BUILDING A COMMON FUTURE
IN SOUTHERN AFRICA
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Regional economic integration in sub-Saharan Africa can play a critical role in strengthening private sector activity and supporting growth. The vision formulated by the Heads of States of the Southern African Customs Union (SACU) in 2010 for “an economic community with equitable and sustainable development, dedicated to the welfare of its people for a common future” underscores that deeper regional integration can lead to higher sustainable growth, more jobs, and better living standards for the people of Southern Africa. For this vision to fully materialize, though, SACU member states (Botswana, Lesotho, Namibia, South Africa, and Swaziland) must still overcome a number of policy challenges.

This book, Building a Common Future in Southern Africa, represents a broad-based and valuable contribution by my IMF colleagues to finding practical solutions to these policy challenges. The areas covered in the book include the welfare gains from regional and monetary integration, possible changes to the SACU revenue-sharing formula that could reduce volatility and facilitate regional integration, a framework of fiscal rules to maintain budgetary discipline at a national level, and policies that could reduce the high unemployment rate within the region. The policies discussed in the book lay out a possible roadmap to implement the vision articulated by the SACU Heads of States in 2010.

In each chapter the findings offer specific insights for regional integration. Starting with the overall integration process, Chapter 2 of the book estimates significant welfare benefits from the existing union. The empirical evidence indicates that SACU has been the most successful trade arrangement in Africa, generating significant trade opportunities for its members both within and outside of the union and with only weak evidence of diverting trade from other parts of the world. Such beneficial effects on trade have already produced higher living standards and more jobs. More importantly, such evidence suggests that deeper regional integration in Southern Africa could generate further gains.

Yet, there is evidence that the current SACU revenue-sharing formula has drawbacks in that it contributes to high revenue volatility for the smaller members of the union (particularly Lesotho and Swaziland) and may hinder regional integration. Chapter 3 provides concrete short- and medium-term proposals on how the formula could be revised in order to reduce volatility and foster integration, while acknowledging that the specific distributional aspects of the formula will need to be decided by SACU member states themselves.

On fiscal policy, drawing on the lessons from the European crisis, Chapter 4 proposes a set of policies to reach a sustainable position for the smaller countries of the union, while minimizing the short-term impact on growth. It also describes a framework to implement fiscal rules at a national level in order to maintain fiscal sustainability over the medium term.
The book proceeds to discuss the benefits of greater monetary integration in the context of the rand Common Monetary Area (CMA), comprising Lesotho, Namibia, South Africa, and Swaziland. It estimates that there are welfare benefits for all current members of the CMA, but that those benefits are largest for the smaller members of the union. The book cautions, however, against moving further toward full monetary integration, as—given still-significant underlying differences in economic structures—recent European experience shows that this could reduce the incentives for monetary stability. Enlargement of the CMA could also be beneficial for existing and new members.

In view of the main economic challenges in the region, no assessment would be complete without addressing the thorny issue of the high level of unemployment in all SACU countries. Chapter 6 identifies that one source for the high unemployment level in Southern Africa is the skills mismatch between job seekers and job vacancies—the result of an educational system that has not fully kept up with the needs of the labor market. As such, the public sector often becomes the employer of last resort to mitigate the level of unemployment. Reforms are therefore needed to both public employment policies and the educational system to create a labor force that is more flexible and can better respond to the needs of a changing economy. This—together with a business climate more conducive to private investment—could foster higher growth and more job opportunities.

Finally, this book represents what I hope is the beginning of a deeper policy dialogue between the SACU members and the IMF on ways to implement the vision of the SACU Heads of States. As demonstrated by the IMF’s involvement in other regional groupings (the Central American Free Trade Agreement, the East African Community, the European Union, the West African Economic and Monetary Union, etc.), the expertise of IMF staff can assist country authorities in realizing the full benefits of greater regional and monetary integration. Our hope is to contribute in a similar way to stronger regional and monetary integration in Southern Africa.

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Deeper integration is a stated public objective of the members of the Southern African Customs Union (SACU), the oldest customs union in the world. The vision of the SACU heads of state is for SACU to become “an economic community with equitable and sustainable development, dedicated to the welfare of its people for a common future.” Although SACU is currently facing challenges related to the volatility of its customs revenue, the management of fiscal policy, and high levels of unemployment, significant opportunities also lie ahead. In particular, establishing a common market and a monetary union could bring higher economic growth and greater welfare benefits to its people. This book offers a number of policy options to address these current challenges and realize future opportunities through the analysis of macroeconomic and structural issues facing SACU countries from the perspective of IMF staff. At the outset, the book identifies the significant benefits associated with membership in SACU and the Common Monetary Area (CMA). Second, it offers practical solutions to the volatility of the current SACU revenue-sharing formula at a regional level and the management of fiscal policy at a national level. Third, it suggests that tackling the high level of unemployment within SACU members will require both a change in public employment policies and reform of the educational system to respond to the changing needs of the labor market. Fourth, it outlines a road map toward deeper regional integration.
Acknowledgments

The authors would like to thank the country authorities of Botswana, Lesotho, Namibia, South Africa, and Swaziland, and the SACU Secretariat for their helpful comments on an earlier draft of this publication, and for organizing a technical workshop in Swakopmund, Namibia, on December 2, 2012, at which the findings of this book were discussed. The authorities of a number of the SACU member countries have indicated that they have concerns with some of the conclusions in this book, but would not stand in the way of the IMF in publishing this book.

Our gratitude also goes to our IMF colleagues Sharmini Coorey, Anne-Marie Gulde, and Calvin McDonald for their support for this publication, their guidance, and their useful comments. We are also indebted to the Publications Advisory Board and other IMF colleagues for their comments and support.

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This publication would not have been possible without the excellent research assistance of Emily Forrest and editorial support of Breda Robertson and Karen Coyne. All remaining errors or omissions are, of course, our own.
Abbreviations

ANDEAN  Andean Community (customs union comprising Bolivia, Colombia, Ecuador, and Peru)
BLNS   Botswana, Lesotho, Namibia, and Swaziland
CCB    common central bank
CEMAC  Central African Economic and Monetary Community
CEPII  Centre d'Etudes Prospectives et d'Informations Internationales
CMA    Common Monetary Area
COMESA Common Market for Eastern and Southern Africa
DMP    Debrun Masson Pattillo
DOTS   IMF, Direction of Trade Statistics
EAC    East African Community
ECOWAS Economic Community of West African States
EU     European Union
ILO    International Labor Organization
LNS    Lesotho, Namibia, and Swaziland
MERCOSUR Common Southern Market
MTEF   Medium-term expenditure framework
NAFTA  North American Free Trade Agreement
OCA    optimum currency area
OECD   Organization for Economic Cooperation and Development
RMA    Rand Monetary Area
ROW    Rest of the world
RTA    Regional trade agreement
SACU   Southern African Customs Union
SADC   Southern African Development Community
SARB   South African Reserve Bank
SSA    sub-Saharan Africa
SWF    sovereign wealth fund
WAEMU  West African Economic and Monetary Union
WDR    World Development Report
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The Southern African Customs Union (SACU) celebrated its 100th anniversary in 2010. As the oldest customs union in the world, SACU has brought significant benefits to its five member countries, Botswana, Lesotho, Namibia, South Africa, and Swaziland (Figure 1.1). The significant degree of trade integration among its member countries has facilitated trade within and outside SACU and thus improved living standards. All members, excluding Botswana, also benefit from the Common Monetary Area (CMA), in which the currencies of Lesotho, Namibia, and Swaziland are fixed at parity with the South African rand, which is also accepted as legal tender in these countries. Regional and financial integration have improved the welfare of the people of Southern Africa.

The opportunity in the future for the members of SACU is to reap the benefits of even deeper regional and financial integration. As articulated by the SACU heads of state, the vision is for SACU to become “an economic community with equitable and sustainable development, dedicated to the welfare of its people for a common future” (SACU, 2010, p. 2). This vision calls for the eventual establishment of a common market by eliminating fiscal frontiers; liberalizing the movement of goods, services, and factors of production; and harmonizing macroeconomic and fiscal policies in the context of a possible future monetary union.

This chapter outlines the existing benefits, current challenges, and future opportunities of this regional integration process in Southern Africa. It draws on the analytical research presented in the subsequent chapters to distill key findings and policy recommendations that would support the goal of deeper regional integration.

**BENEFITS OF SACU AND THE CMA**

The economic benefits of membership in SACU are significant. As discussed by Engstrom and Verdier in Chapter 2, the analysis of bilateral world trade flows using a gravity model indicates that SACU membership has significantly facilitated trade creation, but has not created any significant trade diversion. Specifically, SACU outperforms all other African trade arrangements with regard
to its positive impact on trade creation. Accordingly, further trade integration, including through the establishment of a common market within SACU, is likely to be beneficial in fostering further trade creation and increasing living standards. The study also finds no evidence of export diversion, and the evidence on import diversion is inconclusive at best. The public debate in SACU has often focused on the claim that there is a negative polarization impact on Botswana, Lesotho, Namibia, and Swaziland (BLNS) from being in a customs union with a much larger and more developed economy. Even if the negative effects from trade diversion are limited, the results are not inconsistent with the possibility that there are negative externalities on the production structure—that is, BLNS would produce a different set of goods if they were insulated from their neighbor. This could be related to the fact that BLNS are on the periphery of an industrial core (South Africa). In addition, even in the absence of trade diversion, a case for compensatory transfers can still be made if it is clear that the structure of the common external tariff benefits one member of a customs union at the expense of other members. For example, a significant proportion of SACU import tariffs is collected on automobiles, an industry almost entirely based in South Africa. BLNS could, therefore, make legitimate claims that they should be compensated for extra-normal profits earned by South African automobile producers as a result of the common external tariff. Overall, the main goal of future reforms should be to increase the benefits of trade integration.

Similarly, membership in the CMA also produces beneficial welfare effects. Using an intuitive model of the costs and benefits of currency unions, Asonuma, Debrun, and Masson (Chapter 5) conclude that membership in the CMA benefits all its members to varying degrees. The largest benefits go to the smaller

**Figure 1.1** The Southern African Customs Union

Source: IMF staff estimates.

Note: Nominal GDP and nominal GDP per capita in U.S. dollars for 2011.
members, with welfare gains (compared with an independent monetary policy) estimated to be between 1.7 and 6 percent of GDP. Although South Africa’s gain is less than 0.5 percent of GDP, it is still positive because the use of the rand in other countries reduces the incentives for South Africa to monetize its own deficit, the so-called inflation bias. The creation of a genuine CMA-wide monetary union with a regional central bank would come at the expense of some forgone anti-inflationary credibility. The authors apply the same analytical framework to calculate the net benefits of a hypothetical expansion of the CMA to other countries of the Southern African Development Community. Most countries would benefit from the CMA, with the exception of Angola, Mauritius, and Tanzania.

CURRENT CHALLENGES

Notwithstanding the benefits mentioned above, SACU is experiencing significant challenges. The most pressing one at a regional level arises from the volatility of SACU revenue. For the smaller countries of the union, Lesotho and Swaziland, SACU revenue has over the past three years fluctuated by more than 20 percent and 15 percent of GDP, respectively, making it very difficult to manage public finances. A major factor behind the volatility of SACU transfers is that volatile customs duties are the main revenue source for the common pool. In Chapter 3, Cuevas, Engstrom, Kramarenko, and Verdier provide some practical solutions for reducing the volatility of SACU revenue. In the short term, one option would be to extend the period for correcting over- and underpayments to SACU members, currently set at two years. Alternatively, only the structural component of SACU revenue could be transferred to members, whereas the cyclical component could be saved in the common revenue pool. Over the medium to long term, SACU members could form an economic union by eliminating fiscal frontiers. They could distribute some of the revenue pool as regional funds, as in the European Union. SACU members would also benefit from preparing themselves for the effects of future trade liberalization, which is likely to erode revenue collection over the long term, by developing domestic sources of tax revenue. A move to a destination principle for the distribution of SACU revenue would be contrary to greater regional integration because it would erect stricter fiscal frontiers and hinder trade creation.

The recent decline in SACU transfers has also called for significant fiscal adjustment in BLNS. In Chapter 4, Basdevant discusses the best fiscal strategy for implementing the adjustment, based on simulations of a stochastic dynamic general equilibrium model presented in Mongardini and others (2011) and Basdevant and others (2011). The simulations indicate that the best fiscal strategy for minimizing the impact on growth is to reduce recurrent expenditure, particularly the

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1 The Southern African Development Community comprises Angola, Botswana, the Democratic Republic of the Congo, Lesotho, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zambia, and Zimbabwe. Madagascar’s membership was suspended in 2009.
wage bill, while relying mainly on consumption taxes to increase revenue. To maintain a sustainable fiscal position in the medium term, Basdevant also proposes a set of possible national-level fiscal rules appropriate for SACU members. Beyond the redesign of the SACU revenue-sharing formulas, SACU members could adopt fiscal balance or expenditure rules at a national level to strengthen the credibility of their policy frameworks. Both rules have pros and cons, and would need to be supported by independent supervision from fiscal councils and by appropriate communication strategies by the government. For Botswana and Namibia, these rules would also need to take into account the volatility of mineral wealth and the appropriate intergenerational considerations associated with the use of mineral resources.

Finally, all SACU members are facing unemployment crises of historic proportions. Available statistics show that the official unemployment rate ranges between 20 and 50 percent and is mostly a youth unemployment problem. Leigh and Flores indicate in Chapter 6 that the origin of the problem is the significant skills mismatch between the new entrants to the labor force and the needs of the labor market. Although there is no single solution to the problem, the authors identify a set of policies that, together with higher growth, could alleviate the unemployment crisis. In particular, public sector hiring practices and wage policies, reinforced by strong labor unions, have distorted the labor market. This clearly requires a shift in government employment and wage-setting policies to align them with private labor market standards. In addition, education policies in SACU urgently need to be aligned with the skills needs of the private sector. This alignment could be accomplished by improving the quality of educational spending to support public-private partnerships for skills development, with a focus on vocational and technical training.

FUTURE OPPORTUNITIES

The main objective of deeper integration within SACU is the establishment of a common market. To allow for the free movement of goods and services, fiscal frontiers have to be eliminated and standards harmonized. As a first noteworthy step in this direction, starting on April 1, 2012, all SACU members implemented a value added tax (VAT) with very similar rates. This structure could lead to a SACU-wide system of VAT refunds so that the refunds would not need to be claimed at the border. A second step would be the consolidation of intra-SACU customs borders, which would provide a one-stop shop for intra-customs clearance. This could then lead to the eventual elimination of intra-SACU customs posts, allowing for the free movement of goods across the entire SACU region. Third, product standards need to be harmonized so that goods can adhere to a unique SACU-wide set of standards. In this respect, a SACU-wide standards
agency could be established with the authority to harmonize existing standards across SACU and set new standards. The authorities could draw on the successful experience of the European Union in each of these areas.

With the establishment of a single market, the challenges associated with a new distributional system for customs and excise revenue would arise. Clearly, the current SACU revenue-sharing formula could no longer be applied, given the lack of reliable data on intra-SACU trade. Accordingly, the authorities could consider a move to regional funds, as discussed by Cuevas, Engstrom, Kramarenko, and Verdier in Chapter 3. Although transitional arrangements would be needed to prevent macroeconomic instability in the smaller members of SACU, these funds could be articulated along common regional objectives for infrastructure, energy, or transport needs. They could play a redistributional role from richer to poorer regions within SACU.

Finally, the establishment of a common monetary union within SACU would require strong political will to adopt a single currency. The recent experience in the euro area demonstrates that a monetary union demands strong commitment, particularly from the largest country in the union, to transcend national interests and to come to the aid of smaller countries in the event of fiscal or balance of payments problems. It also suggests the need for strong fiscal coordination, including the possible use of fiscal rules, as discussed by Basdevant in Chapter 4, to avoid the inflation bias that smaller countries may have within a monetary union. The evidence in Chapter 5 indicates that any added benefit for existing CMA countries to move to monetary union with a common central bank is questionable.
Despite being the oldest customs union in the world, the Southern African Customs Union (SACU) has often been criticized as a trade agreement benefiting its largest and most powerful member, South Africa, and being detrimental to its smaller members by hindering industrialization and inducing trade diversion. This chapter provides empirical evidence supporting the view that SACU has benefited all of its members and has outperformed other trade arrangements in Africa.

The chapter seeks to assess the extent to which SACU has expanded trade among member countries. It also assesses the impact of other trade agreements in Africa that can serve as benchmarks for SACU performance. The analysis estimates a gravity model of trade, which allows trade expansion, diversion, and creation to be separated. In models of this kind, bilateral trade between a pair of countries is explained by country-specific variables (e.g., size), pair-specific variables (e.g., shared border or language), and the presence of a trade agreement or a regional agreement to promote economic cooperation.

The quantitative literature on the impact of preferential trade agreements is extensive and can be divided into two groups. Ex ante studies focus on estimating the effect of a preferential trade agreement before it is put into place by using trade patterns and estimated elasticities in computable general equilibrium models. Ex post studies focus on analyzing bilateral trade flows after trade agreements have been put in place. The tool of choice in these papers—and in this chapter as

The authors would like to thank Vitaliy Kramarenko, participants in the IMF African Department seminar series, and other colleagues in the IMF and the World Bank for helpful comments.


well—is a gravity model of bilateral trade, which has become the workhorse model for analyzing bilateral trade.

Ex post studies draw on aggregate data as well as sector-level or commodity-level data. Aggregate bilateral trade data have been used to study the impact of preferential trade agreements (Frankel, 1997; Endoh, 1999; Krueger, 1999; Magee, 2008), currency unions (Rose, 2000; Rose and Van Wincoop, 2001; Frankel and Rose, 2002), and border effects (McCallum, 1995), as well as other historical or cultural influences on trade. Studies using more disaggregated data include Clausing (2001), who estimates the effect of the Canada-U.S. Free Trade Agreement, and Romalis (2005), who focuses on the North American Free Trade Agreement (NAFTA).

A number of studies analyze African trade. Foroutan and Pritchett (1993), with a focus on intra–sub-Saharan African trade, and Coe and Hoffmaister (1999), with greater emphasis on African trade with industrial countries, both find that the gravity model accurately predicts African bilateral trade patterns. Other papers sometimes reach different conclusions. Although they both estimate the impact of the Common Market for Eastern and Southern Africa (COMESA) on bilateral trade, Cernat (2001) finds evidence of trade creation, while Subramanian and Tamirisa (2001) suggest trade diversion. A more recent example is the work of Mayda and Steinberg (2007), who focus on Uganda’s commodity-level trade within COMESA and find that the trade agreement has not increased Uganda’s trade with member countries.

The analysis in this chapter is closest to the work of Carrère (2004). Using aggregate bilateral trade data, Carrère (2004) finds that trade agreements in Africa generated a significant increase in trade between 1962 and 1996 although initially often through trade diversion. In contrast to that study, this chapter offers an estimate of trade creation for SACU—which was not included in her study—and updates the estimation to 2008.

The gravity model estimated in this chapter provides evidence supporting the view that SACU has promoted trade:

• SACU outperforms other African regional trade agreements (RTAs). Although most African trade agreements are trade-creating, the magnitude of trade creation is much larger for SACU.

• Based on bilateral exports data, intra-SACU trade is 57 times higher than expected compared with a world reference, and 145 times higher than expected compared with an Africa-only sample. There is no evidence of export diversion but some evidence of import diversion, that is, part of the increase in intra-SACU trade has replaced imports from the rest of the world (ROW).

• Estimates based on bilateral imports data confirm the trade-creating effects of SACU membership, but the positive effects are smaller than in the data set of bilateral exports and, interestingly, these estimates do not confirm import diversion. That is, SACU has increased intra-SACU trade—and in particular imports to Botswana, Lesotho, Namibia, and Swaziland (BLNS)
from South Africa—but there is little evidence of imports from the ROW being crowded out.

To sum up, this analysis finds that the positive effects from trade expansion (increasing intra-SACU trade) are significant, whereas the negative effects from trade diversion are limited (or possibly zero). SACU has increased total intra-SACU trade and BLNS’s imports of goods from South Africa, but whether this has reduced BLNS’s imports from the ROW is questionable. This result provides important information to policymakers. Any future reform of the current SACU arrangements should ensure that the benefits of trade creation are increased.

The chapter is organized as follows: The next section reviews stylized facts about trade patterns within SACU and is followed by sections describing the chapter’s methodology and presenting the results. The final section offers concluding remarks.

TRADE PATTERNS WITHIN SACU

BLNS, except Swaziland, mainly export primary commodities to markets outside SACU, but South Africa has a significant market share in BLNS. About 70 percent of imports to BLNS originate from South Africa. From consumer durables to machinery and equipment, BLNS rely heavily on imports from South Africa, with little imports from outside SACU (see Figures 2.1 and 2.2).

Natural resource endowments (diamonds) and trade agreements that provide tariff preferences explain much of the export pattern of BLNS. About 90 percent of Botswana’s exports, dominated by diamonds, are destined to markets outside SACU. Namibia also exports diamonds, in addition to ores, printing materials, and fish, with about 70 percent of exports destined for markets outside SACU in 2005–08. A key reason for Lesotho’s export pattern is the African Growth and Opportunity Act that gives Lesotho preferential access to the U.S. market; its exports are dominated by garments exported to the United States. In total, 60 percent of Lesotho’s exports were headed to markets outside SACU during 2005–10. Swaziland’s export pattern is more closely linked with South Africa. Swaziland’s exports include processed and semiprocessed food products—such as sugar, soft drink concentrates, and canned fruits—and South Africa received about 50 percent of Swaziland’s exports in 2005–10.

Previous studies on SACU have been focused on cost- and consumer price-raising effects of tariffs. Flatters and Stern (2006) argue that a common external tariff escalates consumer prices. The gross cost-raising effect is the difference between prices faced in the presence of the tariff and those that would prevail in its absence. They estimate the associated probable welfare loss to be in the range of 2–10 percent of GDP for BLNS (Table 2.1). This estimate, however, ignores the impact of possible transportation costs, the fact that BLNS could have had their own tariffs in the absence of SACU, and the structural effects of SACU (e.g., trade diversion and trade creation).
Figure 2.1 Exports and Imports of BLNS
Source: IMF staff estimates.
Note: BLNS = Botswana, Lesotho, Namibia, and Swaziland.
Figure 2.2  Geographic Distribution of Exports of Goods (Percentage of the total value of exports)
Sources: Botswana Central Statistics Office; Central Bank of Lesotho; Lesotho Central Bureau of Statistics; UN Comtrade database; and IMF staff estimates.

