTEFs would need to leave room for contingency planning. Such a space would be particularly relevant in the implementation of the fiscal adjustment plans. For 66 plans reviewed in Mauro (2011), the average discrepancy between the planned and actual improvement in the fiscal balance was about ½ percent of GDP.²¹ Finally, MTEFs would eventually become to tool to make national numerical rules operational. They would not only help bringing budgets in line with medium-term objectives, but would also offer a forum for all government agencies to agree jointly on a set of fiscal objectives.

²⁰ This is the main reason why large fiscal consolidations, especially in emerging and low-income countries, have tended to be more front-loaded (Tsibouris and others, 2006; Kumar, Leigh, and Plekhanov, 2007).

²¹ Contingency measures could also cover positive surprises, such as a higher growth outturn. The discrepancy was not related to the size of the adjustment, but instead to spending cuts that did not materialize. As a result, additional revenue measures were often taken to compensate for the difficulty in implementing spending cuts, thus improving the revenue outturn.

Box 2. Fiscal Rules: Rationale, Benefits and Costs

Numerical fiscal rules seek to address recurrent deficit bias, eventually improving the credibility of fiscal policies. A fiscal rule is a permanent constraint on fiscal policy, usually defined by numerical objectives, and/or procedures on the budget elaboration and implementation (Kopits and Symansky 1998, IMF, 2005 2009). The rule is permanent because it responds to a risk of deficit bias, i.e. the implementation of policies that are either sub-optimal (a deficit higher than its optimal level) or a threat to fiscal sustainability. Credible rules can lead to higher welfare than discretion (Barro and Gordon 1983, Drazen 2000), as well as lower risk premia (Hallerberg and Wolff, 2006).

Procedural issues need to be addressed first, so that numerical rules can be fully effective (Milesi-Ferretti 1997). For example, without transparency in public accounting, some “creative” accounting rules could be used to hide a missed deficit target. Improvements in procedural rules would typically cover (i) strengthening the position of the minister of Finance, (ii) limiting the scope of amendments to the budget during parliament discussions, (iii) enforcing hard budget constraint during the implementation phase. Fiscal transparency would also be essential to ensure strong political and social support for the rules.

In order to avoid being too rigid, numerical rules need to leave space for flexibility. Similarly to rules for monetary policies, fiscal rules could provide (i) a tolerance band for countercyclical policies and (ii) escape clauses, so as to temporarily suspend the application of the rules during exceptional circumstances. Rules can also create incentives for nontransparent behaviors, so as to comply only seemingly with the rules. In addition, the authorities may use legislation changes to alter rules so as to ensure formal compliance. All these potential hurdles underline the need for institution building, when necessary, and developing strong consensus on the rules.

As discussed by IMF (2009) and Debrun and Kumar (2007), successful implementations of fiscal rules are generally preceded with a period of consolidation. Although the introduction of fiscal rules has usually concurred with improved fiscal performances, the causality is not clearly established (IMF 2005, OECD 2007). International evidence suggests that the key to successful fiscal policy lies in factors that change the political climate in favor of fiscal sustainability. A cross-country statistical analysis undertaken by IMF staff finds that the intensity of national fiscal rules to be positively associated with the extent to which fiscal targets were met (IMF, 2005; 2009; 2010). In addition, fiscal councils and peer-monitoring processes can enhance accountability in implementing fiscal rules or adjustment plans.

When benefiting from broad support, and legal foundations (and not just political commitment), the implementation of fiscal rules is then facilitated. Fiscal rules usually imply costs for policy makers in case of non-enforcement, either in terms of political reputation costs for ruling parties or in terms of legal sanctions that require specific actions. A law-based rule would typically imply penalties in case of non-compliance, while a public commitment, coupled with external monitoring, raises general public awareness of deviations from the rule would create reputation risks for the government.

C. Defining National Numerical Rules

Once procedures and institutional reforms are in place, a set of numerical rules could be adopted (Box 3). Instead of having just one numerical rule (say, on the primary deficit), BLNS would benefit from a global approach to setting rules on their fiscal policy. Two SACU-wide numerical rules could be considered.

Numerical Rule 2: A common numerical rule on debt-to-GDP ratio could also be adopted. Although SACU members face very different challenges, in order for an economic

union to be viable, member countries need to be treated equally. As such, a long-term objective of keeping debt ratios below the same threshold for all countries would achieve such a result. For example, a threshold of about 40 to 50 percent would be relevant, as emerging economies have shown vulnerabilities for debt levels going beyond such threshold. In this respect it should be noted that Botswana has already adopted a debt ceiling of 40 percent of GDP, which is adequate for an emerging country.

Numerical Rule 3: Each member country could adopt a country-specific rule on its deficit so as to (i) comply with the SACU-wide debt ceiling over the medium-term, and (ii) respond to specific vulnerabilities. For example, while South Africa could adopt a fiscal deficit rule to allow for contra-cyclical intervention, the more vulnerable countries of the region (Lesotho, Swaziland) could first consider a deficit rule aimed at preserving debt-sustainability. Indeed, while the medium-term objective of a common debt ceiling would be desirable, these countries would probably need to constrain their deficit – and therefore their debt level – with much stricter limits until they address the source of their vulnerabilities. Specifically, their deficit level could be directly derived from debt-sustainability analysis. Additionally, all SACU countries face different access to financing, and while the most advanced (Botswana, Namibia, and South Africa), can raise more easily funds, the poorest members (Lesotho and Swaziland) cannot. In case of resource-rich countries the problematic can be different though. Botswana has already two numerical rules, one capping expenditure at 40 percent of GDP, the other being a “golden rule” where the ratio of non-investment recurrent expenditure to non-mineral revenue being below 1, so that mineral revenue is primarily affected to investment projects. A way to implement this rule with some flexibility would be to adopt a ceiling for the primary balance for a certain period, say, 3 years, and revisit the value every 3 years, based on the MTEF and financing conditions. . In case of resource-rich countries the problematic can be different though. Botswana has already two numerical rules, one capping expenditure at 40 percent of GDP, the other being a “golden rule” where the ratio of non-investment recurrent expenditure to non-mineral revenue being below 1, so that mineral revenue is primarily affected to investment projects. Another option would be to adopt a ceiling on expenditures which would be consistent with the primary balance objective. This would also help Botswana in the implementation of its fiscal rule, as the cap on expenditure can lead to procyclicality when diamond price increases (as it induces a higher GDP, thus increasing the maximum level of expenditure). Similarly, a target on non-mineral primary could also be adopted, or an expenditure rule based on real expenditure growth. Adopting an expenditure rule would indeed present significant advantages, as it would notably target the source of the fiscal imbalances, but also, if implemented successfully, would facilitate counter-cyclical intervention, by allowing automatic stabilizers to play on the revenue side (Table 3).

Table 3. Comparing Two Ways to Achieve a Deficit Target

	Fiscal balance	Expenditure rule
Strengths		
	Simple and transparent	Allows for (some) counter-cyclicality
	Consistent with DSA	Can be consistent with the DSA
Weaknesses		
	Pro-cyclical	Sensitive to assumptions (e.g. revenue growth)

Source: IMF staff.

The rule could preserve some flexibility to allow the government to react to exceptional events by temporarily suspending the rule. However, this would require two main elements: First, parliament would have to approve the government plan for the temporary suspension—ideally by a super majority to ensure that the political consensus is solid. Second, the government would have to have a strategy for reinstating the rule, say, no later than two years after suspension.

Box 4. General Options for the Design of a Fiscal Rule

Three general types of numerical rules could be considered: (i) debt rules, (ii) deficit rules, and (iii) expenditure rules. There is a trade-off between rules that preserve a sustainable debt-to-GDP ratio (debt or deficit rules) at the cost of a procyclical policy and rules that leave some room for countercyclical policies (expenditure rules) at the cost of less focus on a keeping debt sustainable (see table below).

Performances of Simple Numerical Rules Against Key Objectives¹

	Rule placing a simple ceiling on:			
	Debt ratio	Overall deficit	Primary deficit	Expenditure
Preserve a sustainable debt ratio	+++	++	+	-
Sound deficit level	-	+++	++	-
Avoids large adjustments in a single year	-	+	+	+++
Limit procyclicality	-	-	-	++
Target relatively controllable	-	+	++	+++
Comprehensive coverage	+++	+++	+++	-

Source: IMF Staff.

¹ +++ = very good, ++ = good, + = fair, - = poor.