TABLE 2.1
BLNS: Gross Cost-Raising Effects of SACU Tariffs in 2006

<table>
<thead>
<tr>
<th>Import of goods in 2006, f.o.b. (Millions of U.S. dollars)</th>
<th>Estimated cost-raising impact for 2006</th>
<th>Percentage of value of imports1</th>
<th>Millions of U.S. dollars2</th>
<th>Percentage of GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Probable Possible</td>
<td>Probable Possible</td>
<td>Probable Possible</td>
<td>Probable Possible</td>
</tr>
<tr>
<td>Botswana</td>
<td>3,053</td>
<td>9.2</td>
<td>14.8</td>
<td>281</td>
</tr>
<tr>
<td>Lesotho</td>
<td>1,469</td>
<td>9.6</td>
<td>16.6</td>
<td>141</td>
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<tr>
<td>Namibia</td>
<td>2,799</td>
<td>7.4</td>
<td>15.1</td>
<td>207</td>
</tr>
<tr>
<td>Swaziland</td>
<td>1,915</td>
<td>7.9</td>
<td>14.1</td>
<td>151</td>
</tr>
</tbody>
</table>
METHODOLOGY AND ESTIMATION ISSUES

Gravity models state that economic interactions between two countries are proportional to the size of these entities and inversely related to the distance between them. In addition to distance, gravity models also relate trade flows to country-specific characteristics, such as linguistic and cultural factors. Gravity models also estimate the effect of bilateral and RTAs on trade flows.

This chapter estimates variants of the following equation:

\[
\ln(x_{ijt}) = \beta_0 + \beta_1 \ln(Y_iY_j) + \beta_2 \ln\left(\frac{Y_iY_j}{P_iP_j}\right) + \beta_3 \ln(d_{ij}) + \beta_5 \ln\left(\text{Area}_i, \text{Area}_j\right) \\
+ \sum_i \beta_{RTA,ij} \text{RTA}_{ij} + \sum_i \beta_{RTA\_ROW,ij} \text{RTA\_ROW}_{ij} + \sum_i \beta_{ROW\_RTA,ij} \text{ROW\_RTA}_{ij} \\
+ \sum_i \beta_i D_{ij} + \epsilon_{ij} + u_{ij},
\]

in which \(x_{ijt}\) is bilateral trade (measured by exports or imports) between countries \(i\) and \(j\) at time \(t\), \(\beta\) are year effects, \(Y_i\) is real GDP in country \(i\), \(P_i\) is population in country \(i\), \(d_{ij}\) is the distance between countries \(i\) and \(j\), \(\text{Area}_i\) is country \(i\)’s area in square kilometers, \(\text{RTA}_{ij}\) is a dummy variable that is equal to 1 if countries \(i\) and \(j\) share a regional trade agreement at time \(t\), \(\text{RTA\_ROW}_{ij}\) is a dummy variable that is equal to 1 if the exporting country is a member of the RTA and 0 otherwise, \(\text{ROW\_RTA}_{ij}\) is a dummy variable that is equal to 1 if the importing country is a member of the RTA and 0 otherwise, and \(D_{ij}\) are time-invariant dummies that capture characteristics of the country pair (i.e., whether they share a common language or a border).

For this equation to be estimated successfully, a number of econometric issues must be addressed, including the treatment of zero-trade observations, non-linearities, omitted variables, and selection bias. These challenges and others are discussed in Appendix 2A. Of particular importance to this work are the choice of control variables, possible endogeneity, and the measurement of trade creation.

- **Controlling for country-pair characteristics.** Trade is more likely between countries with strong cultural and historical ties or trade arrangements. Following the literature, the analysis controls for whether countries share a common border, have had a colonial link, share a common language, and are a part of the same trade arrangement.

- **Controlling for monetary arrangements.** A large literature exists on the positive effects of currency unions on bilateral trade. In empirical studies, currency unions are usually controlled for by adding a 0–1 dummy variable. In many cases in Africa, however, membership in a currency union is indis-

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3 As noted in the introduction, this work is similar to Carrère (2004). For a more detailed discussion of estimation issues, see Appendix 2A, Methodology and Estimation Issues.

4 See Baldwin and Taglioni (2006) for a review of estimation issues relating to gravity equations.

5 A well-known example is Rose (2000).
tistinguishable from membership in an RTA (for example, SACU). The alternative here is to follow Carrère (2004) and use the volatility of the bilateral nominal exchange rate to control for the exchange rate regime. Volatility is defined as the standard deviation of the log change in the monthly bilateral nominal exchange rate.

• Dealing with endogeneity. As noted in the literature (e.g., see Krugman, 1991), countries may be “natural trading partners,” that is, countries with high bilateral trade flows will tend to form regional agreements. To deal with this endogeneity problem, a bilateral random effect (\( \varepsilon_{ij} \)) is introduced, which controls for unobserved factors that may explain bilateral trade (see Appendix 2A for more details).

• Measuring trade expansion, diversion, and creation. The gravity equation can be used to estimate the extent and magnitude of trade expansion, diversion, and creation. Trade expansion occurs when bilateral trade is higher for members of a trade arrangement (\( \beta_{RTA} > 0 \)). Trade diversion occurs when intra-bloc trade increases but trade with the ROW [imports (\( \beta_{ROW,RTA} < 0 \)) or exports (\( \beta_{RTA,ROW} < 0 \))] falls. There is trade creation if intra-bloc trade increases without reducing trade with the ROW or if trade expansion exceeds trade diversion. Following Magee (2008), counterfactuals from estimated coefficients of the gravity equations can be used to determine not only whether trade creation occurred but also its magnitude (see Appendix 2A for further details).

DATA

The quality of trade data for BLNS is low, with unreliable and often inconsistent numbers. To deal with this problem, the gravity models are estimated using two separate data sets for bilateral exports and bilateral imports, respectively:

• Bilateral exports data are taken from the IMF’s Direction of Trade Statistics (DOTS) database, which provides an unbalanced panel of exports in U.S. dollars for 150 countries and a total of 405,171 observations for the period 1990–2008. In the DOTS database, BLNS are treated as one group because of the lack of credible data for trade between each BLNS country and the ROW. However, the data for bilateral trade between the BLNS group and South Africa (intra-SACU trade) appear unreliable. This measurement problem is corrected by replacing intra-SACU trade with bilateral exports data from the UN Comtrade database, which provides trade data in U.S. dollars for 150 countries for the period 1962–2008.6

• Bilateral imports data are taken from the UN Comtrade database for the period 1990–2008. Import data tend to be more reliably reported because of the collection of import tariffs. SACU countries are also available as individual

---

6 This estimation only covers 1990–2008.
entities in the UN Comtrade database, which means that trade creation and
diversion can be estimated for individual countries in SACU. In this context,
it is important to note that imports data could overstate the BLNS group’s
reliance on imports from South Africa either because the country of origin is
not properly recorded or South African distributors are selling re-exported
goods previously imported to South Africa.

The control variables of interest are the dummy variables for RTAs from the
World Trade Organization’s database and include the East African Community
(EAC), the Economic Community of West African States (ECOWAS), the
Central African Economic and Monetary Community (CEMAC), COMESA,
SACU, the Southern African Development Community (SADC), and the West
African Economic and Monetary Union (WAEMU) for Africa, as well as the
European Union (EU), NAFTA, the Southern Common Market (MERCOSUR),
the Andean Community (a customs union comprising Bolivia, Colombia,
Ecuador, and Peru; ANDEAN), and the ASEAN Free Trade Area (AFTA).
Because African trade agreements are often overlapping, dummy variables for
African trade agreements are redefined to exclude overlapping effects. For exam-
ple, because all WAEMU countries are also members of ECOWAS, including
unmodified dummy variables for both would make it difficult to identify the
separate effects of these trade agreements. The ECOWAS dummy variable is
therefore redefined to exclude intra-WAEMU trade as well as trade between
WAEMU and non-ECOWAS countries. 7

Control variables are from (1) the World Bank’s World Development Indicators
for real GDP and population; (2) the IMF’s International Financial Statistics
for exchange rates; and (3) the Centre d’Etudes Prospectives et d’Informations
Internationales database for gravity variables (distance, area, country-pair charac-
teristics).

Because the DOTS database only contains data for BLNS as a group, adjust-
ments must be made to the control variables for BLNS. Each BLNS observation
is computed as the weighted average of individual country observations, with
population shares used as weights. For example, the distance between each BLNS
country and South Africa is the population-weighted average of the distances
between the capitals of South Africa and Botswana, Lesotho, Namibia, and
Swaziland.

RESULTS

Table 2.2 presents the results for bilateral exports from the DOTS database for three
samples: the full sample, non-Organization for Economic Cooperation and
Development (non-OECD) member countries, and African countries only. The
three samples provide three different reference points for evaluating the perfor-

7 For more details, see Appendix 2B, Sample Data and Sources.
mance of RTAs in Africa. In the full sample, African RTAs are evaluated against a world norm. The non-OECD sample excludes intra-OECD trade, that is, trade between advanced economies. Because trade between OECD countries is dominated by intra-industry trade, the non-OECD sample may be more appropriate for assessing SACU and African RTAs in general. Finally, the analysis evaluates African RTAs against an African norm in the Africa-only sample, which only includes intra-African trade and trade between Africa and the ROW. For each sample, two types of estimations are shown: the first uses standard random effects and the second uses the Hausman-Taylor instrumental variable method to deal with the potential correlation between random effects and some of the regressors. A Hausman test reveals a correlation between the bilateral random effects and $\ln(Y_iY_j)$ and $\ln\left(Y_iY_j/P_iP_j\right)$ justifying the use of the Hausman-Taylor method.

Let us consider the rationale for the gravity variables first. Larger countries (as measured by GDP) trade more, whereas greater distance tends to reduce bilateral trade. Country-pair characteristics matter: countries that share a common language, are contiguous, or share a common colonial past trade more. Because membership in a currency union is often indistinguishable from membership in a trade agreement, it is also important to separate their different effects on trade. As indicated above, the analysis controls for membership in a currency union by adding exchange rate volatility as an explanatory variable. As expected, exchange rate volatility reduces bilateral trade (which is consistent with the literature on estimating the impact of currency unions on trade) but only in the full sample; it does not appear to matter in the smaller samples.

How has SACU performed since 1990? SACU has a large positive effect on intra-SACU trade. The results also provide evidence of trade expansion in SADC, COMESA, EAC, ECOWAS, and WAEMU, but the largest expansion takes place within SACU. These estimates are converted into a measure of the additional trade by taking the exponential of individual estimated coefficients. Intra-SACU trade is more than 55 times higher [$= \exp(4.014)$, Table 2.2, column (2) for the full sample, and Table 2.4, column (1) for the full sample] than the expected level compared with a world reference, and 142 times higher [$= \exp(4.956)$, Table 2.2, column (6) and Table 2.4, column (3)] in the Africa-only sample. By contrast, intra-COMESA trade is only 1.3 times higher, intra-EAC trade is about 2–3 times higher, and intra-WAEMU trade is about 1.5–2 times higher than the norm [Table 2.4, columns (1)–(3)]. Surprisingly, there is only weak evidence of trade expansion in CEMAC and ECOWAS.

Trade expansion, however, is not direct evidence of trade creation if it is accompanied by substantial export and import diversion. Overall, these estimates do not suggest large levels of diversion ($\beta_{RTA,ROW}$ is small). Export diversion ranges from 0 to 10 percent in COMESA, ECOWAS, EAC, CEMAC, and WAEMU [Table 2.4, columns (1)–(3), based on estimates in Table 2.2]. For SACU, there is no evidence of export diversion, but the data do support some import diversion ($\beta_{ROW,RTA} < 0$).

---

*Although these results are not shown, the full-sample regressions also include controls for non-African RTAs: ASEAN, EU, MERCOSUR, and NAFTA.*

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### TABLE 2.2
Bilateral Exports Using the Direction of Trade Statistics Database

<table>
<thead>
<tr>
<th></th>
<th>Full sample</th>
<th>Non-OECD</th>
<th>Africa only</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td>Dependent variable: ln(1 + real exports)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(–25.94)</td>
<td>(–136.01)</td>
<td>(–22.28)</td>
</tr>
<tr>
<td>ln(distij)</td>
<td>–0.712***</td>
<td>–0.741***</td>
<td>–0.654***</td>
</tr>
<tr>
<td></td>
<td>(–15.80)</td>
<td>(–94.70)</td>
<td>(–13.40)</td>
</tr>
<tr>
<td>ln(YjYj)</td>
<td>0.564***</td>
<td>0.582***</td>
<td>0.502***</td>
</tr>
<tr>
<td></td>
<td>(27.72)</td>
<td>(168.04)</td>
<td>(23.46)</td>
</tr>
<tr>
<td>ln(\frac{Yj}{PP})</td>
<td>0.0339</td>
<td>0.00637</td>
<td>–0.00764</td>
</tr>
<tr>
<td></td>
<td>(1.37)</td>
<td>(1.18)</td>
<td>(–0.30)</td>
</tr>
<tr>
<td>Landlocked</td>
<td>–0.422***</td>
<td>–0.470***</td>
<td>–0.445***</td>
</tr>
<tr>
<td></td>
<td>(–7.21)</td>
<td>(–38.35)</td>
<td>(–7.29)</td>
</tr>
<tr>
<td>ln(Area, Areaj)</td>
<td>–0.0974***</td>
<td>–0.107***</td>
<td>–0.0879***</td>
</tr>
<tr>
<td></td>
<td>(–6.39)</td>
<td>(–39.96)</td>
<td>(–5.39)</td>
</tr>
<tr>
<td>Common language</td>
<td>0.352***</td>
<td>0.331***</td>
<td>0.315***</td>
</tr>
<tr>
<td></td>
<td>(3.78)</td>
<td>(20.50)</td>
<td>(3.43)</td>
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<tr>
<td>Contiguous</td>
<td>0.454</td>
<td>0.304***</td>
<td>0.496</td>
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<tr>
<td></td>
<td>(1.91)</td>
<td>(5.91)</td>
<td>(1.62)</td>
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<tr>
<td>Colony</td>
<td>1.690***</td>
<td>1.683***</td>
<td>2.123***</td>
</tr>
<tr>
<td></td>
<td>(6.15)</td>
<td>(32.29)</td>
<td>(5.85)</td>
</tr>
<tr>
<td>Total year</td>
<td>0.0244***</td>
<td>0.0268***</td>
<td>0.0246***</td>
</tr>
<tr>
<td></td>
<td>(4.54)</td>
<td>(12.88)</td>
<td>(5.00)</td>
</tr>
<tr>
<td>Entire year</td>
<td>–0.128**</td>
<td>–0.157***</td>
<td>–0.167***</td>
</tr>
<tr>
<td></td>
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<td>(–11.61)</td>
<td>(–4.09)</td>
</tr>
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<td>Difference_year</td>
<td>0.0139</td>
<td>0.0151</td>
<td>−0.0167</td>
</tr>
<tr>
<td>---------------------</td>
<td>----------</td>
<td>---------</td>
<td>-----------</td>
</tr>
<tr>
<td></td>
<td>(1.05)</td>
<td>(1.24)</td>
<td>(−1.34)</td>
</tr>
<tr>
<td>Volatility of exchange rate</td>
<td>−0.0257**</td>
<td>−0.0265**</td>
<td>−0.0123</td>
</tr>
<tr>
<td></td>
<td>(−3.03)</td>
<td>(−2.81)</td>
<td>(−1.04)</td>
</tr>
<tr>
<td>SACU</td>
<td>3.871***</td>
<td>4.014***</td>
<td>4.268***</td>
</tr>
<tr>
<td></td>
<td>(16.51)</td>
<td>(2.92)</td>
<td>(14.46)</td>
</tr>
<tr>
<td>SACU_ROW</td>
<td>0.545*</td>
<td>0.592***</td>
<td>0.504*</td>
</tr>
<tr>
<td></td>
<td>(2.31)</td>
<td>(12.48)</td>
<td>(2.46)</td>
</tr>
<tr>
<td>ROW_SACU</td>
<td>−0.0917</td>
<td>−0.0430</td>
<td>−0.231</td>
</tr>
<tr>
<td></td>
<td>(−0.40)</td>
<td>(−0.97)</td>
<td>(−1.18)</td>
</tr>
<tr>
<td>SADC</td>
<td>0.265</td>
<td>0.246***</td>
<td>0.294</td>
</tr>
<tr>
<td></td>
<td>(1.60)</td>
<td>(4.08)</td>
<td>(1.76)</td>
</tr>
<tr>
<td>SADC_ROW</td>
<td>0.0548</td>
<td>0.0498***</td>
<td>0.0465</td>
</tr>
<tr>
<td></td>
<td>(1.05)</td>
<td>(3.57)</td>
<td>(0.99)</td>
</tr>
<tr>
<td>ROW_SADC</td>
<td>0.182***</td>
<td>0.177***</td>
<td>0.182***</td>
</tr>
<tr>
<td></td>
<td>(3.47)</td>
<td>(12.67)</td>
<td>(3.74)</td>
</tr>
<tr>
<td>COMESA</td>
<td>0.244***</td>
<td>0.253***</td>
<td>0.247***</td>
</tr>
<tr>
<td></td>
<td>(3.01)</td>
<td>(7.49)</td>
<td>(3.34)</td>
</tr>
<tr>
<td>COMESA_ROW</td>
<td>−0.120**</td>
<td>−0.116***</td>
<td>−0.0508</td>
</tr>
<tr>
<td></td>
<td>(−3.09)</td>
<td>(−9.15)</td>
<td>(−1.33)</td>
</tr>
<tr>
<td>ROW_COMESA</td>
<td>0.219***</td>
<td>0.223***</td>
<td>0.207***</td>
</tr>
<tr>
<td></td>
<td>(5.79)</td>
<td>(17.43)</td>
<td>(5.39)</td>
</tr>
<tr>
<td>ECOWAS</td>
<td>0.314*</td>
<td>0.273***</td>
<td>0.102</td>
</tr>
<tr>
<td></td>
<td>(2.16)</td>
<td>(4.19)</td>
<td>(1.08)</td>
</tr>
<tr>
<td>ECOWAS_ROW</td>
<td>−0.130</td>
<td>−0.155***</td>
<td>−0.121</td>
</tr>
<tr>
<td></td>
<td>(−1.87)</td>
<td>(−9.75)</td>
<td>(−1.85)</td>
</tr>
<tr>
<td>ROW_ECOWAS</td>
<td>0.188***</td>
<td>0.164***</td>
<td>0.125*</td>
</tr>
<tr>
<td></td>
<td>(2.89)</td>
<td>(11.21)</td>
<td>(1.98)</td>
</tr>
<tr>
<td></td>
<td>(3.13)</td>
<td>(6.59)</td>
<td>(3.48)</td>
</tr>
</tbody>
</table>

(continued)
## TABLE 2.2 (continued)

### Bilateral Exports Using the Direction of Trade Statistics Database

<table>
<thead>
<tr>
<th></th>
<th>Full sample</th>
<th>Non-OECD</th>
<th>Africa only</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td>Dependent variable: ln(1 + real exports)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EAC</td>
<td>0.799**</td>
<td>0.820***</td>
<td>0.879***</td>
</tr>
<tr>
<td></td>
<td>(3.13)</td>
<td>(6.59)</td>
<td>(3.48)</td>
</tr>
<tr>
<td>EAC_ROW</td>
<td>−0.156*</td>
<td>−0.149***</td>
<td>−0.124</td>
</tr>
<tr>
<td></td>
<td>(−2.38)</td>
<td>(−7.84)</td>
<td>(−1.91)</td>
</tr>
<tr>
<td>ROW_EAC</td>
<td>−0.0119</td>
<td>−0.00416</td>
<td>−0.00989</td>
</tr>
<tr>
<td></td>
<td>(−0.18)</td>
<td>(−0.22)</td>
<td>(−0.14)</td>
</tr>
<tr>
<td>CEMAC</td>
<td>−0.0455</td>
<td>−0.0215</td>
<td>−0.0291</td>
</tr>
<tr>
<td></td>
<td>(−0.17)</td>
<td>(−0.19)</td>
<td>(−0.12)</td>
</tr>
<tr>
<td>CEMAC_ROW</td>
<td>−0.0656</td>
<td>−0.0590**</td>
<td>−0.112</td>
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<tr>
<td></td>
<td>(−0.90)</td>
<td>(−3.00)</td>
<td>(−1.78)</td>
</tr>
<tr>
<td>ROW_CEMAC</td>
<td>−0.0148</td>
<td>−0.00773</td>
<td>−0.0202</td>
</tr>
<tr>
<td></td>
<td>(−0.20)</td>
<td>(−0.39)</td>
<td>(−0.32)</td>
</tr>
<tr>
<td>WAEMU</td>
<td>0.832*</td>
<td>0.766***</td>
<td>0.647</td>
</tr>
<tr>
<td></td>
<td>(2.16)</td>
<td>(7.67)</td>
<td>(1.73)</td>
</tr>
<tr>
<td>WAEMU_ROW</td>
<td>−0.0299</td>
<td>−0.0538***</td>
<td>−0.00673</td>
</tr>
<tr>
<td></td>
<td>(−0.44)</td>
<td>(−3.51)</td>
<td>(−0.10)</td>
</tr>
<tr>
<td>ROW_WAEMU</td>
<td>0.169*</td>
<td>0.144***</td>
<td>0.0943</td>
</tr>
<tr>
<td></td>
<td>(1.97)</td>
<td>(6.25)</td>
<td>(2.13)</td>
</tr>
<tr>
<td>Observations</td>
<td>375,054</td>
<td>375,054</td>
<td>284,243</td>
</tr>
<tr>
<td>Year effects</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Cluster country pair</td>
<td>yes</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Random effects</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Hausman-Taylor</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
</tr>
</tbody>
</table>

Source: IMF staff.

Note: CEMAC = Central African Economic and Monetary Community; COMESA = Common Market for Eastern and Southern Africa; EAC = East African Community; ECOWAS = Economic Community of West African States; ROW = rest of the world; SACU = Southern African Customs Union; SADC = Southern African Development Community; WAEMU = West African Economic and Monetary Union. These regressions also include country-specific and country-pair characteristics as well as dummies for trade agreements in non-African countries. In some regressions (“cluster country pair”), the standard errors are computed assuming zero correlation across groups but allow a non-zero within-cluster or within-country-pair correlation. t-statistics are in parentheses. * , ** , and *** denote significance at the 5 percent, 1 percent, and 0.1 percent levels of confidence.
# TABLE 2.3

Bilateral Imports Using UN Comtrade Database

<table>
<thead>
<tr>
<th></th>
<th>Full sample</th>
<th>Non-OECD</th>
<th>Africa only</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td>Dependent variable: (\ln(1 + \text{real imports}))</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>(-25.61^{***})</td>
<td>(-25.60^{***})</td>
<td>(-24.75^{***})</td>
</tr>
<tr>
<td></td>
<td>((-67.94))</td>
<td>((-67.93))</td>
<td>((-54.49))</td>
</tr>
<tr>
<td>(\ln(dist_{ij}))</td>
<td>(-1.251^{***})</td>
<td>(-1.251^{***})</td>
<td>(-1.219^{***})</td>
</tr>
<tr>
<td></td>
<td>((-60.04))</td>
<td>((-60.05))</td>
<td>((-47.67))</td>
</tr>
<tr>
<td>(\ln(Y_iY_j))</td>
<td>(1.064^{***})</td>
<td>(1.064^{***})</td>
<td>(0.992^{***})</td>
</tr>
<tr>
<td></td>
<td>((103.41))</td>
<td>((103.42))</td>
<td>((73.25))</td>
</tr>
<tr>
<td>(\ln\left(\frac{Y_iY_j}{PP_i}\right))</td>
<td>(0.109^{***})</td>
<td>(0.109^{***})</td>
<td>(0.167^{***})</td>
</tr>
<tr>
<td></td>
<td>((6.64))</td>
<td>((6.64))</td>
<td>((8.19))</td>
</tr>
<tr>
<td>Landlocked</td>
<td>(-0.496^{***})</td>
<td>(-0.495^{***})</td>
<td>(-0.301^{***})</td>
</tr>
<tr>
<td></td>
<td>((-15.79))</td>
<td>((-15.77))</td>
<td>((-7.83))</td>
</tr>
<tr>
<td>(\ln(Area_i\times Area_j))</td>
<td>(-0.184^{***})</td>
<td>(-0.184^{***})</td>
<td>(-0.136^{***})</td>
</tr>
<tr>
<td></td>
<td>((-23.61))</td>
<td>((-23.61))</td>
<td>((-13.49))</td>
</tr>
<tr>
<td>Common language</td>
<td>(0.816^{***})</td>
<td>(0.816^{***})</td>
<td>(0.761^{***})</td>
</tr>
<tr>
<td></td>
<td>((19.19))</td>
<td>((19.19))</td>
<td>((15.50))</td>
</tr>
<tr>
<td>Contiguous</td>
<td>(0.205)</td>
<td>(0.197)</td>
<td>(0.445^{**})</td>
</tr>
<tr>
<td></td>
<td>((1.72))</td>
<td>((1.65))</td>
<td>((2.89))</td>
</tr>
<tr>
<td>Colony</td>
<td>(1.254^{***})</td>
<td>(1.252^{***})</td>
<td>(1.016^{***})</td>
</tr>
<tr>
<td></td>
<td>((11.01))</td>
<td>((10.99))</td>
<td>((6.13))</td>
</tr>
<tr>
<td>Total year</td>
<td>(0.0526^{***})</td>
<td>(0.0526^{***})</td>
<td>(0.0783^{***})</td>
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<tr>
<td></td>
<td>((24.48))</td>
<td>((24.50))</td>
<td>((29.25))</td>
</tr>
<tr>
<td>Entire year</td>
<td>(0.0704^{***})</td>
<td>(0.0702^{***})</td>
<td>(0.306^{***})</td>
</tr>
<tr>
<td></td>
<td>((4.08))</td>
<td>((4.07))</td>
<td>((11.94))</td>
</tr>
<tr>
<td>Difference_year</td>
<td>(0.454^{***})</td>
<td>(0.454^{***})</td>
<td>(0.408^{***})</td>
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Source: IMF staff.

Note: BLNS = Botswana, Lesotho, Namibia, and Swaziland; CEMAC = Central African Economic and Monetary Community; COMESA = Common Market for Eastern and Southern Africa; EAC = East African Community; ECOWAS = Economic Community of West African States; SACU = Southern African Customs Union; SADC = Southern African Development Community; ROW = rest of the world; WAEMU = West African Economic and Monetary Union; ZAF = imports from South Africa. These regressions also include country-specific and country-pair characteristics as well as dummies for trade agreements in non-African countries. In some regressions ("cluster country pair"), the standard errors are computed assuming zero correlation across groups but allow a non-zero within-cluster or within-country-pair correlation. t-statistics are in parentheses. *, **, and *** denote significance at the 5 percent, 1 percent, and 0.1 percent levels of confidence.
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Source: IMF staff.

Note: CEMAC = Central African Economic and Monetary Community; COMESA = Common Market for Eastern and Southern Africa; DOTS = Direction of Trade Statistics; EAC = East African Community; ECOWAS = Economic Community of West African States; OECD = Organization for Economic Cooperation and Development; SACU = Southern African Customs Union; SADC = Southern African Development Community; WAEMU = West African Economic and Monetary Union. Trade expansion and diversion are computed using significant coefficients. When the coefficient is insignificant, the expansion/diversion magnitude is zero.
in the restricted samples; for example, imports from the ROW are 30 percent lower than the norm in the Africa-only sample. There is also evidence of import diversion for EAC countries, 10 percent below the norm in the Africa-only sample.

Table 2.3 presents the results using bilateral imports from the UN Comtrade database. Arguably, these data are more reliable because country authorities must collect import tariffs and might therefore better track their imports. As noted previously, gravity variables have the expected signs. The analysis also controls for the volatility of the exchange rate and infrastructure. In contrast with the previous data set, exchange rate volatility does not reduce bilateral trade. The negative effects from volatility could possibly be picked up by random effects.

Estimates based on the second data set reconfirm the previous finding that most RTAs in Africa have expanded trade. However, the results are not fully robust to the change in the data source (e.g., the benefits of EAC membership are no longer visible). The large estimated effect of SACU membership in the first data set is now significantly reduced and only present in the Africa-only sample.

Let us consider the SACU results a bit more closely. The public debate in SACU has often focused on the claim that there is a negative polarization impact on BLNS from being in a customs union with a much larger and more developed economy. However, in the Africa-only sample, the analysis estimates that SACU has a large positive effect on intra-SACU trade (β_{SACU} > 0) without reducing trade with the ROW. This suggests that BLNS would have had close trade links with South Africa even in the absence of SACU, given the size of the South African economy, its proximity, the commonality of language, and other independent variables. In other words, trade diversion has been minimal, whereas trade expansion has been large, particularly relative to the African norm. Consequently, any possible negative externalities could be related to the fact that BLNS are in the periphery of a strong core (South Africa) rather than to the impact of SACU itself (see, for example, Ramcharan, 2009).

A closer inspection indicates that the gains from SACU come mainly from trade between South Africa and BLNS—and not from trade among BLNS. The effect of separate trade flows is estimated by replacing the SACU dummy variable with three variables: South African imports from the BLNS (ZAF_BLNS), BLNS imports from South Africa (BLNS_ZAF), and intra-BLNS trade (BLNS). As shown in Table 2.3, columns (2), (4), and (6), BLNS countries do trade more with South Africa, but no evidence indicates that this has reduced trade from the ROW.

Table 2.4 summarizes all results and the implied magnitude of trade creation, providing reliable evidence of trade creation for SACU, SADC, COMESA,

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9 This could be the result of dynamic effects. The EAC customs union was officially launched in 2005 but allowed for a five-year transition during which member states could maintain internal tariffs on certain sensitive products.

10 The numbers in Table 2.4 are computed using columns (2), (4), and (6) in Tables 2.2 and 2.3. Trade effects are computed as $e^{\hat{\beta}}$ if $\hat{\beta} > 0$ and $1 - e^{\hat{\beta}}$ if $\hat{\beta} < 0$, where $\hat{\beta}$ is the estimated coefficient. Note that in the DOTS database, the import diversion coefficient is the coefficient on $ROW_{RTA}$ and export diversion corresponds to $RTA_{ROW}$. The reverse is true for the UN Comtrade database.
ECOWAS, and WAEMU. The evidence for EAC, and particularly for CEMAC, is weaker, and not robust to the change in database. SACU appears to outperform other RTAs in Africa, although this result is muted in the UN Comtrade samples.

The magnitude of the SACU effect can be presented by graphing trade creation across time, as suggested by Magee (2008).

Figure 2.3 presents four panels

---

**Figure 2.3** Southern African Customs Union: Trade Creation, 2000–07
Source: IMF staff estimates.

Note: BLNS = Botswana, Lesotho, Namibia, and Swaziland; SACU = Southern African Customs Union.

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11 We estimate a regression similar to column 1 in Table 2.2. Setting $RTA_i$, $RTA_ROW$, and $ROW_{RTA_i}$ to zero gives an estimate of the level of bilateral exports in the absence of the RTA. Details about the measure of trade expansion using the Magee methodology are given in Appendix 2A.
representing (1) trade creation in nominal levels; (2) trade creation as a percentage of own counterfactual exports without SACU (that is, the sum of predicted intra-SACU exports in the absence of SACU, and exports to the ROW in the absence of SACU); (3) trade creation as a percentage of total exports; and (4) trade creation as a percentage of predicted intra-SACU exports in the absence of SACU. The panels show that, although South Africa gains more in nominal levels, BLNS appear to gain more using alternative measures.

A number of caveats should be noted. First, it is possible that the analysis has not fully eliminated the possible endogeneity between bilateral trade and regional agreements and, if so, part of the estimated coefficients would reflect a correlation rather than a causal link. Second, the positive effect of bilateral trade agreements is most likely dynamic and growing over time as institutions are set up to deal with the demands of increased trade. This may explain, in part, the overperformance of the SACU arrangement: SACU is the oldest customs union in Africa and has well-established institutions that support trade. Third, compared with other customs unions, SACU member countries may have more incentives to report bilateral trade. Revenue sharing among SACU members is, in part, based on bilateral trade data, and members receive a higher share of collected revenues the higher their share of bilateral trade. Informal, unrecorded bilateral trade is therefore likely to be less of a problem than in other parts of Africa. Nevertheless, robust results for SACU across databases support the view that SACU membership seems to have promoted trade creation.

CONCLUSION

The analysis presented in this chapter finds that the SACU members have benefited from trade integration induced by SACU. The positive effects from trade expansion (increasing intra-SACU trade) are significant, whereas the negative effects from trade diversion are limited (or possibly zero).

Using two separate databases and measures of trade, the chapter finds solid evidence of trade creation, net of any potential trade diversion. Compared with a world reference based on bilateral exports data, intra-SACU trade is 57 times higher than expected. Compared with an Africa-only reference based on bilateral imports data, intra-SACU trade is 9 times higher than expected. Furthermore, South Africa has gained more from trade creation than BLNS if measured in nominal levels, but BLNS have gained more from trade creation measured in percentage of counterfactual exports without SACU.

The results in this chapter have implications for the ongoing discussion about how to reform SACU and its revenue-sharing formula. Trade creation has benefited all SACU members and future reforms should, therefore, support greater integration and not introduce new barriers to trade. Even if the evidence of trade diversion is unclear, a case for compensatory transfers can still be made if the structure of the common external tariff decidedly benefits one member of a cus-

---

12 SACU members may even have an incentive to over-report their bilateral trade.
The benefits of trade integration in the Southern African Customs Union
toms union at the expense of other members. For example, a significant proportion of SACU import tariffs are collected on automobiles, an industry almost entirely based in South Africa. BLNS could, therefore, make legitimate claims that they should be compensated for extra-normal profits earned by South African automobile producers as a result of the common external tariff.

The chapter’s results cast doubt on the proposal to allocate customs revenues according to the final destination principle. Such a mechanism for revenue allocation would require establishing capacity for tracking and collecting revenues by country of final destination. It may, therefore, result in the erection of stricter fiscal frontiers between members and increase the cost of doing business and discourage intra-SACU trade. Stricter fiscal frontiers would be detrimental to the welfare of all SACU members.
APPENDIX 2A. METHODOLOGY AND ESTIMATION ISSUES

This chapter estimates a variant of the following equation:

\[
\ln(x_{ij}) = \beta_0 + \beta_1 \ln(Y_i) + \beta_2 \ln(Y_j) + \beta_3 \ln(P_i) + \beta_4 \ln(P_j) + \beta_5 \ln(dist_{ij}) \\
+ \sum_i \beta_i RTA_{ij} + \sum_i \beta_i D_{ij} + u_{ij},
\]

in which \(x_{ij}\) is bilateral trade (measured by exports or imports) between countries \(i\) and \(j\) at time \(t\), \(Y_i\) is real GDP in country \(i\), \(P_i\) is population in country \(i\), \(dist_{ij}\) is the distance between countries \(i\) and \(j\), \(RTA_{ij}\) is a dummy variable that is equal to 1 if countries \(i\) and \(j\) share a trade agreement at time \(t\), and \(D_{ij}\) are time-invariant dummies that capture characteristics of the country pair (i.e., whether they share a common language or a border). 13

A number of econometric issues must be addressed for this equation to be estimated successfully (see Baldwin and Taglioni, 2006, for a review of estimation issues relating to gravity equations):

- Inappropriate deflation. Bilateral trade is in current U.S. dollars and must be deflated by a U.S. aggregate price index to obtain volumes. Such deflation, however, may create spurious correlations because there are global trends in inflation rates. The analysis follows Rose (2000) and others by adding time dummies to adjust for global trends in inflation rates.

- Zero-trade observations. There are many zero observations for bilateral trade. The literature considered two options for dealing with them. One alternative is to assume that these observations are random measurement errors and drop them from the sample. Another option is to treat these observations as true values and transform the data so that they can be used in the estimation. The transformation \(\log(1 + \text{exports})\) is used here. Note that these observations may not be random, which would preferably require the use of censored data methods.

- Nonlinearities. There may be nonlinearities in the relationship between bilateral trade and macroeconomic variables. These nonlinearities are captured by using a parsimonious quadratic specification:

\[
\ln(x_{ij}) = \beta_0 + \beta_1 + \beta_1 \ln(Y_i) + \beta_2 \ln\left(\frac{Y_j}{P_i}\right) + \beta_3 \ln(dist_{ij}) \\
+ \beta_4 \ln\left(\text{Area}_i \text{Area}_j\right) + \sum_i \beta_i \text{RTA}_{ij} + \sum_i \beta_i D_{ij} + u_{ij},
\]

- Omitted variables. Countries with strong ties are likely to trade more and are more likely to form trade unions. Thus, the error term is correlated with...
the trade agreement dummy. This can be controlled for to some extent by introducing dummies that capture cultural and historical ties (common language and the like), but it is difficult to control for all those effects. Country-pair fixed effects can be introduced, which will capture the impact on trade of factors that do not change over time (distance, land area, cultural ties, and so on). Introducing country-pair fixed effects would normally require the removal of variables, such as distance and common border, that are time invariant. The analysis, therefore, models these country-pair effects \( \epsilon_{ij} \) as random variables:

\[
\ln(x_{ij}) = \beta_0 + \beta_1 \ln(Y_i) + \beta_2 \ln(Y_j) + \beta_3 \ln(P_i) + \beta_4 \ln(P_j) + \beta_5 \ln(dist) + \sum \beta_{ij} RTA_{ij} + \sum \beta_{ij} D_{ij} + \epsilon_{ij} + u_{ij}
\]

Note that some time-varying macroeconomic variables may be correlated with random effects. One way to deal with this issue is to use the Hausman and Taylor (1981) instrumental variable technique, which uses exogenous time-varying regressors from periods other than the current as instruments.\(^{14}\)

- Selection bias. Because the panel is unbalanced, a selection bias may be associated with the presence of a country pair in the sample. To correct for this potential, the analysis follows Nijman and Verbeek (1992) and adds three variables: the number of years a country pair has been present in the sample (total year), one dummy that is equal to 1 if the country pair is in the sample for the entire period (entire year), and another dummy that is equal to 1 if the country pair was present at \( t - 1 \) (difference_year).

- Predicting bilateral trade. As discussed below, the estimation results will be used to compute predicted trade and various counterfactuals. Wooldridge (2006) discusses two ways of obtaining consistent predictions for the left-hand-side variable when it is expressed in logs. That method is used here, giving the most accurate prediction for trade. The predicted level of trade is \( \hat{x} = \alpha_0 e^{\log(\alpha)} \) where \( \alpha_0 \) is the coefficient in a linear regression (without an intercept) of \( x \) on \( \log(x) \) and \( \log(\hat{x}) \) is the fitted value from the regression of \( \ln(x_{ij}) \) on all the right-hand-side variables.

- Controlling for currency unions. A large literature exists on the positive effects of currency unions on bilateral trade (a well-known example is Rose, 2000). In empirical papers, currency unions are usually controlled for by adding a 0–1 dummy variable. In many cases in Africa, however, membership in a currency union is indistinguishable from membership in an RTA

\(^{14}\) Let \( X = [X_1, X_2] \) be a matrix of time-varying dependent variables, where \( X_1 \) is exogenous and \( X_2 \) is endogenous, and \( Z \) denotes a matrix of time-invariant dependent variables. The appropriate matrix of instruments is \( [QX_1, QX_2, PX, Z] \) where \( Q \) is a matrix that obtains deviations from individual means and \( P \) averages observations across time for each country.
Engstrom and Verdier

(e.g., SACU). The alternative is to follow Carrère (2004) and use the volatility of the bilateral nominal exchange rate to control for the exchange rate regime. Volatility is defined as the standard deviation of the log change in the monthly bilateral nominal exchange rate.

- Controlling for infrastructure. Although the analysis uses the traditional gravity model assumption that transport costs are captured by distance, there is evidence that this variable captures only a small fraction of overall transport costs (Limao and Venables, 2001). Infrastructure, for example, the communication and transportation network, should be an important determinant of transport costs, and ultimately bilateral trade. The analysis follows Limao and Venables (2001) and Carrère (2004) and measures infrastructure as the average of the density of paved roads, railway, and the number of telephone lines per capita.

- Measuring trade expansion, diversion, and creation. The gravity equation can be used to estimate the extent and magnitude of trade diversion. Following Carrère (2004), the analysis estimates the following equation:

\[
\ln(x_{ij}) = \beta_0 + \beta_1 \ln(Y_Y) + \beta_2 \ln\left(\frac{Y_Y}{P_j}\right) + \beta_3 \ln(dist_{ij}) + \beta_4 \ln(\text{Area}, \text{Area}_j) + \sum_i \beta_{RTA-ROW}^{RTA-ROW} + \sum_i \beta_{ROW-RTA}^{ROW-RTA} + \sum_i \beta_iD_i + \epsilon_{ij} + \mu_{ij},
\]

in which

- RTA_ROW is equal to 1 if the exporting country is a member of an RTA and the importing country is from the ROW, 0 otherwise.
- ROW_RTA is equal to 1 if the exporting country is from the ROW and the importing country is a member of an RTA.

Trade expansion, diversion, and creation can be defined as follows when the dependent variable is exports:

- Trade expansion: \(\beta_{RTA} > 0\).
- Trade creation: \(\beta_{RTA} > 0\) and \(\beta_{RTA-ROW} = 0\), that is, intra-bloc trade increases without reducing exports to the ROW.
- Import diversion: \(\beta_{RTA} > 0\) and \(\beta_{ROW-RTA} < 0\), that is, intra-bloc trade increases but imports from the ROW fall.
- Export diversion: \(\beta_{RTA} > 0\) and \(\beta_{RTA-ROW} < 0\), that is, intra-bloc trade increases but exports to the ROW fall.

The magnitude of trade creation can also be estimated (see Magee, 2008). Trade expansion is associated with increases in intra-bloc trade above the trade level that would have occurred within the trading bloc in the absence of an agreement. Setting \(RTA_{ij}\), \(RTA_{ROW}\), and \(RTA_{RTA}\) to zero gives an estimate of the level of bilateral exports in the absence of the RTA. Then trade expansion can be defined as:
The Benefits of Trade Integration in the Southern African Customs Union

\[ T_{RTA}^{RTA} = \begin{cases} x_{RTA}^{RTA} - x_{RTA}^{\neq RTA} & \text{if } x_{RTA}^{RTA} \geq x_{RTA}^{\neq RTA} \\ 0 & \text{if } x_{RTA}^{RTA} < x_{RTA}^{\neq RTA} \end{cases}, \]

in which

\[ x_{RTA}^{RTA} = \sum_{i \in RTA} x_{ij}^{RTA}, \]

is country j’s total exports from other countries within the RTA, and

\[ x_{RTA}^{\neq RTA} = \sum_{i \in RTA} x_{ij}^{\neq RTA}, \]

is the predicted level of exports from other countries in the RTA in the absence of the RTA.

Trade diversion is implied if the rise in intra-bloc trade is accompanied by a decline in extra-bloc trade:

\[ \begin{cases} T_{RTA}^{RTA} & \text{if } \hat{x}_{j}^{\neq RTA} - x_{j}^{\neq RTA} \geq T_{RTA}^{SRTA} \\ 0 & \text{if } \hat{x}_{j}^{\neq RTA} - x_{j}^{\neq RTA} < 0 \end{cases} \]

in which

\[ x_{j}^{\neq RTA} = \sum_{i \notin RTA} x_{ij}^{\neq RTA}, \]

is country j’s total exports from other countries outside of the RTA, and

\[ \hat{x}_{j}^{\neq RTA} = \sum_{i \notin RTA} \hat{x}_{ij}^{\neq RTA}, \]

is the predicted level of exports from other countries outside of the RTA if it had not been signed.