Numerical rules would typically be simple, flexible, credible, and consistent with the ultimate goals (Kopits and Symansky, 1998). Simplicity facilitates the emergence of broad support and also can facilitate implementation (Debrun, Epstein, and Symansky, 2008). Even if rules generally provide rigidity, they should allow some flexibility. Like rules for monetary policy, fiscal rules could provide a tolerance band for countercyclical policies and escape clauses so that application of the rules could be temporarily suspended in exceptional circumstances.

Defining a rule would typically lead to a difficult arbitrage between simplicity and flexibility. For example, a rule could be based on cyclically adjusted variables to leave room for automatic stabilizers to operate. However, this would require identifying the position of the economy in its cycle, which is challenging when data are of poor quality or when the economic cycle is not well-established. Defining the time horizon over which the target should be met is also crucial in providing flexibility. Enforcing a rule on a year-to-year basis would have the advantage of simplicity; enforcing for a predefined period of time would give more flexibility, but at the cost of more complex enforcement.

D. Enforcing Numerical Rules: Lessons from the Euro Area

Notwithstanding the specific design of numerical rules, the euro area experience suggested that without enforcement mechanism at the national level, numerical rules are not fully effective. In essence, two main enforcement mechanisms would have to be introduced: independent oversight of the rules implementation, and legal requirements to comply with rules.

Constitutional amendments could be adopted by each country, to define the general principle of the rules. These amendments could later on be complemented with a fiscal responsibility law defining the specific features of the rule, notably the quantitative ceilings. The main advantage of such legal changes would create strong incentives for compliance, as they usually imply strong sanctions, and avoid backtracking on the fiscal rule. In addition, legal constraint on the budget deficit approved by parliament could be set, so as to require that it is within the boundaries of the rules.

A fiscal council could be set up at the level of the SACU secretariat to allow an independent and cross-country scrutiny of fiscal policies implemented. In order to be functional, the fiscal council would need to be independent of the political sphere. The council would then report to the public on a regular basis, say, quarterly, on the state of public finances, based on budget execution reports that would be provided by the SACU ministries of finance. If there is deviation from the rule during the year, the council would make this public. Government would then be required to explain to parliament and other SACU members the reasons for the deviations and to present a plan to correct for them before the end of the year.

IV. CONCLUSION

Fiscal adjustments for BLNS need to be complemented by key public finance management reforms to ensure their sustainability. Among such measures, the following are of critical importance: identifying contingencies, strengthening medium-term frameworks, and improving taxpayer compliance. All these measures require not only a well-designed fiscal consolidation plan but also continued efforts in fiscal transparency to ensure large ownership of the adjustment plans. From this perspective, public communication strategies on the specific targets to achieve, both in the short and medium term, can help in the adjustment, particularly if the instruments to achieve these targets are also specified. Committing to well-designed fiscal adjustments while preserving the most needed spending (education, health, and infrastructure) can indeed help secure broad support for reforms, not only from the population but also from donors.

Fiscal adjustments need also to be put in a regional and medium-term perspective of establishing fiscal rules. To be fully effective, the authorities would have to discipline themselves to adhere to the rule. This would require strong political ownership, as well as enforcement mechanisms. In this respect, rules could be enshrined as a law, especially a constitutional one, rather than being a simple political commitment. Adhering to best practices on fiscal transparency would be essential to build consensus on the rules. Finally, the creation of an oversight body, at the regional level, would be essential, so that country and regional surveillance can be effective.