Trade creation is occurring if part of the increase in intra-bloc trade is not offset by a decline in extra-bloc trade:

\[ T_{j}^{RTA} = T_{j}^{RTA} + T_{RTA}^{SRTA}. \]

APPENDIX 2B. SAMPLE DATA AND SOURCES

<table>
<thead>
<tr>
<th>Sample of Countries</th>
<th>Sample of Countries</th>
<th>Sample of Countries</th>
<th>Sample of Countries</th>
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<td>Bangladesh</td>
<td>Haiti</td>
<td>Portugal</td>
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<td>China</td>
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<td>Congo, Dem. Rep. of</td>
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<td>Congo, Republic of</td>
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<td>Fiji</td>
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<td>Finland</td>
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<td>France</td>
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<td>Gabon</td>
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<td>Gambia, The</td>
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**TABLE 2B.2**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Definition</th>
<th>Sources</th>
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</thead>
<tbody>
<tr>
<td>Nominal exports</td>
<td>Bilateral nominal exports (millions of U.S. dollars)</td>
<td>DOTS</td>
</tr>
<tr>
<td>Real exports</td>
<td>Bilateral nominal exports deflated by U.S. CPI</td>
<td>Authors’ calculation</td>
</tr>
<tr>
<td>Nominal imports</td>
<td>Bilateral nominal imports (millions of U.S. dollars)</td>
<td>UN Comtrade database</td>
</tr>
<tr>
<td>Real imports</td>
<td>Bilateral nominal imports deflated by U.S. CPI</td>
<td>Authors’ calculation</td>
</tr>
<tr>
<td>U.S. CPI</td>
<td>U.S. consumer price index</td>
<td>IFS</td>
</tr>
<tr>
<td>Real GDP</td>
<td>Gross domestic product, constant international dollars</td>
<td>WDI</td>
</tr>
<tr>
<td>Population</td>
<td>Population</td>
<td>WDI</td>
</tr>
<tr>
<td>Volatility</td>
<td>Standard deviation of the log change in the monthly bilateral nominal exchange rate</td>
<td>IFS and authors’ calculation</td>
</tr>
</tbody>
</table>

(continued)
<table>
<thead>
<tr>
<th>Variable</th>
<th>Definition</th>
<th>Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance</td>
<td>Geodesic distance between largest cities</td>
<td>CEPII</td>
</tr>
<tr>
<td>Area</td>
<td>Area in kilometers squared</td>
<td>CEPII</td>
</tr>
<tr>
<td>Landlocked</td>
<td>=1 if the country is landlocked, 0 otherwise</td>
<td>CEPII</td>
</tr>
<tr>
<td>Locked</td>
<td>=landlocked, + landlocked</td>
<td>Authors’ calculation</td>
</tr>
<tr>
<td>Contiguous</td>
<td>=1 if the two countries are contiguous, 0 otherwise</td>
<td>CEPII</td>
</tr>
<tr>
<td>Colony</td>
<td>=1 if the two countries ever had a colonial link, 0 otherwise</td>
<td>CEPII</td>
</tr>
<tr>
<td>Common</td>
<td>=1 if the two countries share a common official language, 0 otherwise</td>
<td>CEPII</td>
</tr>
<tr>
<td>SACU_ijk</td>
<td>=1 if both countries i and j are members of the Southern African Customs Union, 0 otherwise</td>
<td>WTO and authors’ calculation</td>
</tr>
<tr>
<td>ZAF_BLNS</td>
<td>=1 if exporting country is South Africa and importing country is BLNS, 0 otherwise in DOTS data; =1 if importing country is South Africa and exporting country is BLNS, 0 otherwise in UN Comtrade data</td>
<td>Authors’ calculation</td>
</tr>
<tr>
<td>BLNS_ZAF</td>
<td>=1 if exporting country is BLNS and importing country is South Africa, 0 otherwise in DOTS data; =1 if importing country is BLNS and exporting country is South Africa, 0 otherwise in UN Comtrade data</td>
<td>Authors’ calculation</td>
</tr>
<tr>
<td>SADC_ijk</td>
<td>=1 if countries i and j are members of the Southern African Development Community and neither country i nor j is a member of SACU, 0 otherwise.</td>
<td>WTO and authors’ calculation</td>
</tr>
<tr>
<td>SADC_ROW_ijk</td>
<td>=1 if exporting country (importing) is a member of SADC in DOTS database (UN Comtrade database), 0 otherwise</td>
<td>WTO and authors’ calculation</td>
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<tr>
<td>ROW_SADC_ijk</td>
<td>=1 if exporting (importing) country is a member of SADC in DOTS database (UN Comtrade database), 0 otherwise</td>
<td>WTO and authors’ calculation</td>
</tr>
<tr>
<td>COMESA_ijk</td>
<td>=1 if countries i and j are members of the Common Market for Eastern and Southern Africa, neither country i nor j is a member of SADC, and neither country i nor j is a member of EAC, 0 otherwise.</td>
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<td>COMESA_ROW_ijk</td>
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<td>ROW_COMESA_ijk</td>
<td>=1 if exporting (importing) country is a member of COMESA in DOTS database (UN Comtrade database), 0 otherwise</td>
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</tr>
<tr>
<td>ECOWAS_ijk</td>
<td>=1 if both countries i and j are members of the Economic Community of West African States and neither country i nor j is a member of WAEMU, 0 otherwise</td>
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<tr>
<td>ECOWAS_ROW_ijk</td>
<td>=1 if exporting country (importing) is a member of ECOWAS in DOTS database (UN Comtrade database), 0 otherwise</td>
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<td>=1 if exporting (importing) country is a member of ECOWAS in DOTS database (UN Comtrade database), 0 otherwise</td>
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</table>
TABLE 2B.2 (Continued)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Definition</th>
<th>Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>EAC(_{ij})</td>
<td>=1 if both countries (i) and (j) are members of the East African Community, 0 otherwise</td>
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<tr>
<td>EAC_ROW(_{ij})</td>
<td>=1 if exporting (importing) country is a member of EAC in DOTS database (UN Comtrade database), 0 otherwise</td>
<td>WTO and authors’ calculation</td>
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<tr>
<td>ROW_EAC(_{ij})</td>
<td>=1 if exporting (importing) country is a member of EAC in DOTS database (UN Comtrade database), 0 otherwise</td>
<td>WTO and authors’ calculation</td>
</tr>
<tr>
<td>CEMAC(_{ij})</td>
<td>=1 if both countries (i) and (j) are members of the Central African Economic and Monetary Community, 0 otherwise</td>
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<tr>
<td>CEMAC_ROW(_{ij})</td>
<td>=1 if exporting (importing) country is a member of CEMAC in DOTS database (UN Comtrade database), 0 otherwise</td>
<td>WTO and authors’ calculation</td>
</tr>
<tr>
<td>ROW_CEMAC(_{ij})</td>
<td>=1 if exporting (importing) country is a member of CEMAC in DOTS database (UN Comtrade database), 0 otherwise</td>
<td>WTO and authors’ calculation</td>
</tr>
<tr>
<td>WAEMU(_{ij})</td>
<td>=1 if exporting country is a member of the West African Economic and Monetary Union, 0 otherwise</td>
<td>WTO and authors’ calculation</td>
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<tr>
<td>WAEMU_ROW(_{ij})</td>
<td>=1 if exporting (importing) country is a member of WAEMU in DOTS database (UN Comtrade database), 0 otherwise</td>
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<tr>
<td>ROW_WAEMU(_{ij})</td>
<td>=1 if exporting (importing) country is a member of WAEMU in DOTS database (UN Comtrade database), 0 otherwise</td>
<td>WTO and authors’ calculation</td>
</tr>
<tr>
<td>EC(_{ij})</td>
<td>=1 if both countries (i) and (j) are members of the European Community, 0 otherwise</td>
<td>WTO and authors’ calculation</td>
</tr>
<tr>
<td>NAFTA(_{ij})</td>
<td>=1 if both countries (i) and (j) are members of the North American Free Trade Agreement, 0 otherwise</td>
<td>WTO and authors’ calculation</td>
</tr>
<tr>
<td>ANDEAN(_{ij})</td>
<td>=1 if both countries (i) and (j) are members of the Andean Community, 0 otherwise</td>
<td>WTO and authors’ calculation</td>
</tr>
<tr>
<td>MERCOSUR(_{ij})</td>
<td>=1 if both countries (i) and (j) are members of the Southern Common Market, 0 otherwise</td>
<td>WTO and authors’ calculation</td>
</tr>
<tr>
<td>AFTA(_{ij})</td>
<td>=1 if both countries (i) and (j) are members of the ASEAN Free Trade Area, 0 otherwise</td>
<td>WTO and authors’ calculation</td>
</tr>
</tbody>
</table>

Note: BLNS = Botswana, Lesotho, Namibia, and Swaziland. CEPII = Centre d’Etudes Prospectives et d’Informations Internationales; CPI = consumer price index; DOTS = IMF, Direction of Trade Statistics; IFS = IMF, International Financial Statistics; WDI = World Bank, World Development Indicators; WTO = World Trade Organization.

TABLE 2B.3

<table>
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<tr>
<th>Data for BLNS in the Direction of Trade Statistics Sample</th>
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<td><strong>Variable</strong></td>
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<td>Real exports</td>
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<td>Nominal exports</td>
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<td>U.S. CPI</td>
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### Table 2B.3 (Continued)

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<th>Variable</th>
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<th>Sources</th>
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<tbody>
<tr>
<td>Real GDP</td>
<td>Sum of GDP for BLNS</td>
<td>WDI and authors’ calculation</td>
</tr>
<tr>
<td>Population</td>
<td>Sum of population for BLNS</td>
<td>WDI and authors’ calculation</td>
</tr>
<tr>
<td>Volatility</td>
<td>Weighted average of standard deviation of the log change in the monthly bilateral nominal exchange rate (weights are population shares)</td>
<td>IFS and authors’ calculation</td>
</tr>
<tr>
<td>Distance</td>
<td>Weighted average of geodesic distance between largest cities (weights are population shares)</td>
<td>CEPII and authors’ calculation</td>
</tr>
<tr>
<td>Area</td>
<td>Sum of area in kilometers squared for BLNS</td>
<td>CEPII and authors’ calculation</td>
</tr>
<tr>
<td>Landlocked</td>
<td>=1</td>
<td>CEPII and authors’ calculation</td>
</tr>
<tr>
<td>Locked</td>
<td>=landlocked, + landlocked, i + landlocked, j</td>
<td>Authors’ calculation</td>
</tr>
<tr>
<td>Contiguous</td>
<td>=1 if the individual dummy is 1 for Botswana, Lesotho, Namibia, or Swaziland, 0 otherwise</td>
<td>CEPII and authors’ calculation</td>
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<td>Colony</td>
<td>=1 if the individual dummy is 1 for Botswana, Lesotho, Namibia, or Swaziland, 0 otherwise</td>
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<td>Common language</td>
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Note: BLNS = Botswana, Lesotho, Namibia, and Swaziland; CEPII = Centre d’Etudes Prospectives et d’Informations Internationales; CPI = consumer price index; DOTS = IMF, Direction of Trade Statistics; IFS = IMF, International Financial Statistics; WDI = World Bank, World Development Indicators; WTO = World Trade Organization.
Botswana, Lesotho, Namibia, and Swaziland (BLNS) receive significant government revenues in transfers from the Southern African Customs Union (SACU). As a percentage of GDP and total revenues, these transfers were very large and rising during 2007–09. In Lesotho and Swaziland, SACU transfers exceeded a third and a quarter of GDP, respectively, in 2008/09 (Figure 3.1).\(^1\) The magnitude of these transfers makes public finances in BLNS highly dependent on their evolution. The very high volatility of SACU transfers significantly complicates BLNS’s public financial management.\(^2\) In contrast, SACU transfers to South Africa (about 1 percent of GDP) are not nearly as important as they are for BLNS.

A major factor behind the volatility of SACU transfers is the composition of the union’s common revenue pool, which consists largely of revenue from customs duties and, to a lesser degree, excise taxes (Box 3.1). Volatile customs duties are the main revenue source for the common pool. It is well known that trade tends to move procyclically and to display wider swings than output, making the ratio of customs duties to total output highly variable.\(^3\) In fact, the recent global recession was characterized by the severity of the contraction in trade that accompanied it. In SACU’s case, revenue pool volatility is amplified further by the high proportion of customs duties accounted for by duties on imported motor vehicles, which tend to be even more procyclical than other imports.

SACU transfers also suffer from an additional, technical source of volatility, arising from the existence of what, for lack of a better term, will be called the “T + 2 adjustment mechanism.” Transfers from the SACU common revenue pool at year $T$ are made based on a forecast of revenue collections made at year $T – 1$.

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1. The fiscal year begins April 1.
2. For a comprehensive discussion of revenue sharing within SACU, see Mongardini and others (2011).
3. In addition, some volatility is attributable to changes in effective duty rates. For example, duties were waived on imports related to World Cup infrastructure investment, leading to a significant shortfall in SACU revenue.
If the transfer to a SACU member is larger (smaller) than it is entitled to receive by treaty in a given fiscal year (FY) $T$, the excess (shortfall) will be reversed two years later ($T + 2$) through an “adjustment” to the SACU transfer. In practice, this mechanism amplifies the variance of SACU transfers beyond the variance of the underlying common revenue over the medium term, even if it makes payments more predictable in the short term.

This chapter presents different options for reducing the volatility of SACU transfers from the common revenue pool. The motivation is to identify the significant benefits to mitigating and managing volatility at the origin. Ultimately, each country receiving distributions from SACU must be responsible for its own fiscal decisions, but reducing the volatility of payments at the origin would greatly facilitate fiscal management for each member country. Chapter 4 shows
how fiscal reforms in BLNS can reduce dependence on SACU transfers, including through an appropriate fiscal adjustment and the possible use of fiscal rules.

The section that follows discusses possible solutions for mitigating the impact of the “$T+2$ adjustment mechanism.” One of the technically easiest options is to extend the period for correcting over- and underpayments to the member states. A collective approach to managing SACU revenue volatility is explored in the third section. There is significant merit in decomposing the stream of revenue collections into structural and cyclical components and then distributing only the structural component of the common revenue pool each year. The fourth section looks briefly at some current ideas, including moving toward closer economic integration and using the destination principle for distributing SACU revenues. Closer economic integration would open new options for managing SACU-related revenues and fiscal policy more generally—for example, by making it possible to rely on less-volatile revenue sources, eliminating fiscal frontiers, and collectively managing the spending of (some of) the common revenues. This would be, in the best of scenarios, a long-term proposition. Supporters of the destination principle argue that the common revenue pool could be abolished, and customs revenues could be distributed to the countries of final use of the imported goods originating outside SACU. However, this option would lead to stricter fiscal frontiers, undermining intraregional trade and destabilizing member countries.
ADDRESSING VOLATILITY STEMMING FROM THE T + 2 ADJUSTMENT MECHANISM

When a BLNS country receives from SACU more (less) than it is entitled to receive in a given fiscal year, the excess (shortfall) is reversed two years later through a special adjustment. This practice increases the variance of SACU transfers. Possible options to eliminate or mitigate such excess volatility will be discussed.

In the words of the SACU Agreement itself (Annex 1, paragraph (g)):

Where revenue forecasts for year (t) are used to calculate the size of the customs component to be distributed over the course of year (t), adjustments will be made in years (t+1) and (t+2) to account for differences between the forecast and actual revenue collected.

Similar clauses apply to the excise and development components of SACU revenue as well. In practice, “differences between the forecast and actual revenue collected” cannot be corrected in year T + 1 because of lags in the availability of relevant information (the outcome of year T is known after year T + 1 has begun). Before T + 1 starts, a careful observer can form an idea of the approximate size of the adjustment that will be needed; but any legally valid correction has to wait for final information on T, that is, it cannot happen before T + 2.

To understand the effects of T + 2 adjustments, it is useful to consider payments over the period 2007/08 to 2010/11 (Table 3.1):

- In FY2009/10, the total distribution to BLNS was nearly 28 billion rand (R), which was the sum of R21.2 billion, corresponding to the expected BLNS shares in the FY2009/10 revenue pool (as forecast in December 2008), and an adjustment of R6.7 billion, corresponding to the amount needed to correct an underpayment dating back to FY2007/08, itself caused by a positive surprise to the revenue pool that year.

- In FY2010/11, the total distribution to BLNS declined by 46 percent to R15 billion, which was the sum of R19.5 billion, corresponding to the expected BLNS shares in the FY2010/11 revenue pool (as forecast in December 2009), and a negative adjustment of R4.5 billion, representing the amount needed to correct an overpayment that took place in FY2008/09.

<table>
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<td><strong>SACU Transfers to BLNS, 2007/08–2010/11</strong></td>
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<td>Forecast share</td>
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<td>Actual adjustment</td>
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<td>SACU payments</td>
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Sources: South Africa Budget Review (2011); and IMF staff estimates.

Note: BLNS = Botswana, Lesotho, Namibia, and Swaziland; SACU = the Southern African Customs Union.
The goal of the current SACU revenue-sharing formula was to provide certainty to BLNS about the payment for the upcoming fiscal year, but it amplified the revenue drop in FY2010/11. Serial correlation in revenues means that shocks in revenue data are normally followed by similar “aftershocks.” For example, lower-than-forecast revenue collections in FY2008/09 (negative shock) meant that lower revenue was forecast for 2010/11 (negative aftershock). However, because of the \( T + 2 \) adjustment mechanism, the negative shock was delayed and materialized at the same time as its own aftershock in FY2010/11. This coincidence in time of a shock and its own aftershock causes the variance of SACU transfers to rise above the original variance of the underlying revenues. The variance of SACU transfers under the \( T + 2 \) adjustment mechanism is estimated to be 38 percent higher than the variance of the actual revenues that BLNS are entitled to receive.\(^4\)

In theory, the \( T + 2 \) adjustment mechanism gives the BLNS countries time to prepare for the shock. In practice, some of the BLNS countries, particularly the smaller countries, have had difficulties managing the volatility of SACU payments. Their ability to manage budgets is made significantly more difficult by very large swings in revenue. Even if the government can see the swings coming, it may be difficult to resist pressures to increase permanent commitments on the upswing, and even harder to cut back spending when SACU revenue drops.

Different options, with their own specific advantages and disadvantages, are available for dealing with the excess volatility problem:

- **Let the forecast be final.** Any under- or overpayments arising from differences between expected and realized revenues would be deemed bygones. This option eliminates short-term uncertainty and overall volatility would be limited to the volatility of the revenue forecasts, which is lower than the volatility of revenues themselves. However, this option would create incentives for countries to manipulate the inputs that go into revenue forecasts, and thereby create an atmosphere in which even technically sound forecasts may be suspected of manipulation.

- **Pay as you collect.** A simple option that can be implemented without much complication. The obvious cost is the loss of certainty of the amount that will be received the upcoming year. Adopting this option would imply accepting short-term uncertainty for the sake of reducing overall variance over the medium term.

- **Spread adjustment over more years.** SACU members could modify the current system by requiring that adjustments for the under- or overpayments experienced in year \( T \) be spread over a number of years. The higher the number of annual installments, the lower is the variance in distributions that can be achieved. However, this option has an implicit cost.

\(^4\)The analysis of the volatility mechanisms is presented in Cuevas and others (forthcoming).
Unremunerated credit would be constantly, implicitly extended and extinguished. If the forecast undershoots the true revenue, the loan is from BLNS to South Africa; if the true revenue falls short of the forecast, South Africa lends to BLNS. In other words, an adjustment spread over many years also represents a commitment to “lend” or “borrow” the excesses and the shortfalls in receipts for many years, as opposed to the current adjustment, in which the implicit loan is paid back in two years. Therefore, a very long adjustment period may not be acceptable in practice—at least not without the introduction of proper terms for these implicit loans, such as explicit interest charges (which should be relatively easy to handle in practice).

MITIGATING SACU REVENUE POOL VOLATILITY: A COOPERATIVE APPROACH

The previous section dealt with the volatility-amplifying effects of a technical aspect of the revenue-sharing mechanism, but the more fundamental problem of dealing with the volatility of the revenue pool itself would remain. As noted earlier, significant benefits could accrue from managing the volatility of the revenue pool collectively rather than at the level of individual countries.

To deal with the pronounced procyclicality of the common revenue pool, SACU member countries could decide to distribute each year only the structural component of the common revenue pool. When revenues are above potential, the member countries would save the cyclical component of revenues in a stabilization fund. When revenues are below potential, the countries could cover cyclical shortfalls by making withdrawals from the stabilization fund. In practical terms, at year \( T - 1 \), the member countries would need to reach consensus on the size of the structural component of the revenue pool to be distributed the following year \( T \). This system would have no need for further adjustments in future years. The agreed-on distributions should also take into account the minimum level of assets in the stabilization fund needed for precautionary reasons; thus, during an initial accumulation phase distributions would need to be lower than the estimated structural component of revenue.

This approach raises two fundamental questions. First, what are the advantages of the collective approach over management of SACU revenue volatility at a country level? And second, what methodology should be used for estimating the structural component of the common revenue pool?

Pros and Cons of a Collective Approach

Key advantages of the collective approach include the following:

- Commitment to countercyclical fiscal policy would be more credible (although not necessarily guaranteed). This advantage would be particularly important for countries that need to further develop their fiscal institutions.
• Fiscal policy could be better coordinated, which could be beneficial, especially for the four SACU members belonging to the Common Monetary Area. 5

• Member countries, especially those needing to strengthen their institutions, would be less likely to find themselves in extreme situations in which they would need external financial support.

• A larger precautionary fund may earn a higher gross rate of return with lower management costs, benefiting all member countries. Also, pooling the cyclical component of common revenues would allow for joint use of scarce management skills and would avoid duplication of country-level management efforts.

The key disadvantages of the collective approach to managing volatility of SACU revenues include:

• a certain loss of sovereignty over the use of the cyclical component of the pool and

• difficulties in reaching consensus on the structural component of the pool and the optimal size of the precautionary deposit.

Whether the advantages of the collective approach to managing volatility outweigh the disadvantages is ultimately for policymakers to determine.

Simulation of the Structural Component

Numerous approaches can be used to estimate the structural component of the common revenue pool. One option, used in this chapter, is to determine the structural component of the pool using a Hodrick-Prescott filter in combination with an autoregressive moving average forecast based on the information available at the time of the forecast. 6

This approach is admittedly simplistic, but the volatility of SACU transfers would have been significantly lower if the countries had distributed the structural component of the SACU common revenue pool derived through the recursive Hodrick-Prescott filter (Figure 3.2). The standard deviation of the quarterly structural distribution to BLNS as a share of GDP would have been 25 percent of the standard deviation of the quarterly actual cash payments to BLNS during 2007–10. Other more sophisticated or elaborate modeling strategies could be adopted and the member countries could potentially invite independent experts to help them produce estimates of structural revenues. A more rigorous approach to modeling should improve on the performance of the type of rule discussed here.

But would the proposed scheme have been feasible? This depends on the starting balance of the stabilization fund. If the stabilization fund had started

5 Lesotho, Namibia, South Africa, and Swaziland.
6 Technical details of estimates of structural and cyclical components are provided in Cuevas and others (forthcoming).
operations in 2007/08 with a balance of R10 billion, and enjoyed a 6 percent nominal return on assets, the fund would not have run out of money during the period of the analysis, which includes the 2009 recession and ends in the third quarter of 2011. This hypothetical performance highlights the need for the members to consider an initial accumulation period during which they would receive less than the full structural component of the pool, to save and permit the stabilization fund to attain the size necessary to withstand large cyclical shocks. It also underscores the need for conservative management of the portfolio of assets in the stabilization fund to ensure value preservation.

**Figure 3.2** Simulations of SACU Revenue Payments, 2007–10 (Percentage of GDP)
Sources: National Treasury of South Africa; and IMF staff estimates.
Note: HP = Hodrick-Prescott; SACU = Southern African Customs Union.
and liquidity. A detailed discussion of the trade-offs that would be faced in setting up and growing the stabilization fund goes beyond the scope of this chapter.

Finally, in addition to the structural distribution rule, the member states could agree to review import shares every three to five years (rather than annually), which would also contribute to more stable revenue flows, in particular to the smaller member states.

OPTIONS BEYOND THE CURRENT REVENUE-SHARING FRAMEWORK

The discussion so far has centered on ways to reduce volatility within the current revenue-sharing framework. However, the framework is currently under review by the SACU member countries, and several concrete ideas for its modification have been floated. This section reviews two such ideas.

Toward an Economic Union

The collective approach to managing SACU revenue discussed in the previous section could be a stepping stone toward closer integration. In fact, the SACU member countries have proclaimed an ambitious long-term objective of moving toward an economic union (see SACU, 2010) whose institutions could further promote countercyclical policies and quicker convergence among member states. Closer integration could be achieved by exploring options for less volatile pooled revenue sources, eliminating tax-related border formalities (fiscal frontiers), and taking different approaches to spending the common revenue pool. The latter could include non-earmarked transfers to member states, earmarked grants similar to European Union (EU) structural funds (Box 3.2), or investment in regional infrastructure conveying collective benefits.

The various distributional aspects will need to be resolved by member states. Mechanisms that will ensure that transfers to member countries do not fluctuate significantly despite the inevitable volatility of the revenue pool would also be important. The union could, for example, seek to have a structurally balanced budget.

Allocation of Customs Revenues to Countries of Final Use of Imported Goods

Some observers and economists in the region have proposed moving to a destination principle in distributing customs revenues. They argue that the common revenue pool could potentially be abolished, and customs revenues could be distributed to the countries of final use of the imported goods originating outside SACU. Customs revenues could be collected in either of two possible ways. First, the country of first entry of the imported good collects revenues to be remitted to the country of final use after deduction of a collection fee. Or second, fiscal
frontiers are reinforced, and customs revenues are collected directly by the country of final use.

Adopting revenue-sharing based on the country of final use would be destabilizing for BLNS. First, BLNS would need to build the capacity to collect customs duties at their intra-union frontiers or at least a system of tracking goods in transit would need to be established. These changes would require sufficiently long transition arrangements. Second, assuming that institutional and transition challenges are addressed, revenue losses for BLNS would be large because import duties collected on extra-SACU imports based on the destination principle are likely to be significantly lower than the average level of distributions under the current system; further losses would follow from efforts to undertake massive fiscal adjustments and from stricter fiscal frontiers. Such an adjustment may

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7 Given existing shortcomings of trade statistics, in particular on re-exports, it is difficult to estimate potential direct revenue losses from a hypothetical move to the destination principle. Based on official statistics on trade with non-SACU countries and assuming an average tariff of about 20 percent, estimates of possible direct revenue losses for BLNS vary from about 6 percent of GDP to more than 20 percent of GDP, depending on the country.
destabilize poorer countries, creating significant humanitarian challenges for the region. Third, the erection of stricter fiscal frontiers between members would increase the cost of doing business and discourage intra-union trade, inflicting significant costs on private sector participants in both larger and smaller member countries. The empirical study presented in Chapter 2 finds that all SACU members have benefited from the trade creation induced by SACU; reform of the revenue-sharing formula should, therefore, support greater integration and avoid introducing new barriers to trade.

CONCLUSIONS

SACU members are rightly interested in finding ways to reduce the volatility of distributions under the union’s revenue-sharing arrangement. This chapter has explored various options:

- In the near term, a straightforward option would be to reduce the additional volatility by modifying the existing “T + 2 adjustment mechanism.” Under- and overpayments could be settled over a longer period than the current two years. This option would be easy to implement within existing administrative and analytical structures; in fact, it could be implemented immediately, if member countries so wished. An important feature of this option is that it would maintain certainty about the amount of the upcoming payments to BLNS and still reduce the volatility of payments over time. Alternatively, SACU members could revert to a pay-as-you-collect system (simple, but reintroduces short-term uncertainty) or use forecasts to determine final payments (difficult to implement because it would create incentives to manipulate the forecasts and thus undermine the credibility of any forecasts, however sound).

- Over the near to medium term, a more fundamental option would be to separate the structural and cyclical components of the SACU common revenue pool, and distribute only the structural component every year. To make this operational, it would be necessary to set up a stabilization fund, into which excess (positive) cyclical revenues would be deposited in good times and saved to cover future shortfalls created by low cyclical revenues in bad times. The challenges are not insurmountable, but implementation would require consensus building and preparatory work to design and establish the necessary institutions and mechanisms.

- Over the long term, a move toward deeper integration might open up new ways to manage both the volatility of SACU transfers and the use of these resources in a broader sense, reinforcing countercyclical principles of fiscal policy. However, the SACU member countries first need to consider and reach consensus on difficult political questions related to the ownership and distribution of union revenues and the sovereignty of member countries. In this context it is also important to note that trade liberalization is likely to erode revenue collections over the long term.
Therefore, SACU members would be wise to prepare themselves by reducing their reliance on SACU transfers and developing domestic sources of tax revenue.

- Moving to the destination principle in allocating customs duties, in particular if implemented quickly, would undermine intraregional trade, destabilize public finances of BLNS, and may increase the risk of major humanitarian problems in the region.
Following the onset of the global economic crisis in 2008, Southern African Customs Union (SACU) member countries experienced a significant growth slowdown and deterioration of their fiscal balances. This deterioration came from two sources. First was a considerable reduction in SACU transfers, which account for a large share of total revenue for Botswana, Lesotho, Namibia, and Swaziland (BLNS), owing, in part, to the global crisis, which reduced the SACU revenue pool, but also to the procyclicality of the revenue-sharing formula, which aggravated the decline (see Chapter 3). Second, there were increased expenditures prior to the crisis. The decline in fiscal balances underscored the need for fiscal consolidation and a new set of institutional reforms to encourage adherence to prudent fiscal policies and reduce the dependence on SACU transfers.

BLNS relied on temporarily high SACU transfers to finance high levels of recurrent expenditure, notably on the wage bill (Figure 4.1). Thus, lower SACU revenues translate into higher fiscal deficits, which are difficult to reduce rapidly given the recurrent nature of many expenditure items.

Aware of the risks, BLNS have already taken significant fiscal adjustment measures. Revenue collection has been improved with the introduction of the value added tax (Swaziland), increased tax rates and duties (Botswana and Swaziland), and continued improvements in revenue administration. In parallel, expenditures were restrained in many countries, with outright cuts in capital spending (Botswana), non-priority spending (Lesotho, Namibia, and Swaziland), wage freezes (Botswana and Swaziland), and further plans to reduce the wage bill (Lesotho and Swaziland). However, despite these measures, primary fiscal balances deteriorated for all countries (except Botswana) during the crisis (i.e. from 2008/09 to 2011/12), with a worsening of primary balances ranging from 5 percent to about 20 percent of GDP. Botswana experienced an improvement of about 6 percent of GDP over the same period, largely because of cuts in capital spending.

This chapter is partly based on Basdevant and others (2011).

Before the crisis, SACU transfers represented about 25–30 percent of GDP for Lesotho and Swaziland and about 10 percent for Botswana. The large swings in SACU transfers were in contrast to otherwise rather stable fiscal revenue.
Although SACU transfers to BLNS have increased significantly in the fiscal year that started on April 1, 2012 (FY2012/13), the risk of lower SACU revenue over the medium term remains high, partly reflecting a likely slowdown of the global economy and trade liberalization. Hence, further fiscal adjustment is needed to reduce the dependence on SACU transfers and restore fiscal buffers. The fiscal policy implications for South Africa differ from those for BLNS. South Africa has been primarily affected by a significant contraction in activity, resulting from lower global economic growth. The policy response was to provide fiscal stimulus to the extent that fiscal space was available. Given that customs and excise revenues are a small fraction of South Africa’s revenue collections, a reduction in SACU transfers would not have a very large impact on South African fiscal policy. As a result, the remainder of this chapter will focus exclusively on BLNS.

South African fiscal policy has strong spillover effects on BLNS through the sharing of receipts in the SACU pool. South Africa generates about 90 percent of the revenue of the SACU pool,2 and under the existing rule, SACU transfers to BLNS are heavily dependent on South Africa’s GDP and import projections. Thus, as described in Chapter 3, revenue received in a given year \( T \) are based on GDP and import projections for that year, and an adjustment is made in year \( T+2 \) to correct for discrepancies between the transfers received (based on projections) and the level corresponding to the actual collections (based on actual numbers). Empirically, this two-year lag has led to procyclical transfers because downward adjustments have usually occurred simultaneously with lower activity

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

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in the cycle. This procyclicality has proven to be damaging, especially in light of the global financial crisis, because the sharp contraction in SACU transfers created heightened risks of debt distress.

The crisis also revealed the importance of redefining fiscal coordination in SACU, in the context of the close economic and monetary integration among the members of the Common Monetary Area (CMA). Without greater coordination—as well as greater 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 with which BLNS can respond to the decline in 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 and maintaining positive growth prospects.³ In contrast, South Africa would also need to factor in the potential impact of its policies on BLNS because these policies could create spillover effects for BLNS, the magnitude of which could complicate implementation of sound fiscal policies in BLNS.

This chapter explores these two issues—adjusting to potentially lower SACU transfers and increasing fiscal coordination in the region—by addressing the following questions:

- How could BLNS adjust their fiscal stance given the risk of a large permanent decline in SACU transfers foreseen for the medium term?
- Could the SACU members (excluding Botswana) strengthen their regional fiscal institutions, to support their exchange rate pegs in the context of the CMA and address the challenges raised by the spillover effects of the South African economy on BLNS?

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

In addition to defining common rules within SACU, BLNS countries may face the additional challenge of implementing a significant fiscal adjustment, which is discussed in this section.

Risk of a Decline in SACU Revenue Calls for Continued Fiscal Adjustment

BLNS face the risk of another economic decline over the medium term related to at least three factors: (1) a further slowdown in global economic activity, which

³The issue of external imbalances is discussed further in Basdevant and others (2011). Given the unprecedented contraction of SACU transfers and competitiveness issues in BLNS, the question of restoring external balances is essential in designing the fiscal adjustment. It reinforces the recommendation for a fiscal adjustment that would restore competitiveness by reducing the public sector wage bill.
would affect the SACU revenue pool; (2) a reduction in the common external tariff rates as a result of trade liberalization; and (3) the creation of the Southern African Development Community (SADC) customs union. Quantifying these risks is beyond the scope of this chapter. However, a worst-case scenario based on a significant decline in global economic activity and steady progress in trade liberalization suggests that SACU transfers to BLNS could decline in the range of 5–15 percent of GDP over the medium term compared with the 2012/13 levels (Table 4.1). These estimated declines are used to derive the adjustment strategy discussed in this section. Although the specific magnitude of each country loss could be relatively lower, the results are nevertheless qualitatively robust. Thus, the policy recommendations would remain broadly the same, even if the size of the needed fiscal adjustment were to be smaller.4

Similarly, lower SACU transfers worsen the external positions of BLNS.5 BLNS currencies are pegged to the rand (a crawling peg for Botswana and parity for the others).6 Accordingly, the ability to use monetary policy actively is limited by the need to defend the pegs.

Analyzing Design Options for the Fiscal Adjustment in BLNS

A dynamic stochastic general equilibrium model is used to analyze options for BLNS fiscal adjustment (see Basdevant and others, 2011). The general equilibrium structure provides a coherent framework for tracing the macroeconomic effects of fiscal consolidation from the original steady state (the state before a permanent SACU transfer reduction) to a new steady state (the state reached years after such a reduction). Policy choices are predicated on the assumption that the government does not engage in additional borrowing to make up the financing gap. Thus, the only option is to adjust the fiscal stance, either by increasing non-SACU revenue, decreasing spending, or both. The debt pattern is assumed to remain fixed in the model.

4 The policy response was also analyzed in Mongardini and others (2011).
5 Although lower SACU transfers are partly compensated for 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.
6 See Wang and others (2007), which discusses the CMA under which Namibia, Lesotho, and Swaziland peg their currency to the rand.

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Sources: Country authorities; and IMF staff simulations.
Note: SACU = Southern African Customs Union.
Optimal fiscal adjustment strategies are based on multiple instruments because the composition of the adjustment is relevant to minimize the impact on growth.\(^7\) Five strategies were modeled: (1) increasing the consumption tax rate and cutting government consumption, (2) increasing the labor tax rate and cutting government consumption, (3) increasing both the labor and consumption tax rates, (4) drawing on the sovereign wealth fund for Botswana and increasing the consumption tax rate, and (5) cutting government consumption and investment. Multiple-instrument strategies are critical to securing broad political consensus on the reform, especially if otherwise only a specific segment 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 potential decline in transfers, a fiscal consolidation strategy that involves only one fiscal instrument, such as only increasing the consumption tax rate or only 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; the labor tax would have to be raised in Namibia by more than 10 percentage points (see Basdevant and others, 2011).

A combination of government consumption cuts and consumption tax increases\(^8\) appears to have the greatest impact on growth for all BLNS except Lesotho (Figure 4.2). Lesotho’s best option appears to be consumption and labor taxes.\(^9\) Cutting consumption (by lowering demand) puts downward pressure on wages, thus improving price competitiveness and growth prospects for the traded-goods sector. Lesotho is a different case, for which the best strategy would at first appear to combine a labor tax increase with a consumption tax increase. This result comes from the large absorption of nontraded sector output by the public sector, in combination with the relatively smaller size of the country’s traded-goods sector. However, this policy would have to be implemented through improvements in revenue collection and reductions of tax exemptions, instead of increasing tax rates (the value added tax rate is about 15 percent for goods and services, which is relatively high compared with the SACU region). Lesotho’s unique situation also is a result of the very large size of the government in the economy (government spending represented about two-thirds of GDP in 2009/10). From this perspective, although simulations of government spending cuts highlight how such cuts could lead to a significant contraction of the nontraded sector, the large size of the government would still underscore the need to implement spending cuts. These cuts could also help further strengthen a relatively weak external position.

In contrast, the negative impact on productivity of lower public investment makes policies based on this instrument clearly second best. Figure 4.2 shows that the GDP responses to public investment cuts range from 2 percentage points

\(^7\) See Basdevant and others (2011) for a more detailed analysis, especially on the underlying assumptions of the model and simulations.

\(^8\) The effective tax rate would increase by about 3–4 percentage points across countries, to a maximum of 7 percentage points (Swaziland).

\(^9\) Tax adjustments may need to be coordinated within SACU.
below the steady state (Lesotho, Namibia) to 4–5 percentage points below (Botswana, Swaziland). Lower public investment propagates through the rest of the economy by lowering the productivity of private investment. Even with a companion instrument, the strong negative impact of cuts to investment remains dominant. The simulation, therefore, has strong policy implications: to alter the

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10 This result is robust to alternative simulations involving public investment cuts (see Basdevant and others, 2011, for details).
negative impact of fiscal consolidation on growth, investment spending must be protected. However, the recommendation would only apply to investment spending that effectively contributes to enhancing the productivity of the whole economy. Ranking investment projects by both their costs and their benefits is essential. Cutting *prestige* investment spending would, in reality, be more like cutting government consumption rather than truly cutting investment. In addition, even potentially useful investment could become ineffective by, for example, overpricing by suppliers, execution delays, or lack of complementary investments.

**Figure 4.3** Current Account Balance Response to Different Policy Instruments (Deviation from steady state, in percentage points of GDP)

Source: IMF staff estimates and projections.

Note: The current account balance is proxied by the sum of the trade balance and transfers from the Southern African Customs Union (SACU), the other items of the balance of payment, with the exception of the reserves at the central bank, being held constant vis-à-vis the steady state. Also, x-axes show the number of years after the initial loss of SACU revenue.
Botswana’s sovereign wealth fund (SWF; the Pula Fund) could also be used to ease the adjustment, but it has to be combined with other instruments. The effects of this dual instrument mainly come from the accompanying instrument (in this case, a consumption tax), which adjusts to make up for the SACU transfer reduction. Despite this caveat, the use of an SWF can indeed provide some relief in the adjustment effort. However, two hurdles must be overcome: (1) the drawdown of the SWF raises net government debt, potentially creating debt vulnerability even with no change in gross debt, and (2) use of the resources of an SWF is better suited to a temporary shock—use of the SWF cannot be sustained to respond to a permanent shock. Overall, the use of an SWF would not have a significantly different impact on growth than using the consumption tax alone—even for Botswana, whose SWF is large.

External imbalances are effectively reduced by the fiscal consolidation, mirroring the contraction of domestic absorption (Figure 4.3). 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 4.3) is fairly limited. This result reflects the strong fiscal response, the contraction in domestic demand, and improvements in competitiveness. For most countries, with the notable exception of Lesotho, all fiscal consolidation strategies perform equally well over the medium term. After a short-lived deterioration in the current account balance, it takes about one to two years, on average, to reach a level similar to that in effect before the drop in SACU transfers. It comes as no surprise that the adjustment is much slower when the SWF is used in Botswana, because the demand adjustment takes place more gradually.

Lesotho brings a different perspective to the fiscal consolidation. The best strategy for minimizing the growth impact, namely, taxing consumption and labor income, is actually less efficient in improving Lesotho’s current account balance (by about ¼ percent of GDP). Again, this anomaly occurs because of the relatively lower weight of the external sector in Lesotho and the relatively higher weight of the government sector.

FISCAL COORDINATION WITHIN SACU: COULD FISCAL RULES BE APPROPRIATE?

Devising a regional approach to fiscal prudence is appropriate for SACU, particularly in light of expected greater economic integration. As shown in this section, both SACU-level and national-level fiscal rules (Box 4.1) would assist in tackling the heavy dependence on SACU transfers and deficit biases in BLNS. Fiscal rules would also help to anchor the strong fiscal adjustment already undertaken by BLNS to preserve fiscal sustainability.

It is in South Africa’s interests to take into account its spillover effects on BLNS because fiscal imbalances in BLNS are, in the end, contingent liabilities for South Africa. Because of the CMA and the prospects of further regional financial
BOX 4.1

**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 or procedures for budget elaboration and implementation (Kopits and Symansky, 1998; IMF, 2005, 2009). The rule is permanent because it responds to a risk of deficit bias, that is, the implementation of policies that are either suboptimal (a deficit higher than its optimal level) or a threat to fiscal sustainability. Credible rules can lead to higher welfare than can discretionary policies (Barro and Gordon, 1983; Drazen, 2000), as well as to lower risk premiums (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, “creative” accounting rules could be used to hide a missed deficit target. Improvements in procedural rules would typically cover (1) strengthening the position of the Minister of Finance, (2) limiting the scope of amendments to the budget during discussions in parliament, and (3) enforcing hard budget constraints during the implementation phase. Fiscal transparency would also be essential to ensuring strong political and social support for the rules.

To avoid being too rigid, numerical rules need to leave space for flexibility. Similar to rules for monetary policy, fiscal rules could provide a tolerance band for countercyclical policies and escape clauses, so as to temporarily suspend the application of the rules during exceptional circumstances. Rules can also create incentives for nontransparent behaviors, leading to superficial compliance. In addition, the authorities may use legislative changes to alter rules to ensure formal compliance. These potential hurdles underline the need for institution building, when necessary, and development of a strong consensus on the rules.

As discussed in IMF (2009) and Debrun and Kumar (2007), successful implementation of fiscal rules is generally preceded by a period of fiscal consolidation. Although the introduction of fiscal rules is usually concurrent with improved fiscal performance, the causality is not clearly established (IMF, 2005; Guichard and others, 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 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.

Broad support and a legal foundation (not just political commitment) facilitate the implementation of fiscal rules. Policymakers will suffer the costs of non-enforcement of fiscal rules, either by loss of reputation for ruling parties or through legal sanctions that require specific actions. Law-based rules typically carry penalties for noncompliance. Commitments made to the public coupled with external monitoring raise general public awareness of deviations from the rule, creating reputational risks for the government.

integration, South Africa is de facto the lender of last resort for BLNS. Greater financial integration of the SACU region could facilitate access to financing by BLNS through South Africa’s bond markets. Government securities denominated in rand would offer lower premiums because the currency risk for investors would
disappear, although the sovereign risk would remain. A perception of sustainability,\textsuperscript{11} whether deserved or not, might also be created for the smaller SACU countries, which could translate into continued access to finance even under unsustainable policies. This type of risk occurred in recent years in the euro area, which led to debt accumulation beyond a sustainable level in some countries.

**Regional Integration Challenges Suggest Redefining the Revenue-Sharing Formula**

Although South Africa’s fiscal policies are sound, they do not account for potential spillover effects on BLNS. South Africa enjoys a significant degree of economic stability, and does not face specific vulnerabilities to either its public or external debt (IMF, 2011a).\textsuperscript{12} In particular, under the current revenue-sharing formula, SACU transfers are heavily dependent on South Africa’s projected GDP and imports. Forecasting errors have a limited impact on South Africa, but they induce large swings of revenue for BLNS, which are further aggravated by the procyclicality of the formula.

**SACU Numerical Rule**

A new revenue-sharing formula for the SACU pool could be adopted, with the objective of making the transfers more stable and predictable. Chapter 3 of this volume offers a wide range of options. Two characteristics would be essential for that rule to be sustainable and accepted: simplicity and transparency. Simplicity would suggest that redistribution should occur using an easily understood concept, for example, “pay-as-you-go,” in which revenue collected is redistributed at the time it is received.

**SACU Procedural Rule**

A buffer, such as a stabilization fund, could be established for the SACU region as a whole (see Chapter 3). For example, transferring only the structural component of the SACU revenue pool would ensure lower volatility while enforcing countercyclical fiscal policies on all SACU countries, including South Africa. This could also apply to the developmental component of the current SACU revenue-sharing formula.

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

**Defining Procedural Rules to Prevent the Recurrence of Sustainability Concerns in BLNS**

The global financial crisis showed that spending bias can build up rapidly (Table 4.2), which, combined with the decline in SACU transfers, has led to a significant increase

\textsuperscript{11} Or a perceived assurance of bail out from South Africa.

\textsuperscript{12} Its sound fiscal management has also been helped by the adoption of a medium-term budget strategy, which anchors each annual budget into a medium-term perspective.
in the risk of debt distress in BLNS, even though debt ratios were fairly low before the 2008 crisis (Figure 4.4). Although Botswana and Namibia are more resilient in the face of this shock than are Lesotho and Swaziland, all indicate a rapidly growing debt burden.