REFERENCES

- Barro R. and D. Gordon, 1983, “A Positive Theory of Monetary Policy in a Natural Rate Model” *Journal of Political Economy*, 91: 589-610.
- Basdevant, O., Benicio, D., Mircheva, B., Mongardini, J., Verdier, G., Yang, S., and L.-F. Zanna, 2011, “The Design of Fiscal Adjustment Strategies in Botswana, Lesotho, Namibia, and Swaziland,” IMF Working Paper WP/11/266 (Washington: International Monetary Fund). Available via the internet: <http://www.imf.org/external/pubs/ft/wp/2011/wp11266.pdf>
- Cuevas, A., Engstrom, L., Kramarenko, V., and G., Verdier, 2012, “SACU Revenue Volatility: Roots and Options for Mitigation” in IMF, 2010, The Economics of Regional Integration: Current and Future Challenges for Southern Africa (Washington: International Monetary Fund)
- Debrun, X., and M.S., Kumar, 2007, “The Discipline-Enhancing Role of Fiscal Institutions: Theory and Empirical Evidence,” IMF Working Papers 07/171 (Washington: International Monetary Fund).
- Debrun, X., N. Epstein, and S. Symansky, 2008, “A New Fiscal Rule: Should Israel Go Swiss?” IMF Working Paper 08/87 (Washington: International Monetary Fund).
- Drazen, A., 2000, *Political Economy in Macroeconomics*, Princeton University Press, Princeton NJ.
- Gupta, S., Clements, C., Baldacci, E., Mulas-Granados, M., 2004, “The persistence of fiscal adjustments in developing countries”, *Applied Economics Letters*, Vol. 11, pp. 209–212.
- Hallerberg M. and G. Wolff, 2006, “Fiscal Institutions, Fiscal Policy, and Sovereign Risk Premia” Deutsche Bundesbank Discussion Paper # 35/2006.
- IMF, 2005, *Fiscal Responsibility Laws* (Washington: International Monetary Fund).
- IMF, 2009, *Fiscal Rules—Anchoring Expectations for Sustainable Public Finances* (Washington: International Monetary Fund). Available via the Internet: www.imf.org/external/np/pp/eng/2009/121609.pdf
- IMF, 2010a, *From Stimulus to Consolidation—Revenue and Expenditure Policies in Advanced and Emerging Economies* (Washington: International Monetary Fund). Available via the Internet: <http://www.imf.org/external/np/pp/eng/2010/043010a.pdf>
- IMF, 2010b, *Strategies for Fiscal Consolidation in the Post-Crisis World* (Washington: International Monetary Fund). Available via the Internet: www.imf.org/external/np/pp/eng/2010/020410a.pdf

- IMF, 2011, “2011 Article IV Consultation,” IMF Country Report 11/258. Available via the Internet: <http://www.imf.org/external/pubs/ft/scr/2011/cr11258.pdf>
- Kopits, G., and Steven A. Symansky, 1998, Fiscal Policy Rules, IMF Occasional Paper No. 162 (Washington: International Monetary Fund).
- Kumar, M., D. Leigh, and A. Plekhanov, 2007, “Fiscal Adjustments: Determinants and Macroeconomic Consequences,” IMF Working Paper 07/178 (Washington: International Monetary Fund). Available via the Internet: <http://www.imf.org/external/pubs/ft/wp/2007/wp07178.pdf>.
- Mauro, P., 2011, *Chipping Away at the Public Debt—Sources of Failure and Keys to Success in Fiscal Adjustment* (Hoboken: N.J.: John Wiley and Sons).
- Milesi-Ferretti G.M., 1997, “Fiscal Rules and the Budget Process” *Giornale degli Economisti* 110(1), pp. 5-40.
- Mongardini, J., D. Benicio, T. Fontaine, G. Pastor, and G. Verdier, 2011, “In the Wake of the Global Economic Crisis: Adjusting to Lower Revenue of the Southern African Customs Union in Botswana, Lesotho, Namibia, and Swaziland,” IMF African Department # 1/11 (Washington: International Monetary Fund). Available via the Internet: <http://www.imf.org/external/pubs/ft/dp/2011/afr1101.pdf>
- Tsibouris, G., M. Horton, M. Flanagan, and W. Maliszewski, 2006, “Experience with Large Fiscal Adjustments,” IMF Occasional Paper 246 (Washington: International Monetary Fund). Available via the Internet: <http://www.imf.org/external/pubs/cat/longres.cfm?sk=18309.0>
- Von Hagen, J., A. Hallett, and R. Strauch, 2001, “Budgetary Consolidation in the EMU,” *Economic Papers*, No. 148, March. Available via the Internet: http://ec.europa.eu/economy_finance/publications/publication11056_en.pdf
- Wang, J.-Y., I. Masha, K. Shirono, and L. Harris, 2007, “The Common Monetary Area in Southern Africa: Shocks, Adjustment, and Policy Challenges,” IMF Working Paper 07/184 (Washington: International Monetary Fund). Available via the Internet: <http://www.imf.org/external/pubs/ft/wp/2007/wp07158.pdf>

APPENDIX I

This section briefly describes the model used for simulating the effects of various fiscal consolidation strategies in response to the projected decline in SACU transfers. The model extends those constructed in Berg and others (2010), Berg and others (2011), and Mongardini and others (2011). Its dynamic, general-equilibrium structure provides a coherent framework to trace the macroeconomic effects of fiscal consolidations from the original steady state (i.e., the state before a permanent SACU transfer reduction) to a new steady state (i.e., the state reached years after such a reduction).