To complement the fiscal adjustment in BLNS, discussed above, one of the first actions must be to secure broad political and social support for correcting the spending bias to reduce the odds of a recurrence. The crux of the issue is fiscal transparency to build political support for the adjustment process.

**National Procedural Rule 1**

International best practices for fiscal transparency and for communicating to the public the need for an adjustment could be applied. Among other actions, financial accounts and budget execution reports would be published, and an external assessment would be performed (overseen by parliament, and including external audits of public accounts) and publicized. By disclosing budget documents, budget execution, and fiscal risks, governments would then have the tools to convince the public of the implications of the adjustment and could inform the public of their efforts to protect the most vulnerable. Communication campaigns could be organized to inform the public about the scale of the fiscal challenge and explain what can be reasonably achieved through reforms without overburdening taxpayers or unduly curtailing necessary public services. Similarly, communication of the adverse consequences of not making the adjustment would also be essential, particularly if the necessary fiscal adjustments were large. These transparency

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13 Using the IMF templates for debt-sustainability analysis, a simulation exercise was done for each BLNS country. The analysis assumed that expenditure levels, measured as a percentage of GDP, would remain during the medium term similar to the levels of the past few years.

14 Large fiscal adjustments would typically require strong support from all stakeholders (Mauro, 2011).
Designing Fiscal Policies within the Southern African Customs Union

efforts would need to be complemented by improvements in the quality of public spending, for example, by subjecting investment projects to cost-benefit analyses and publishing both the analyses and project rankings.

To deal with a large fiscal adjustment, and subsequently with the enforcement of a sound fiscal policy, BLNS would need to cast their policies within medium-term frameworks. The objective would be to anchor budgets to medium-term fiscal objectives, such as a debt or deficit target. Such steps would complement existing efforts made to strengthen expenditure controls, like those undertaken by BLNS, as well as tax administration.

National Procedural Rule 2

Medium-term expenditure frameworks (MTEFs) need to be adopted—or improved—to anchor the budgeting process to medium-term objectives. First, the
authorities could, within MTEFs, define the pace of the adjustment. Two elements strongly favor a front-loaded adjustment: (1) a front-loaded adjustment will reassure markets and international partners, especially when fiscal sustainability is at risk; and (2) longer fiscal consolidations can increase the probability of halting the adjustment before its completion (von Hagen, Hallett, and Strauch, 2001; and Tsibouris and others, 2006). \(^{15}\) Second, to be credible, MTEFs would need to leave room for contingency planning. Such space would be particularly relevant in the implementation of the fiscal adjustment plans. For 66 plans reviewed by Mauro (2011), the average discrepancy between the planned and actual improvement in the fiscal balance was about ½ percent of GDP. \(^{16}\) Finally, MTEFs would eventually become a tool for making national numerical rules operational. They would not only help bring 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.

**Defining National Numerical Rules**

Once procedures and institutional reforms are in place, a set of numerical rules could be adopted (Box 4.2). Instead of having just one numerical rule (say, on the primary deficit), BLNS would benefit from a regional approach to setting rules for fiscal policy. Two national-level numerical rules applied equally to all SACU countries could be considered.

**National Numerical Rule 1**

A common numerical rule on the debt-to-GDP ratio could be adopted. Although SACU members face very different challenges, for an economic union to be viable, member countries need to be treated equally. Thus, a long-term objective of keeping debt ratios below the same threshold for all countries would achieve the objective of an equal treatment. For example, a threshold for debt to GDP of about 40 to 50 percent would be relevant given that emerging market economies have shown vulnerabilities at debt levels higher than this threshold. It should be noted that Botswana has already adopted a debt ceiling of 40 percent of GDP, which is adequate for an emerging market economy. Namibia also has a debt ceiling of 35 percent in its fiscal policy framework, but this is not subject to legislation.

**National Numerical Rule 2**

Each member country could adopt a country-specific rule for its deficit to (1) comply with the common debt ceiling for all SACU countries over the medium term, and (2) respond to specific vulnerabilities. For example, South Africa could adopt a

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\(^{15}\) 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; and Kumar, Leigh, and Plekhanov, 2007).

\(^{16}\) 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.
Designing Fiscal Policies within the Southern African Customs Union

BOX 4.2

General Options for the Design of a Fiscal Rule

Three general types of numerical rules could be considered: debt rules, deficit rules, and 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 keeping debt sustainable (Table 4.2.1).

### TABLE 4.2.1

<table>
<thead>
<tr>
<th>Performances of Simple Numerical Rules against Key Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Debt ratio ceiling</strong></td>
</tr>
<tr>
<td>------------------------</td>
</tr>
<tr>
<td>Preserve a sustainable debt ratio</td>
</tr>
<tr>
<td>Sound deficit level</td>
</tr>
<tr>
<td>Avoids large adjustments in a single year</td>
</tr>
<tr>
<td>Limit procyclicality</td>
</tr>
<tr>
<td>Target relatively controllable</td>
</tr>
<tr>
<td>Comprehensive coverage</td>
</tr>
</tbody>
</table>

Source: IMF staff.

Note: +++ = 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 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 quality is poor 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 would give more flexibility, but at the cost of more complex enforcement.

fiscal deficit rule to allow for countercyclical intervention, and the more vulnerable countries of the region (Lesotho, Swaziland) could first consider a deficit rule aimed at preserving debt sustainability. Although the medium-term objective of a common debt ceiling would be desirable, Lesotho and Swaziland would probably need to constrain their deficits—and therefore their debt levels—much more strictly until they address the source of their vulnerabilities. Specifically, their targeted deficit levels could be directly derived from the debt-sustainability analysis.

Additionally, the SACU countries face different levels of access to financing. Although the most advanced (Botswana, Namibia, South Africa) can raise funds...
fairly easily, the poorest members (Lesotho, Swaziland) cannot. This rule could be implemented with some flexibility by adopting a ceiling for the primary balance for a certain period, say, three years, and revisiting the value every three years, based on the MTEF and financing conditions. For resource-rich countries the problem can be different. Botswana already has two numerical rules, one capping government expenditure at 40 percent of GDP, the other a “golden rule” in which the ratio of non-investment recurrent expenditure to nonmineral revenue stays below 1, so that mineral revenue is primarily directed toward investment projects. Another option would be to adopt a ceiling on expenditures that would be consistent with the primary balance objective. This option would also help Botswana in the implementation of its fiscal rule, because the cap on expenditure can lead to procyclicality when diamond prices increase (because it induces a higher GDP, thus increasing the maximum level of expenditure). Similarly, a target for non-mineral primary expenditure could also be adopted, or an expenditure rule could be based on real expenditure growth. Adopting an expenditure rule would present significant advantages because it would specifically target the source of the fiscal imbalances, but also, if implemented successfully, it would facilitate countercyclical intervention because automatic stabilizers would come into play on the revenue side (Table 4.3).

Some flexibility could be preserved by allowing the government to react to exceptional events by temporarily suspending fiscal rules. However, this would require two main elements: First, parliament would have to approve the government plan for the temporary suspension—ideally by a supermajority to ensure that the political consensus is solid. Second, the government would have to have a strategy for reinstating these rules, for example, no later than two years after suspension.

**Enforcing Numerical Rules: Lessons from the Euro Area**

Notwithstanding the specific design of numerical rules, the euro area experience suggests that without an 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 implementation of the rules, and legal requirements to comply with the rules.

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**TABLE 4.3**

<table>
<thead>
<tr>
<th></th>
<th>Fiscal balance rule</th>
<th>Expenditure rule</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Strengths</strong></td>
<td>Simple and transparent</td>
<td>Allows for (some) countercyclicality</td>
</tr>
<tr>
<td>Consistent with DSA</td>
<td></td>
<td>Can be consistent with the DSA</td>
</tr>
<tr>
<td><strong>Weaknesses</strong></td>
<td>Procyclical</td>
<td>Sensitive to assumptions (e.g., revenue growth)</td>
</tr>
</tbody>
</table>

Source: IMF staff.
Note: DSA = Debt sustainability analysis.
Constitutional amendments could be adopted by each country to define the general principle of the rules. These amendments could later be complemented by fiscal responsibility laws defining the specific features of the rule, including the quantitative ceilings and penalties for noncompliance. The main advantage of such legal changes is that they would create strong incentives for governments to comply ex ante with the fiscal rule through the legal requirements and prevent backtracking ex post through penalties. In addition, legal constraints could be put on the budget deficit approved by parliament, requiring that the deficit not exceed the boundaries of the rules.

A regional fiscal council at the level of the SACU Secretariat could also allow independent and cross-country scrutiny of the countries’ fiscal policies. The fiscal council would need to be independent of the political sphere. The council could report to the public regularly, perhaps quarterly, on the state of public finances in each SACU member country, based on budget execution reports provided by the SACU ministries of finance. The council would make public any deviation from the rule during the year. A government would then be required to explain to its parliament and other SACU members the reasons for the deviations and to present a plan to correct for them before the end of the fiscal year.

CONCLUSION

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

Fiscal adjustments also need to be embedded within a regional and medium-term framework of fiscal rules. These fiscal rules could effectively ensure that the hard-won fiscal adjustment underway in SACU countries is not reversed. Both strong political ownership and strong enforcement mechanisms would be required. Therefore, rules should be enshrined in law, preferably constitutional amendments, rather than simple political commitments. Adhering to best practices for fiscal transparency would be essential to building consensus on the rules. Finally, the creation of a SACU fiscal council would help to ensure that country and regional surveillance are effective.
The formation of currency unions has always been accompanied by intense debates on their costs and benefits for potential members. Even if monetary integration has an important political dimension, it rarely transcends national interest. “No nation has friends, only interests,” Charles de Gaulle, the late president of France, once observed. And in fact, as soon as serious tensions emerge within existing monetary unions, such as the euro area, existential questions about the potential merits of monetary sovereignty resurface. This chapter proposes a model-based assessment of this particular question in the context of the existing Southern African Common Monetary Area (CMA) and hypothetical expansions of it.

By nature, the simulation exercises developed in this chapter can only be partial and of a positive nature. Thus, they do not constitute (and cannot be interpreted as) normative assessments underpinning specific policy advice. In particular, there is no pretense that the model-based estimation of “optimal” macroeconomic policies precisely describes what governments and central banks should do (or what they would do under counterfactual benchmarks). Also, a model cannot provide a complete picture of the costs and benefits of monetary integration because, to remain tractable, it must ignore critical dimensions, including the combination of political interests and the varying levels of institutional preparedness across potential members.

Pioneered by Mundell (1961), a vast literature on the costs and benefits of monetary unions mushroomed in the wake of the creation of the euro in 1999. Early studies on optimum currency areas (OCA) emphasized the costs for structurally different countries affected by different shocks of opting for a common monetary policy. Hence, absent fluid labor and capital flows across countries or a fiscal union offering some risk sharing through intraregional transfers, it was generally thought that prospective members of a currency union should first reach a reasonable degree of economic convergence.

The debate on the euro in the 1990s remained dominated by these first-generation OCA arguments, in which the benefits are largely assumed and the

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1The CMA comprises Lesotho, South Africa, and Swaziland.
costs are directly proportional to the magnitude of cross-country divergences along selected dimensions. This line of thinking provided the theoretical underpinning for convergence criteria with which prospective union members should comply. Yet intense controversy developed around the need to have convergence criteria on public debts and deficits and to turn these criteria into permanent constraints once in the euro area. This heavily polarized issue created demand for formal economic models to investigate the implications of monetary unification for the coordination of the monetary-fiscal policy mix. Unlike OCA-based studies, models by Beetsma and Bovenberg (1998, 1999), among others, revealed explicit benefits of monetary unification with regard to credible monetary policy coordination and better insulation of the common central bank (CCB) from inflationary pressures motivated by public finances considerations.

Debrun, Masson, and Pattillo (2005) developed a model—hereafter DMP—along those lines and calibrated it to assess the net gains from monetary unification in various regions of Africa (see Masson and Pattillo, 2005; and Debrun, Masson, and Pattillo, 2008, 2011). The model allows for a simple and intuitive assessment of the costs and benefits of a given currency union. DMP simulations—which essentially compare the costs of losing monetary sovereignty to the gains associated with greater policy credibility—generally suggest that existing monetary unions in Africa are welfare-enhancing for all or most of their members when compared with the hypothetical counterfactual of a fully flexible exchange rate. The main driver of these credibility gains is that the power of individual governments to extract a higher inflation tax from the regional central bank is diluted proportionally to those governments’ influence on the conduct of the regional monetary policy. As a result, larger currency unions are more likely to be beneficial for all members unless newcomers are relatively large, fiscally undisciplined, and without meaningful trade linkages with the rest of the union. In relative terms, the costs attributable to asymmetric shocks emphasized by the traditional OCA literature—which argues for smaller currency unions composed of countries facing similar terms-of-trade shocks—are small.

In this chapter, a fully updated calibration of DMP is used to assess the net gains arising from the CMA and a number of hypothetical variants selected for their value in illustrating the model’s properties rather than their actual plausibility. Specifically, the analysis looks at the welfare impact of (1) being a member of the CMA, (2) expanding the CMA, (3) establishing a regional central bank to conduct monetary policy on the basis of union-wide conditions, and (4) combinations of (2) and (3). For (1), the model suggests that there are significant benefits of being a member of the CMA, particularly for Lesotho and Swaziland. For (2), a larger CMA that includes all current members of the Southern African Development Community (SADC) is desirable for all except the fiscally conservative.

These estimates are not meant to make precise comparisons among the countries but are intended to provide broad estimates of welfare gains and losses from CMA participation. More precise estimation for each country would require capturing more country-specific factors (policymakers’ preferences and institutional quality) and detailed measures of financial needs based on recent data.
Mauritius and Tanzania, and possibly Angola, whose terms of trade are very volatile and uncorrelated with its neighbors. For (3), the creation of a genuine CMA-wide monetary union with a regional central bank carries some costs in forgone anti-inflationary credibility because fiscally profligate countries could, despite their small size, extract a higher inflation tax. All members would be better off maintaining the current asymmetric CMA regime in which South Africa sets monetary policy. Finally, creating an SADC-wide currency union under the helm of a regional central bank continues to be beneficial for all except Mauritius, but the gains for existing CMA members—compared with the existing arrangement—are likely to be limited and fall well within plausible margins of error.

By design, the model leaves out a number of relevant issues. These include the political factors that may be essential for making currency unions work, the intrinsic benefits from exchange rate stability—less uncertainty promoting investment and intraregional trade—and the creation of a common money market. In addition, the smooth operation of a common currency area also hinges on building institutions (a central bank, a regional financial supervisor, common accounting standards) and on broader coordination of fiscal, structural, and regulatory policies. The scope of the model thus needs to be kept in mind when interpreting the results. Even though the gains are expressed in “welfare” terms, the analysis cannot validate normative statements on its sole merits. For instance, the recent euro area crisis has demonstrated the importance of solidarity and risk sharing among member countries, bringing to the fore fundamental questions about the extent of the loss of sovereignty—and the associated political costs—required for the sustainability of regional monetary unions. The simulations in this chapter could not possibly inform that essential debate. Instead, the model provides one useful benchmark that can be used for further evaluation of monetary union proposals along with more traditional OCA-based assessments and microeconomic analyses of a single currency.

The rest of this chapter is structured as follows. The second section reviews the OCA literature and previous analyses of the CMA experience. The chapter turns to the history and institutional arrangement of the CMA and looks at the state of economic convergence in the third section. The fourth section quantifies the welfare benefits of the CMA and hypothetical enlargements, and is followed by a section that deals with possible challenges of a common monetary union for the CMA member countries.

LITERATURE REVIEW

The traditional optimum currency area (OCA) literature discusses the costs of forfeiting monetary policy autonomy and the corresponding importance of alternative adjustment mechanisms to external imbalances. In his pioneering study, Mundell (1961) emphasized labor mobility as a crucial adjustment mechanism to

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1 Some broader considerations are surveyed in Hawkins and Masson (2003).
idiosyncratic shocks and, therefore, a key precondition for forming an OCA. Price and wage flexibility were also seen as important for coping with idiosyncratic demand shocks. Because shocks were more likely to be similar among highly integrated economies, McKinnon (1963) suggested the degree of openness—defined as the ratio of tradable to nontradable goods—as a key indicator in forming an OCA. Completing the trilogy of classic OCA studies, Kenen (1969) introduced product diversification as an element of an OCA, stressing that a region with a highly diversified production base should be better equipped to maintain a currency union than regions with low diversification because the latter were more vulnerable to asymmetric disturbances. In addition, Kenen highlighted fiscal integration among countries as a mitigating factor because of the implied risk sharing.

More recently, the literature extended the basic economic insights from the classical OCA approach to incorporate new dimensions, including the effectiveness and credibility of monetary policy (Beetsma and Bovenberg, 1999), the centrality of shock correlations (Alesina, Barro, and Tenreyro, 2002), and the endogeneity of OCA adequacy. Although it is generally understood that a higher correlation of shocks between countries makes monetary union more beneficial, Mélitz (1991) shows that even if countries face identical shocks, they might still need different policy responses given different initial economic positions and country-specific transmission mechanisms.

A number of studies suggest that monetary integration may be self-validating because OCA criteria are endogenous to the creation of a monetary union. Frankel and Rose (1997) argue that openness (degree of integration) and income correlation are linked because the correlation of business cycles across countries depends on trade integration. Mongelli (2002) qualifies that claim, showing that the endogeneity of OCA criteria depends on the preexisting degree of convergence. In the same vein, De Grauwe and Mongelli (2005) focus on the endogeneity of economic integration, financial integration, symmetry of shocks, and labor market flexibility.

Debrun, Masson, and Pattillo (2005) integrate traditional arguments against monetary union—the costs of a one-size-fits-all monetary policy in a heterogeneous region deprived of fiscal federalism—with the potential benefits of enhanced policy credibility, by explicitly modeling the substitutability between monetary integration and domestic institutional reforms (see Box 5.1). They establish the relevance of asymmetries in institutional quality and in the credibility of monetary commitments to macroeconomic stability. In contrast to the OCA literature, they emphasize positive “monetary externalities” associated with larger monetary unions attributable to the greater gains from monetary coordination and from a more effective separation of monetary and fiscal powers.

1Beetsma and Giuliodori (2010) provide a detailed survey on OCA theory and the Economic and Monetary Union in Europe.
2Frankel (1999) notes that the endogeneity of OCA criteria means that some parameters, such as openness and income correlation, are not irrevocably fixed, but instead can change over time in response to the countries’ fundamental policies and to exogenous factors.
3Blanchard and Wölfers (2000) point out the endogeneity of labor market institutions, and Issing (2001) stresses the endogeneity of political integration.
The model used in this chapter is a variant of Debrun, Masson, and Pattillo (2005). In line with the vast literature on the European Economic and Monetary Union, the model focuses on the impact of institutional changes on the credibility of a commitment to low inflation (see Beetsma and Bovenberg, 1998, 1999; and Martin, 1995). That approach has considerable appeal in countries and groups of countries in which the risks to macroeconomic stability and the need for further credibility-enhancing institutional reforms are deemed to be high.

To explicitly model credibility problems and institutional solutions, the basic architecture of DMP relies on the positive theory of monetary policy proposed by Barro and Gordon (1983) and extended to fiscal policy issues by Alesina and Tabellini (1987). DMP assumes an $n$-good, $n$-country economic area that is small compared with the rest of the world. Countries differ along various dimensions: size, economic governance (propensity to wasteful public spending), budget flows, and Phillips-curve shocks, which are interpreted as terms-of-trade disturbances. Because the welfare analysis rests on an explicit characterization of strategic interactions between monetary and fiscal policymakers, the underlying economic structure is essentially static, including a new-classical Phillips curve augmented with a distortionary tax and a negative externality from competitive devaluations (monetary surprises) in trading partners, and simple period-budget constraints—there is no public debt.

The benchmark case for welfare evaluations is a regime of complete monetary policy autonomy (flexible exchange rates) with politically dependent central banks. Monetary and fiscal policies are determined jointly by minimizing deviations of the effective tax rate, public expenditure, and inflation from specific objectives. Those objectives are nonnegative constants except for inflation, which fluctuates to partly accommodate Phillips-curve shocks. This captures the preferred trade-off between the variability of inflation and that of output. Finally, as in Barro and Gordon (1983), governments also care about the level of output, welcoming expansions and disliking contractions.

As usual in this literature, equilibrium policies systematically deviate from the first best, reflecting the government penchant for using monetary policy to boost activity beyond its potential—instead of raising the potential through politically costly structural reforms—and the inflationary impact of the waste of tax money levied through distortionary instruments. Overall, inflation is too high and productive public spending too low in comparison with the case in which decision makers could credibly precommit.

Monetary unification is modeled as a change of regime by which monetary policy is determined by a regional central bank, whereas fiscal policy remains in national hands. It yields benefits similar to the delegation of monetary policy to an independent central bank. Indeed, a regional monetary policy is less effective for stimulating output in each individual country because there is no expected gain from a depreciation of the national currency with respect to trading partners in the region. Centralized monetary

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1 This box was prepared by Xavier Debrun. A more detailed discussion can be found in Debrun, Masson, and Pattillo (2011).

2 A description of the model is presented in Appendix 5C.
The CMA has been the subject of an extensive literature. Van Zyl (2003) discusses the history of monetary integration in Southern Africa and prospects for its extension. Wang and others (2007) review recent developments in the CMA, identify main policy challenges for the members, and discuss implications for further economic integration. Some studies focus particularly on individual countries and their involvements in the CMA (Tjirongo, 1995; Lledo, Martijn, and Gons, 2005; Gons, 2006; and Dwight, 2006). Other papers show that the CMA does not meet the traditional criteria for an OCA, particularly given its vulnerability to asymmetric shocks and its degree of labor mobility (Cobham and Robson, 1994; Van der Merwe, 1996; Metzger, 2004; and Masson and Pattillo, 2005).

THE CMA: HISTORY, INSTITUTIONAL ARRANGEMENTS, AND ECONOMIC CONVERGENCE

This section reviews the history and institutional features of the CMA. It also looks at the state of economic convergence across member countries.

History and Institutional Arrangements

Even though the CMA arrangement formalizes the regional role of the South African rand as a means of payment, the CMA is not a full-fledged currency union. In 1921, after the establishment of the South African Reserve Bank (SARB), the South African currency (initially the pound and since 1961, the rand) effectively became the only medium of exchange and legal tender in South Africa, Bechuanaland (now Botswana), Lesotho, Namibia, and Swaziland. There were no internal restrictions on capital flows within the area, and virtually all external transactions were executed through banks located in South Africa and subject to South African exchange controls. This system was maintained after Botswana, Lesotho, and Swaziland gained independence in the 1960s and was

Appendix 5A summarizes major events in the development of the CMA.
institutionalized on December 5, 1974, with the signing of the Rand Monetary Area (RMA) Agreement. Botswana left the RMA in 1975 in favor of policy independence.\(^8\)

The RMA was revamped in April 1986 and transformed into the CMA composed of Lesotho, Swaziland, and South Africa. Under the terms of the CMA Agreement, Lesotho and Swaziland would have the right to issue their own national currencies. Swaziland introduced its currency, the lilangeni, in 1974, followed by Lesotho’s loti in 1980. Namibia, which gained independence from South Africa in 1990, formally joined the CMA two years later, and launched the Namibian dollar in 1993. The currencies of Lesotho, Namibia, and Swaziland (the LNS) have been pegged at par to the rand since their introductions, with bilateral agreements governing access to the South African foreign exchange market.

Box 5.2 summarizes key features of the CMA. The long history of monetary association and strong financial and trade linkages explain why the CMA coincides with a customs union enjoying fairly unrestricted capital mobility. This unique characteristic contrasts with two long-standing monetary unions in Africa, the Central African Economic and Monetary Community and the West African Economic and Monetary Union, where some trade restrictions persist and intraregional capital mobility, though in principle free, remains low (Masson and Pattillo, 2001).

**Economic Convergence**

A prominent characteristic of the CMA is the economic and financial weight of South Africa, which accounts for more than 90 percent of the region’s GDP and trade. Prior to the impact of the global financial crisis on the region, fiscal positions remained fairly benign, on average, although Swaziland posted fairly sizable and increasing deficits (5.6 percent of GDP on average during the period 2008–10, with 13.4 percent, on a commitment basis, during fiscal year 2010/11), while Lesotho’s public debt, at 41.5 percent of GDP, stayed well above the regional average. See Table 5.1.

Pegged exchange rates and almost free intraregional capital mobility suggest that monetary policy rates are bound to move in parallel among CMA countries (Figure 5.1), with SARB’s monetary stance being the area’s anchor. Monetary hegemony is the only possible equilibrium in a fixed exchange rate system without formal cooperation procedures to set interest rates in line with CMA-wide conditions. Although discount rates in Namibia and Swaziland have been closely aligned with the SARB repo rate, Lesotho implements monetary policy through the Treasury bill market, hence the spread observed with respect to the policy rates of the other members. As a result of monetary policy convergence, LNS benefited from South Africa’s largely successful adoption of a formal inflation-targeting framework in 2001. The convergence of inflation rates across the CMA supports the view that the area effectively functions as a currency union under the leadership of the SARB.

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\(^8\) Although Botswana left the RMA in 1975, it continued to use the rand until August 1976.
The Common Monetary Area

The CMA is an arrangement in which Lesotho, Namibia, and Swaziland (the LNS) have pegged their domestic currencies at par to the South African rand. Within the CMA, each country issues its own currency, and bilateral agreements define the states in which these currencies are legal tender. Although the South African rand is legal tender in all member countries of the CMA, the three other currencies are only legal tender in their own countries. The South African Reserve Bank (SARB) has adopted an inflation-targeting framework.

In each LNS country, the local currency and the rand are perfect substitutes, with no conversion cost, and no restrictions on funds transfers, whether for current or capital transactions. All four members of the CMA (together with Botswana) belong to the Southern African Customs Union. As a consequence, capital and goods are highly mobile across the CMA region, although further progress is needed in removing non-tariff barriers to trade. In normal times, LNS benefit greatly from goods and capital mobility because mobility gives them access to South African investments and markets. However, in times of crisis, sharp reversals in net capital flows (moving to South Africa) can strain these smaller economies. This is exacerbated by the absence of a conversion cost between the local currency and the rand.

Although all CMA members effectively share the same monetary policy, the CMA is not a full currency union. There is no common central bank conducting monetary policy for the region as a whole and pooling external reserves, and there is no formal regional surveillance of domestic policies to ensure that they remain consistent with the smooth working of the area. The exchange rate arrangements of the smaller countries under the CMA have certain characteristics of a currency board—domestic currency issues are required to be fully backed by foreign reserves (except for Swaziland). However, unlike a typical currency board, there is no restriction that the central bank of a small member country must hold domestic assets. Importantly, the one-to-one parities with the rand are not backed by irrevocable commitments such as the promise of mutual assistance in case the peg comes under pressure. The SARB may, however, make foreign exchange available to other members of the CMA. Finally, there are no fiscal transfers aimed at cushioning the impact of asymmetric shocks.

Another peculiarity of the CMA is that unlike other members, Swaziland has the option to adjust its exchange rate unilaterally. Such an adjustment would not require formal consultations with South African authorities. Additionally, Swaziland is not required to hold foreign exchange at the SARB to cover its currency in circulation, although Lesotho and Namibia are required to do so. Swaziland’s reintroduction of the rand as legal tender was done with the concurrence of the rest of CMA in 2003.

1 This box was prepared by Olivier Basdevant and Borislava Mircheva. See details of the CMA’s institutional framework in Appendix 5B.

2 The only exceptions result from the member countries’ investment or prudential liquidity requirements prescribed for financial institutions.

3 Should Swaziland decide to adjust its exchange rate, it would have to provide six months’ notice to the SARB.
### TABLE 5.1

<table>
<thead>
<tr>
<th></th>
<th>CMA</th>
<th>Memorandum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lesotho</td>
<td>Namibia</td>
</tr>
<tr>
<td>Nominal GDP (millions of U.S. dollars)</td>
<td>1,939</td>
<td>9,947</td>
</tr>
<tr>
<td>Real GDP growth rate (percent)</td>
<td>3.7</td>
<td>2.8</td>
</tr>
<tr>
<td>Inflation (percent, period average)</td>
<td>6.6</td>
<td>7.9</td>
</tr>
<tr>
<td>Fiscal balance (including grants; percent of GDP)</td>
<td>−0.8</td>
<td>−1.9</td>
</tr>
<tr>
<td>Total government debt (percent of GDP)</td>
<td>41.5</td>
<td>17.6</td>
</tr>
<tr>
<td>International reserves (months of imports)</td>
<td>5.1</td>
<td>3.8</td>
</tr>
<tr>
<td>Current account balance (percent of GDP)</td>
<td>−0.8</td>
<td>1.1</td>
</tr>
<tr>
<td>Total exports (millions of U.S. dollars)</td>
<td>870</td>
<td>4,149</td>
</tr>
</tbody>
</table>

Sources: National authorities; and IMF staff estimates.
Note: n.a. = not available.

In the absence of CMA-wide benchmarks for external reserves, the deterioration of fiscal balances in the aftermath of the global financial crisis may raise concerns about reserve adequacy. However, conventional reserve adequacy indicators are not alarming. International reserves in LNS countries covered close to three months of import. However, because the credibility of fixed parities can always be tested, reserve levels can usefully be compared to the size of base money and broad money aggregates, as is routinely done when assessing reserve adequacy in currency boards. Table 5.2 shows that Lesotho has maintained a relatively high level of reserves to cover broad money since 2008, but the ratio declined sharply in 2011. The situation in Swaziland is less benign, with reserves covering slightly less than half of broad money in 2011, which represents a dramatic deterioration since 2008. Although Namibia exhibited much lower reserve coverage ratios of broad money—a reflection of its more developed financial sector—its reserves largely exceed its short-term external debt (an indicator not available for Lesotho and Swaziland), suggesting that reserves would not come under immediate pressure if there were to be a sudden stop in capital inflows.

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1IMF (2011a) cautions against a uniform metric for reserve adequacy—including the traditional rules of thumb—across all low-income countries. In particular, the quality of the overall policy framework should play a role in the determination of optimal reserve levels.
Figure 5.1 Common Monetary Area Countries and Botswana: Central Bank, Treasury, and Inflation Rates
Sources: IMF, International Financial Statistics (panels a and b), and World Economic Outlook database (panel c).
Note: Data for Botswana on Treasury bill rates (panel b) are not available.
Although the global crisis led to a synchronized deterioration of fiscal balances in the CMA and to some convergence, LNS fiscal positions are more volatile than South Africa’s mostly because of these countries’ smaller size and lack of diversification. The revenue-sharing formula in the Southern African Customs Union (SACU) also contributed to the volatility of fiscal positions, as evidenced by considerable differences during cyclical upturns, as in 2004–07, when LNS recorded much larger surpluses than did South Africa (Figure 5.2). This allowed LNS to maintain low and relatively stable public debt levels, and for Lesotho to gradually converge to the 20–40 percent of GDP range.

### MODEL-BASED ASSESSMENTS OF THE COMMON MONETARY AREA AND VARIANTS OF IT

Is CMA participation in the best interests of its members? The DMP model can provide some elements of an answer, comparing the costs of sharing a single monetary policy—forgone stabilization—with the benefits of policy coordination brought about by fixed exchange rates. As indicated earlier, welfare effects are calculated as deviations from a hypothetical counterfactual in which each country could set its own monetary policy to maximize a weighted average of national policy objectives. The counterfactual implicitly assumes that nominal exchange

<table>
<thead>
<tr>
<th></th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011 estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gross reserves/imports</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lesotho</td>
<td>6.0</td>
<td>5.6</td>
<td>3.8</td>
<td>2.6</td>
</tr>
<tr>
<td>Namibia</td>
<td>3.8</td>
<td>4.7</td>
<td>2.8</td>
<td>2.5</td>
</tr>
<tr>
<td>Swaziland</td>
<td>4.6</td>
<td>3.9</td>
<td>2.8</td>
<td>2.3</td>
</tr>
<tr>
<td><strong>Gross reserves/short-term external debt</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lesotho</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td>Namibia</td>
<td>403</td>
<td>908</td>
<td>599</td>
<td>591</td>
</tr>
<tr>
<td>Swaziland</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td><strong>Gross reserves/base money</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lesotho</td>
<td>939</td>
<td>844</td>
<td>670</td>
<td>510</td>
</tr>
<tr>
<td>Namibia</td>
<td>542</td>
<td>636</td>
<td>312</td>
<td>274</td>
</tr>
<tr>
<td>Swaziland</td>
<td>749</td>
<td>496</td>
<td>384</td>
<td>237</td>
</tr>
<tr>
<td><strong>Gross reserves/broad money</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lesotho</td>
<td>155</td>
<td>132</td>
<td>104</td>
<td>67</td>
</tr>
<tr>
<td>Namibia</td>
<td>39</td>
<td>53</td>
<td>29</td>
<td>25</td>
</tr>
<tr>
<td>Swaziland</td>
<td>116</td>
<td>84</td>
<td>54</td>
<td>48</td>
</tr>
</tbody>
</table>

Source: National authorities; and IMF staff estimates.
Note: n.a. = Not available.

1Rand in circulation are not included as part of base money.
Figure 5.2 Countries in the Common Monetary Area and Botswana: Fiscal Balance and Total Government Debt
Sources: National authorities; and IMF staff estimates.
rates would be allowed to fluctuate and to be a key transmission channel of monetary policy. However, the specific costs related to exchange rate volatility and risks are not captured by the model. The analysis first looks at the CMA as it is and then explores the implications of other SADC member states joining the CMA. These exercises were selected for their illustrative virtues, deliberately abstracting from other relevant dimensions of integration. Finally, the analysis estimates the impact of establishing a regional central bank in which each member state would influence the common monetary policy proportionally to its economic size.

The CMA

On the cost side, what matters are the correlations of LNS terms-of-trade shocks with South Africa’s: the lower the correlation for a given country, the greater the cost entailed in the absence of monetary sovereignty. On the benefit side, the model emphasizes two key elements. The first is the intensity of intraregional trade flows. The greater they are, the greater is the externality related to uncoordinated monetary policies (for instance, leading to competitive devaluations). A monetary union shuts off this transmission channel of monetary policy, which, in turn, prevents a common central bank (CCB) from exploiting monetary policy to boost output in one country at the expense of the others. Therefore, the CCB enjoys greater anti-inflationary credibility than does a purely national institution. In addition, the CCB can more easily deflect pressures from an individual member state to provide monetary financing for that state’s budget. Note that model simulations assume an allocation of seigniorage and inflation tax revenues according to GDP shares. This allocation of seigniorage differs from the rules-based allocation under the current CMA framework. In practice, however, the induced discrepancies between the formula-based and the GDP-share revenues are too small (about ½ percentage point of GDP for Lesotho, for instance) to be significant for these welfare comparisons.

To account for the leadership role of the SARB in setting the area-wide monetary stance, this analysis calibrates the CCB such that LNS have no influence. In this scenario, the hypothetical SARB has no incentive to seek competitive devaluations vis-à-vis other CMA countries, which lowers the credible inflation rate. However, SARB is not better insulated from eventual pressures to raise the inflation tax than if it sets monetary policy for South Africa only. Likewise, LNS central banks boost their anti-inflationary credibility because they cannot use devaluations in a strategic fashion, but in addition, the CMA arrangement—assuming that it is in itself fully credible—perfectly insulates local monetary

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10 This chapter considers two cases: (1) the SARB chooses monetary policy for the whole area, and (2) a CCB weighs the welfare of South Africa and LNS countries proportionally to their economic size.

11 Pastor and Ramirez (2012) find that in international comparisons, the revenues from seigniorage in the CMA countries and Botswana are less than one-fourth of what generally accrues to governments in countries with similar rates of inflation.
conditions from LNS budget financing considerations. For LNS, CMA membership thus represents a powerful tool to cement their commitment to price stability.

Key inputs for the model simulations are summarized in Table 5.3. Low terms-of-trade correlations of LNS with South Africa as well as generally more volatile terms of trade point to nonnegligible costs related to the absence of monetary sovereignty for these countries. At the same time, LNS are generally more open to trade—particularly with South Africa—and have larger “financing needs” from the budget, suggesting that gains in anti-inflationary credibility are likely to be large.

As anticipated, the costs arising from shock asymmetry are meaningful—a permanent decline of per capita income equal to 0.3–0.5 percent. Because the CCB/SARB now sees monetary policy as less effective than if exchange rates with LNS were floating, the inflationary bias inherent to its incentive to stimulate production beyond potential is smaller. The overall welfare effect from the monetary externality is by construction the same (0.46 percent) for all countries; and with the exception of Swaziland, it is large enough to offset the costs of a one-size-fits-all monetary policy. For South Africa, the anchor of the CMA, this credibility effect is, in fact, the only determinant of net gain because the equilibrium inflation tax and response to shocks are the same as under monetary sovereignty. LNS can count on a third, and quantitatively much larger, benefit: a credible CMA arrangement insulates their central banks from the pressure to finance strained budgets by raising the inflation tax. The magnitude of the gains—in the range of 2 to 6 percent in permanent per capita income—reflects the very high equilibrium inflation tax rates found by the model under the assumption of monetary sovereignty. This is rooted in a greater estimated appetite for public spending as well as weaker economic governance (and heightened likelihood of waste). For instance, the model estimates that Lesotho’s financing need is twice as large as South Africa’s.

<table>
<thead>
<tr>
<th>Countries in the Common Monetary Area: Key Model Inputs, 1994–2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>**TOT correlations</td>
</tr>
<tr>
<td>Lesotho</td>
</tr>
<tr>
<td>Namibia</td>
</tr>
<tr>
<td>South Africa</td>
</tr>
<tr>
<td>Swaziland</td>
</tr>
<tr>
<td><strong>Memorandum</strong></td>
</tr>
<tr>
<td>Botswana</td>
</tr>
</tbody>
</table>

Source: Authors’ calculations.

Note: FN = financing need; M = imports; TOT = terms of trade; X = exports.

¹Financing need estimates the resources required to finance the socially optimal level of productive (welfare-generating) public spending. FN therefore combines measures of the desired level of productive public spending and waste. The methodology to capture these unobservable variables is discussed in Debrun, Masson, and Pattillo (2011). Underlying data reflect 1994–2005 averages to exclude the large changes in fiscal variables observed around the global financial crisis.

The model simulations reflect trade intensities from a bilateral trade matrix using the IMF Direction of Trade Statistics.
Overall, the model’s estimates of the permanent per capita income gains due to the CMA are significant: 6.1 percent for Lesotho, 2.1 percent for Swaziland, 1.8 percent for Namibia, and 0.5 percent for South Africa.

Hypothetical Expansions of the Common Monetary Area

A natural question at this stage is whether expanding the membership of a mutually beneficial arrangement such as the CMA would make sense both for existing members and for potential newcomers. For illustrative purposes, the universe of potential newcomers among countries of the SADC member states is used—with the exceptions of Seychelles and Madagascar because of gaps in data. The main appeal of SADC as the focus group for these simulations is that it is a large and heterogeneous club to which all CMA countries belong. Although SADC has plans to put in place a monetary union, the horizon is distant and subject to considerable uncertainty. Moreover, one of its members, Tanzania, has already committed to participating in a monetary union with other members of the East African Community, whereas Botswana has shown no interest in joining a monetary union. To shed light on the strategic dimension of integration, the analysis proceeds in two steps: first, it expands the existing CMA one country at a time and assesses the welfare impact; second, it introduces potential members all at once.

Adding a Single Country to the Existing CMA: Who Gains, Who Loses?

SADC comprises a large and diverse group of countries. However, even in this broader area, South Africa’s economy remains by far larger than all the others combined (it makes up more than 70 percent of SADC’s GDP). As Table 5.5 illustrates, countries differ widely in the key dimensions of this model: terms-of-trade

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**TABLE 5.4**

<table>
<thead>
<tr>
<th>Common Monetary Area: Welfare Gains and Losses (Percent of GDP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Welfare gain</td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>Lesotho</td>
</tr>
<tr>
<td>Namibia</td>
</tr>
<tr>
<td>South Africa</td>
</tr>
<tr>
<td>Swaziland</td>
</tr>
</tbody>
</table>

Source: Authors’ calculations.

Note: FN = financing need; FNA = average financing need. It is assumed that South Africa sets monetary policy for the Common Monetary Area.

1In percent.

2Compared with South Africa’s terms-of-trade shock and financing need, respectively, in percent.

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13 The plan is outlined in the SADC Regional Indicative Strategic Development Plan. It envisages a common market by 2015 and a common currency by 2018.
correlations and volatilities, government financing needs, and intensities of intra-regional trade linkages. Given the results above, one could again expect that financing needs will ultimately shape a given country’s willingness to join and the existing CMA members’ incentive to welcome it. The very large dispersion of financing needs reflects highly heterogeneous institutional environments. Tanzania and all CMA members except Lesotho have relatively low financing needs, in sharp contrast with Angola, Lesotho, and Zimbabwe. Correlations of terms-of-trade shocks are generally low or negative, again pointing to significant costs of monetary unification, when compared with the hypothetical benchmark case of monetary sovereignty. That is, relying exclusively on OCA criteria to analyze the desirability of a larger CMA would likely cause the idea to be dismissed out of hand.

A number of interesting results emerge from the exercise (Table 5.6). First, all CMA members appear to benefit—albeit marginally in many cases—from the membership of any other individual SADC country provided the SARB continues to set monetary policy for the enlarged CMA. Second, three potential candidates for CMA membership would lose out from joining on their own initiative: Angola, Mauritius, and Tanzania. These three countries would clearly suffer from having to adopt South Africa’s monetary policy because their terms-of-trade shocks are orthogonal to or negatively correlated with South Africa’s. In Angola and Mauritius, terms of trade are also extremely volatile, making a national monetary policy desirable. These are prominent cases in which OCA arguments dominate credibility considerations. For Mauritius—and to a lesser extent, Tanzania—the loss would be aggravated by the likelihood that the CMA-wide inflation tax would exceed what the model describes as optimally required to cover their relatively low financing needs.

The greatest winners among potential new entrants would be Botswana, Zambia, and Zimbabwe. All three countries would benefit significantly from a lower inflation rate because fiscal pressures on their monetary policies would be lower. In Botswana and Zambia, positive terms-of-trade correlations also help contain the costs from no longer having their own monetary policy to stabilize output in the face of shocks. These hypothetical gains and losses also depend importantly on estimated financing needs, and can change over time as countries adopt fiscal reforms relieving pressures on their monetary policies. Conversely, South Africa, the anchor for the CMA, could see its finances deteriorate to the point of nullifying the hypothetical gains calculated here for other countries.

14 For Botswana, the largest component of welfare gains is due to the fiscal asymmetry (1.76 percent of GDP) with moderate gains due to monetary externalities (0.79 percent) offset only partially by the welfare loss associated with asymmetry in terms-of-trade shocks (0.25 percent).

15 Kramarenko and others (2010) review pros and cons of alternative monetary regimes for Zimbabwe, including the possibility of joining the CMA. The paper also provides a welfare analysis of Zimbabwe’s participation in CMA and predicts that existing members’ welfare would fall marginally by about ½ percent of CMA GDP. Zimbabwe, however, would gain more than 24 percent of GDP, with most of the gain stemming from the fiscal externality. Differences between the current results and previous ones are the result of a significant reduction in Zimbabwe’s estimated financing need, which reduces the necessary inflation tax.
# TABLE 5.5

Countries in the Southern African Development Community (SADC): Selected Indicators, 1994–2010

<table>
<thead>
<tr>
<th>CMA members</th>
<th>TOT correlations with South Africa</th>
<th>FN¹</th>
<th>Standard deviation of TOT shocks</th>
<th>Openness: (0.5(X + M)/GDP)</th>
<th>Adjusted standard deviation of TOT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lesotho</td>
<td>28.17</td>
<td>66.55</td>
<td>2.42</td>
<td>76.55</td>
<td>1.85</td>
</tr>
<tr>
<td>Namibia</td>
<td>20.52</td>
<td>41.55</td>
<td>3.83</td>
<td>45.28</td>
<td>1.73</td>
</tr>
<tr>
<td>South Africa</td>
<td>100.00</td>
<td>33.34</td>
<td>1.43</td>
<td>27.34</td>
<td>0.39</td>
</tr>
<tr>
<td>Swaziland</td>
<td>9.32</td>
<td>44.43</td>
<td>2.78</td>
<td>81.73</td>
<td>2.27</td>
</tr>
<tr>
<td>Other SADC members</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Angola</td>
<td>−0.84</td>
<td>57.79</td>
<td>10.08</td>
<td>72.51</td>
<td>7.31</td>
</tr>
<tr>
<td>Botswana</td>
<td>36.06</td>
<td>42.17</td>
<td>3.95</td>
<td>42.83</td>
<td>1.69</td>
</tr>
<tr>
<td>Congo, Dem. Rep. of</td>
<td>24.25</td>
<td>37.56</td>
<td>5.86</td>
<td>35.38</td>
<td>2.07</td>
</tr>
<tr>
<td>Malawi</td>
<td>−25.55</td>
<td>46.71</td>
<td>9.54</td>
<td>34.83</td>
<td>3.32</td>
</tr>
<tr>
<td>Mauritius</td>
<td>−18.49</td>
<td>27.58</td>
<td>7.31</td>
<td>58.81</td>
<td>4.30</td>
</tr>
<tr>
<td>Mozambique</td>
<td>28.03</td>
<td>42.58</td>
<td>2.42</td>
<td>32.57</td>
<td>0.79</td>
</tr>
<tr>
<td>Seychelles</td>
<td>14.48</td>
<td>10.29</td>
<td>85.35</td>
<td>8.78</td>
<td></td>
</tr>
<tr>
<td>Tanzania</td>
<td>−32.52</td>
<td>31.06</td>
<td>5.29</td>
<td>23.08</td>
<td>1.22</td>
</tr>
<tr>
<td>Zambia¹</td>
<td>28.09</td>
<td>46.58</td>
<td>7.55</td>
<td>36.43</td>
<td>2.75</td>
</tr>
<tr>
<td>Zimbabwe²</td>
<td>−25.30</td>
<td>52.14</td>
<td>2.37</td>
<td>39.50</td>
<td>0.94</td>
</tr>
</tbody>
</table>

Source: Authors' estimates.