A. Overview of the Model

The model economy is populated by two types of households: savers and hand-to-mouth consumers. Savers are forward-looking, with access to financial and capital markets so they can smooth consumption across periods. In contrast, hand-to-mouth households consume all disposable income each period. A relatively large share of hand-to-mouth households is an important feature for low-income countries because of a less-developed financial sector. Savers, on the other hand, allocate their disposable income to various forms of assets (they include real money balances, domestic government bonds, and foreign assets), which are subject to portfolio investment costs, as a way to capture imperfect capital mobility. All households consume a composite good made of a traded good and a non-traded good.

The production of traded and non-traded goods uses labor (supplied by households), private capital, and public capital. Firms in the non-traded sector are monopolistically competitive and face price adjustment costs, so prices are sticky. Firms in the traded sector, on the other hand, face perfect competition and flexible prices. In both sectors, firms accumulate capital through investments, which are subject to adjustment costs. The presence of price and capital adjustment costs is important to capturing the macroeconomic short-run effects of the SACU transfer reductions.

In addition to the traded and non-traded good sectors, the economy includes a natural resource sector. Mining is a major economic activity in Botswana and Namibia, and resource revenue is an important part of government revenue.²² Including a natural resource sector makes it possible to analyze fiscal consolidation strategies that involve the immediate use of revenue associated with this sector or a gradual use of this revenue through de-cumulating a sovereign wealth fund. For simplicity, the resource sector is assumed to use only capital for production and all of its output is exported.

Tax policy in the model includes consumption taxes (a form of value-added taxes), labor income taxes, and resource taxes. It also allows the government to save resource revenue in a sovereign wealth fund. Government spending policy consists of transfers to households and purchases of goods and services for government consumption and investment. Government

²² For Swaziland the size of the natural resource sector is calibrated at almost zero.

consumption is assumed to be nonproductive,²³ and government investment can be transformed to productive public capital, raising the marginal productivity of private production inputs. Like private consumption, government purchases also consist of traded and non-traded goods. The composition depends on the degree of home bias of government purchases of each country.

B. Fiscal Consolidation Strategies

Single-instrument strategies

For adjustment strategies involving single instruments, the paper considers four instruments: cutting government consumption or investment and increasing the consumption or labor tax rate. To determine the adjustment magnitudes of an instrument, the adjusting instrument would vary to satisfy the government budget constraint each period, while all other fiscal variables are held at their original steady states. For example, when government consumption adjusts alone in response to a SACU transfer reduction, government investment, transfers, and all tax rates do not change while government consumption falls to balance the budget.²⁴

Government consumption cut implies the following:

- Inflation falls in the short run. Because of nominal price rigidities, the supply of non-traded goods contracts in response to lower demand. This contraction causes a decline in labor demand, which contributes, in turn, to a decline in real wages. With lower real wages, and hence lower real marginal costs, non-traded goods inflation falls. But because the exchange rate is fixed, this translates into a lower CPI inflation.
- The real exchange depreciates as non-traded good prices go down and traded good prices remain constant. The real depreciation makes traded goods relatively more expensive, lowering imports and inducing an increase in traded output. Here, the increase in traded output is accomplished by drawing capital and labor from the non-traded sector. Overall, the fiscal consolidation translates into an improved trade deficit.
- Real GDP is negatively affected. In the short run, the contraction in the non-traded sector, which is demand-determined, generates a short-lived decline in real GDP. Over time, as nominal rigidities dissipate, the demand-driven slowdown fades and, in fact, GDP bounces back. However, as public investment is kept constant whereas private investment declines, a persistent and negative effect on GDP exists over the medium term.

²³ This assumption could be relaxed, e.g., by including consumption in the utility function. However, the purpose of this paper is to focus on the fiscal adjustment and its growth implications, rather than welfare issues.

²⁴ Some of the single-instrument policies may not always work, as an expenditure cut can only be used to the extent that the level before the cut is greater than the fall in SACU transfers.

In comparison with the case of reducing public consumption, raising the consumption tax rate induces a smaller real depreciation but not necessarily a more negative effect on real GDP. Raising the consumption tax rate has a direct negative impact on private consumption. However, because private agents often have a lower degree of home bias than that of the government, the demand for non-traded goods does not fall as much as when public consumption is cut. As a result, the CPI inflation decline and the real exchange rate depreciation are not as pronounced as those resulting from reducing government consumption. With lower real depreciation, the increase in traded-goods production also is smaller.

Cutting government investment and raising labor tax rates have a more negative effect on real GDP than other instruments. The negative effects on real GDP are more pronounced when cutting government investment or raising labor taxes than when cutting government consumption or raising consumption taxes. The reason is that reducing public investment or increasing labor taxes have a *direct* impact on the supply side of the economy. Reducing government investment negatively affects both the marginal product of labor and the marginal product of capital (MPK). A lower MPK, in turn, discourages private investment, which has a long-lasting negative effect on GDP. Raising labor tax rates, on the other hand, mainly lowers the labor supply and hence employment. This has a direct negative effect on real GDP and an indirect effect through lowering MPK and discouraging private investment.

Multiple-instrument strategies

The following multiple-instrument strategies are also considered:

- *Increasing the consumption tax rate and cutting government consumption.* The consumption tax rate rises in response to a reduction of SACU transfers and is complemented by cutting government consumption, provided that all other fiscal variables (government investment, transfers to households, all tax rates except the consumption tax rate, and total government debt) do not change from the original steady state.²⁵
- *Increasing the labor tax rate and cutting government consumption.* Similar to the previous option, the labor tax rate responds to a reduction of SACU transfers. For a

²⁵ Specifically, let τ_t^c be the consumption tax rate, s_t be the relative price of a unit of foreign goods to domestic consumption goods, and A_t^* be the SACU transfers. Then,

$$\log\left(\frac{\tau_t^c}{\tau^c}\right) = \rho_\tau \log\left(\frac{\tau_{t-1}^c}{\tau^c}\right) + \phi^{tc} \log\left(\frac{s_t A_t^*}{s A^*}\right), \quad \text{with } \phi^{tc} \leq 0, \quad \text{where } \rho_\tau \text{ indicates the persistence of the}$$

consumption tax process, and a variable without a time subscript indicates its original steady state. The equation implies that a 1 percent reduction of SACU transfers from its steady state triggers a ϕ^{tc} -percent increase in the consumption tax rate from its original steady state. Given the new consumption tax rate in the equation above and all other fiscal variables remaining unchanged, government consumption adjusts to satisfy the government budget constraint each period (see (A.24) in Appendix I).

given labor tax rate and other fiscal variables (at their original steady states), government consumption adjusts to satisfy the government budget constraint.²⁶

- *Increasing both the labor and consumption tax rates.* Under this option, the labor tax rate follows a similar rule to the one of the previous case. The consumption tax rate adjusts to satisfy the government budget constraint, and all fiscal variables are set to their steady states each period except the consumption and labor tax rates.
- *Drawing down on the sovereign wealth fund and increasing the consumption tax rate.* The sovereign wealth fund is assumed to earn a constant rate of return, and its interest income is treated as part of government revenue each period.²⁷ The consumption tax rate adjusts to satisfy the government budget constraint each period, provided the sovereign wealth fund and other fiscal variables are held at their steady states.²⁸

Table 1 Figure 2 Figure 2 Figure 3

²⁶ Let τ_t^l be the labor tax rate. It follows the following process:

$$\log\left(\frac{\tau_t^l}{\tau^l}\right) = \rho_\tau \log\left(\frac{\tau_{t-1}^l}{\tau^l}\right) + \phi^{ll} \log\left(\frac{s_t A_t^*}{s A^*}\right), \quad \text{with } \phi^{ll} \leq 0.$$

²⁷ See (A.22) and (A.25) in Appendix I for resource revenue and total government revenue.

²⁸ Let F_t^* be the sovereign wealth fund that holds international financial assets, π^* be the foreign CPI inflation rate, and n be the long-run deterministic growth rate of the economy. When the sovereign wealth fund responds to the reductions in SACU transfers, it evolves according to the process,

$$\log\left(\frac{F_t^*}{F^*}\right) = \frac{1}{n\pi^*} \log\left(\frac{F_{t-1}^*}{F^*}\right) + \phi^f \log\left(\frac{s_t A_t^*}{s A^*}\right), \quad \text{with } \phi^f \leq 0.$$