Note: CMA = Common Monetary Area; FN = financing need; M = imports; TOT = terms of trade; X = exports. Seychelles is omitted from the calculations because its high per capita income gives implausible figures for its FN variable.

¹Data from 1994–2005

²Data from 1999–2010.

³Data from 1999–2007.
## TABLE 5.6
Welfare Gains or Losses from Adding a Single SADC Country to the CMA
(Percent of GDP)

<table>
<thead>
<tr>
<th>Country</th>
<th>Angola</th>
<th>Botswana</th>
<th>Congo, Dem. Rep. of Malawi</th>
<th>Mauritius</th>
<th>Mozambique</th>
<th>Tanzania</th>
<th>Zambia</th>
<th>Zimbabwe¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lesotho</td>
<td>0.02</td>
<td>0.25</td>
<td>0.02</td>
<td>0.05</td>
<td>0.09</td>
<td>0.01</td>
<td>0.08</td>
<td>0.20</td>
</tr>
<tr>
<td>Namibia</td>
<td>0.03</td>
<td>0.31</td>
<td>0.03</td>
<td>0.06</td>
<td>0.11</td>
<td>0.01</td>
<td>0.10</td>
<td>0.25</td>
</tr>
<tr>
<td>South Africa</td>
<td>0.03</td>
<td>0.33</td>
<td>0.03</td>
<td>0.06</td>
<td>0.12</td>
<td>0.02</td>
<td>0.10</td>
<td>0.26</td>
</tr>
<tr>
<td>Swaziland</td>
<td>0.03</td>
<td>0.31</td>
<td>0.03</td>
<td>0.06</td>
<td>0.11</td>
<td>0.01</td>
<td>0.10</td>
<td>0.24</td>
</tr>
<tr>
<td>Angola</td>
<td>−0.29</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Botswana</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Congo, Dem. Rep. of Malawi</td>
<td>0.93</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mauritius</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>−2.56</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mozambique</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.32</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tanzania</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>−0.18</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zambia</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zimbabwe</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4.11</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Authors’ calculations.

Note: CMA = Common Monetary Area; SADC = Southern African Development Community. Monetary policy is assumed to be set by South Africa. Welfare is relative to monetary autonomy for new entrants, and to CMA for existing members.

¹The Zimbabwe exercise is based on data up to 2007 and, as a result, the estimated gains owing to low inflation from participating in the CMA are measured relative to the monetary policy pursued before dollarization in 2009. Benefits from low inflation would be smaller with unchanged moderate gains due to monetary externality if Zimbabwe were to join the CMA.
Expanding the CMA Arrangement to All SADC Countries

The logic of the DMP model suggests that a block expansion could be more desirable than piecemeal monetary integration. To illustrate this property of the model, the results in Table 5.7 indicate that only Mauritius would remain a net loser from CMA membership, essentially for the same reasons as above. For Angola and Tanzania, notably, joining the CMA with all other SADC countries at the same time would yield net benefits, whereas joining the CMA alone would not. As the decomposition of welfare effects shows, the determining factor between the two integration strategies is that the credibility effect associated with a single monetary policy is quite sizable (in excess of 1.3 percent of permanent per capita consumption for SADC candidates and about 0.9 percent for existing CMA members).

HEGEMONY VERSUS A REGIONAL CENTRAL BANK

So far, the analysis has assumed that CMA monetary policy would continue to be determined by the current rules of the game, giving the SARB explicit monetary hegemony. However, as integration proceeds, the commitment to a regional monetary union could be further cemented by the establishment of a regional central bank in which each member would have a voice. Specifically, scenarios are simulated in which a regional central bank sets the common monetary policy to maximize a weighted average of individual welfare functions, using country shares in regional GDP as weights. The analysis first quantifies the welfare impact on existing CMA members to move toward such a model, and then revisits the effect of a regional CCB in the context of the greater SADC currency union.

A Full Common Monetary Union with Current Members

The simulations reported in Table 5.8 suggest that under the current calibration of the model—which reflects past data—no CMA member would benefit from a CCB replacing the SARB. The gains associated with a more stabilizing monetary policy for LNS would be more than offset by LNS governments’ pressures on the CCB to raise the inflation tax. By definition, there could not be any additional gain resulting from policy coordination because exchange rates are already fixed. Admittedly, these effects are very small, and fall well within reasonable margins of error related to the uncertainty surrounding the model’s calibration. The overwhelming influence of South Africa’s economic conditions on the region is such that there would arguably be little difference between the current, explicitly hegemonic model and a regional CCB. Moreover, that particular comparison can be sensitive to certain limitations of the model. As mentioned earlier, the DMP framework does not capture some potential benefits of establishing a monetary union, including the presumed elimination of currency risk and the greater induced convergence of nominal interest rates. Also, specific guarantees on the political independence of the CCB could better insulate it from the influence of fiscally profligate countries and could conceivably be a precondition imposed by the anchor of a fixed exchange rate system before moving to a full-fledged monetary union (Debrun, 2001).
<table>
<thead>
<tr>
<th>Country</th>
<th>Welfare gain</th>
<th>Monetary externality</th>
<th>Fiscal asymmetry</th>
<th>Shock asymmetry</th>
<th>GDP share (Percent)</th>
<th>Shock correlation¹</th>
<th>FNA/FN¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angola</td>
<td>0.42</td>
<td>1.35</td>
<td>4.59</td>
<td>−5.29</td>
<td>5.07</td>
<td>−0.84</td>
<td>57.70</td>
</tr>
<tr>
<td>Botswana</td>
<td>2.77</td>
<td>1.35</td>
<td>1.76</td>
<td>−0.25</td>
<td>2.99</td>
<td>36.06</td>
<td>79.07</td>
</tr>
<tr>
<td>Congo, Dem. Rep. of</td>
<td>1.77</td>
<td>1.35</td>
<td>0.85</td>
<td>−0.40</td>
<td>2.68</td>
<td>24.25</td>
<td>88.76</td>
</tr>
<tr>
<td>Lesotho</td>
<td>0.68</td>
<td>0.89</td>
<td>0.00</td>
<td>0.00</td>
<td>0.43</td>
<td>28.17</td>
<td>50.10</td>
</tr>
<tr>
<td>Malawi</td>
<td>2.67</td>
<td>1.35</td>
<td>2.62</td>
<td>−1.17</td>
<td>0.97</td>
<td>−25.35</td>
<td>71.38</td>
</tr>
<tr>
<td>Mauritius</td>
<td>−1.70</td>
<td>1.35</td>
<td>−1.21</td>
<td>−1.90</td>
<td>0.62</td>
<td>−18.49</td>
<td>120.91</td>
</tr>
<tr>
<td>Mozambique</td>
<td>3.04</td>
<td>1.35</td>
<td>1.84</td>
<td>−0.06</td>
<td>1.95</td>
<td>28.03</td>
<td>78.30</td>
</tr>
<tr>
<td>Namibia</td>
<td>0.84</td>
<td>0.89</td>
<td>0.00</td>
<td>0.00</td>
<td>1.96</td>
<td>20.52</td>
<td>80.25</td>
</tr>
<tr>
<td>South Africa</td>
<td>0.89</td>
<td>0.89</td>
<td>0.00</td>
<td>0.00</td>
<td>71.61</td>
<td>100.00</td>
<td>100.00</td>
</tr>
<tr>
<td>Swaziland</td>
<td>0.92</td>
<td>0.89</td>
<td>0.00</td>
<td>0.00</td>
<td>0.79</td>
<td>9.32</td>
<td>75.04</td>
</tr>
<tr>
<td>Tanzania</td>
<td>0.71</td>
<td>1.35</td>
<td>−0.47</td>
<td>−0.19</td>
<td>4.54</td>
<td>−32.52</td>
<td>107.33</td>
</tr>
<tr>
<td>Zambia</td>
<td>3.12</td>
<td>1.35</td>
<td>2.59</td>
<td>−0.70</td>
<td>1.88</td>
<td>28.09</td>
<td>71.58</td>
</tr>
<tr>
<td>Zimbabwe</td>
<td>4.66</td>
<td>1.35</td>
<td>3.61</td>
<td>−0.12</td>
<td>4.52</td>
<td>−25.30</td>
<td>63.95</td>
</tr>
</tbody>
</table>

Source: Authors’ calculations.

Note: CMA = Common Monetary Area; FN = financing need; FNA = average financing need; SADC = Southern African Development Community. South Africa is assumed to set monetary policy. Welfare is relative to monetary autonomy for new entrants, and to CMA for existing members.

¹With respect to the union’s average shocks and financing need (FNA), respectively, in percent.
A Larger Currency Union with SADC Members

The set of net beneficiaries of a larger SADC currency union under a regional CCB is the same as if SARB maintained its leadership position: only Mauritius would have no interest in joining the union. Quantitatively, however, an SADC union with a regional central bank would spread the losses from a one-size-fits-all monetary policy across virtually all countries, confirming that SADC is not an OCA in the traditional sense. Also, existing CMA members would now lose out from the larger inflation tax imposed by the participation of the more profligate members of the SADC. The net result is that current CMA members would gain little, if anything, from a larger SADC currency union under a regional central bank.

CONCLUSION

Model simulations shed new light on incentives to form currency unions in a context in which central banks internalize the government budget constraint, pointing to three broad policy implications:16

- In line with the traditional OCA literature, DMP simulations suggest that the costs of a one-size-fits-all monetary policy can be significant if external shocks affecting individual economies are large and uncorrelated with the rest of the region (e.g., Bayoumi and Ostry, 1997). The model suggests that CMA countries thus benefit from their monetary association because it provides large offsetting gains in policy credibility and macroeconomic stability.

- Although the model captures the value of a rand anchor for the CMA, a regional CCB conducting policy on the basis of area-wide averages would still appear to be more beneficial than full monetary autonomy. This shows

that regardless of specific institutional guarantees on the independence of the CCB, monetary unification per se can deliver major credibility gains. By the same token, moving toward a regional CCB would likely require that all parties prefer such guarantees to the existing arrangement.

- Mechanisms alleviating the costs of currency unions with regard to inefficient shock stabilization could help, particularly in the context of an expansion of the CMA. In scenarios explored above, shock asymmetry—which makes unionwide monetary policy inadequate—can be quite costly in some cases, pointing to the importance of more-countercyclical fiscal policies and ultimately, risk-sharing mechanisms. Agreeing to and implementing an effective transfer system would pose important challenges for a heterogeneous grouping of countries like SADC; however, these issues are beyond the scope of this chapter.

The simulations further suggest that the current monetary arrangement is beneficial for all CMA members, including South Africa. Lesotho and Swaziland gain the most because the CMA insulates their monetary policies from fiscal pressures. The potential gains of expanding the CMA to SADC countries depend on the strategy. If current SADC countries were to join the CMA together, all of them except Mauritius could be better off. However, Angola, Mauritius, and Tanzania would lose out from individual membership because Angola is subject to large idiosyncratic disturbances and Mauritius and Tanzania already have strong fiscal policies.

The creation of a genuine CMA-wide monetary union with a regional central bank carries some costs in forgone anti-inflationary credibility because the model assumes that fiscally profligate countries could have some influence over monetary policy and extract a marginally higher inflation tax. All members would therefore be better off maintaining the current CMA regime. Furthermore, if this monetary union were enlarged to be SADC-wide with a regional central bank, all members except Mauritius would receive benefits, but the gains for existing CMA members—compared with the existing arrangement—are likely to be negligible, falling well within plausible margins of error.
**APPENDIX 5A. HISTORY OF THE COMMON MONETARY AREA**

**TABLE 5A.1**

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1974</td>
<td>Lesotho, South Africa, and Swaziland signed the Rand Monetary Area (RMA) treaty. Swaziland established a monetary authority and issued its own national currency, the lilangeni, pegged at par to the rand. Botswana did not sign the RMA agreement: it had withdrawn from the negotiations in September.</td>
</tr>
<tr>
<td>1975–76</td>
<td>Botswana established a central bank, and replaced the rand at par with its own national currency, the pula.</td>
</tr>
<tr>
<td>1980</td>
<td>Lesotho established a central bank and issued its own national currency, the loti, pegged at par with the rand.</td>
</tr>
<tr>
<td>1986</td>
<td>Lesotho, South Africa, and Swaziland signed the CMA Trilateral Agreement to replace the RMA, making additional provisions regarding the capital account, intra-CMA fund transfers, and seigniorage compensation. Swaziland discontinued the use of the rand as legal tender alongside the lilangeni.</td>
</tr>
<tr>
<td>1989</td>
<td>The CMA was amended, removing exchange restrictions resulting from limitations on conversion of balances upon termination of the monetary agreement or the withdrawal of one party.</td>
</tr>
<tr>
<td>1992</td>
<td>Following its independence from South Africa, Namibia formally joined the CMA. The Multilateral Agreement replaced the Trilateral Agreement.</td>
</tr>
<tr>
<td>1993</td>
<td>Namibia initiated issuing its own national currency, the dollar, pegged at par to the rand.</td>
</tr>
<tr>
<td>2003</td>
<td>Swaziland reauthorized use of the rand as legal tender.</td>
</tr>
</tbody>
</table>
APPENDIX 5B. INSTITUTIONAL FRAMEWORK OF THE COMMON MONETARY AREA

Wang and others (2007) provide a comprehensive summary of the institutional framework of the CMA as follows.

Currency Arrangement

Article 2 of the CMA (Multilateral) Agreement gives the three small member countries the right to issue national currencies, and their bilateral agreements with South Africa define the areas where their currencies are legal tender. The local currencies issued by the three members are legal tender only in their own countries. The South African rand, however, is legal tender throughout the CMA. The bilateral agreements also require LNS to permit authorized dealers within their territories to convert, at par, notes issued by their central banks or the South African Reserve Bank (SARB) without restriction and subject only to normal handling charges.

Under the Lesotho–South Africa and Namibia–South Africa bilateral agreements, the central banks of Lesotho and Namibia are required to maintain foreign reserves at least equivalent to the total amount of local currencies they issue. Such reserves may comprise the central bank’s holdings of rand balances, the rand currency the central bank holds in a Special Rand Deposit Account with the SARB, South African government stock (up to a certain proportion of total reserves), and investments in the Corporation for Public Deposit in South Africa.

Movements of Funds within the CMA

Under the terms of the CMA Agreement (Article 3), no restrictions can be imposed on the transfer of funds, whether for current or capital transactions, to or from any member country. The only exceptions result from the member countries’ investment or liquidity requirements prescribed for financial institutions. The small member countries view investment and liquidity requirements as a measure of savings mobilization for development purposes. The regulations requiring the investment of funds by financial institutions in domestic securities or credits to local businesses or individuals are, in effect, minimum local asset requirements. These regulations are meant to address the concern of the three small, less developed, CMA members that funds generated in their territories and deposited with local financial institutions tended to flow to the more developed capital markets of South Africa.

17 Swaziland suspended the use of the rand as legal tender in 1986 despite the fact that the rand continued to be widely accepted in the country. In the fall of 2003, the Swazi authorities re-authorized the use of the rand as legal tender alongside the lilangeni.

18 This provision was not included in the Swaziland–South Africa bilateral agreement of April 1986, in part for reasons detailed in note 17. However, the Central Bank of Swaziland has maintained foreign reserves larger than the total amount of local currencies it issued throughout the past two decades.
Access to South African Financial Markets

The CMA Agreement provides for the three small member countries to have access to the South African capital and money markets, but only through prescribed investments or approved securities that can be held by financial institutions in South Africa, in accordance with prudential regulations in Lesotho, Namibia, and Swaziland (LNS). The terms and timing of such issues are subject to consultation and agreement with the South African government, and the issues have the same rating as South African municipal bonds. As for the short-term money market, there are no regular arrangements for the taking up in South Africa of treasury bills issued by LNS. However, the CMA Agreement recognizes the right of the other member countries, in special circumstances, to enter into bilateral negotiations with South Africa to obtain temporary central bank credit.

Gold and Foreign Exchange Transactions

Although LNS have the right to authorize foreign transactions of local origin, and are responsible for doing so, the CMA Agreement (Article 5) requires their exchange control regulations to be—in all material aspects—similar to those in effect in South Africa. Gold and foreign exchange receipts of residents are subject to a surrender requirement. There are no exchange restrictions on current international transactions and for nonresidents.

Compensation Payments

Since the rand is legal tender in all CMA countries (but the currencies of the three small CMA members are not legal tender in South Africa), South Africa compensates them for forgone seigniorage. Compensation is based on a formula equal to the products of (1) two-thirds of the annual yield on the most recently issued long-term South African government stock, and (2) the volume of rand estimated to be in circulation in the member country concerned. The ratio of two-thirds was established on the assumption that it approximated the yield of a portfolio of reserve assets comprising both long-term and short-term maturities, assuming that the average yield would be less than the full long-term yield.

Consultation and Other Provisions

To facilitate implementation of the CMA Agreement, the member countries have established a commission in which each of them has one representative (along with advisors as needed). The commission holds regular consultations—at least once a year—with the aim of reconciling the interests of member countries on common issues pertaining to monetary and foreign exchange policies. It also convenes at other times at the request of a member country. Article 9 of the CMA Agreement provides for the establishment of a tribunal to arbitrate disputes that might arise between member countries regarding the interpretation or application of the agreement.
## APPENDIX 5C. DESCRIPTION OF THE DMP MODEL

### National Policymaking

**Phillips curve with regional spillovers**

\[ y_i = y_n + c \left( \pi_i - \pi_n^* - \tau_i \right) - \sum_{k=1}^{n} \theta_{ik} c \left( \pi_k - \pi_n^* \right) + e_i, \quad i = 1, \ldots, n \]  

(5.1)

**Government budget constraint (no debt)**

\[ g_i = \bar{p}_i + \mu \pi_i + \tau_i - \delta_i \]  

(5.2)

**Government utility function**

\[ U_i^a = \frac{1}{2} \left( -a (\pi_i - \bar{\pi})^2 - b \tau_i - \gamma g_i \right)^2 + \gamma \]  

(5.3)

**Trade-off between output and inflation variability**

\[ \tilde{\pi}_i = -\eta e_i, \quad \text{with } \eta > 0 \]  

(5.4)

### Supranational Monetary Policy

**Phillips curve faced by the common central bank for each member of } M**

\[ y_i = y_n + c \left( 1 - \theta_i^M \right) \left( \pi_i - \pi_n^* \right) - c \tau_i - \sum_{k \in M} \theta_{ik} c \left( \pi_k - \pi_n^* \right) + e_i, \]  

\( \forall i \in M \), with \( \theta_i^M = \sum_{k \in M} \theta_{ik} \)  

(5.1')

### Key Variables and Parameters

- \( \pi_i \): Inflation rate in country \( i \). A superscript \( e \) designates a rationally expected value.
- \( y_i \): Logarithm of output in country \( i \).
- \( y_n \): Logarithm of the natural level of output at zero taxation. Without loss of generality, the analysis assumes \( y_n = 0 \).
- \( \tau_i \): Corporate income tax rate (also tax revenues in percentage of output).
- \( \theta_{ik} \): Marginal effect of monetary policy in country \( k \) on output in country \( i \).
- \( e_i \): Terms-of-trade shock (zero-mean, transitory, and with finite variance).
- \( g_i \): Socially beneficial government expenditure in percentage of output.
- \( \mu \): Inflation tax base in percentage of output.
- \( \bar{p}_i \): Permanent nontax revenue from natural resource endowment in percentage of output.
- \( \delta_i \): Funds diverted from socially beneficial government expenditure in percentage of output.
- \( \eta \): Relative preference for output stability against inflation stability.

Note: Complete solutions are available from the authors upon request.
Inflation Rates under Alternative Monetary Regimes

<table>
<thead>
<tr>
<th>Monetary regime</th>
<th>Equilibrium inflation (country ( i ))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autonomy</td>
<td>( \pi^*_i = \pi^{**}_i + \frac{\gamma b}{\Lambda} \delta_i + \frac{(b + \gamma)}{\Lambda} c ) (5.5)</td>
</tr>
</tbody>
</table>

...while the socially optimal rate is...

\[
\pi^{**}_i = \frac{\gamma b}{\Lambda} \left( \tilde{g}_i - \tilde{p}_i \right) + \frac{\gamma \mu}{\Lambda} c - \frac{a(b + \gamma) \eta}{\Lambda} c_i, \quad (5.6)
\]

with \( \Lambda = a(b + \gamma) + \gamma \mu b > 0 \)

...so that the inflation bias is...

\[
\pi^*_i - \pi^{**}_i = \frac{(b + \gamma)}{\Lambda} c + \frac{\gamma \mu b}{\Lambda} \delta_i \quad (5.7)
\]

Monetary union \( M \) (utilitarian common central bank)

\[
\pi_i^M = \frac{\gamma b}{\Lambda} \left( FN_i^M \right) + \frac{(1-\theta_i^M)(b + \gamma) + \gamma \mu}{\Lambda} c - \frac{a(b + \gamma) \eta}{\Lambda} E_i^M,
\]

for all \( i \in M \) with \( x_i^M = \sum x_i \), for \( x \in \{ FN, \theta, \epsilon \} \)

(cross-country, output-weighted averages within \( M \), and \( FN_i = \tilde{g}_i + \tilde{\delta}_i - \tilde{p}_i \). Hence,

\[
\pi_i^M = \pi^*_i - \frac{\theta_i^M (b + \gamma)}{\Lambda} c
\]

Legally independent national central banks

\[
\pi^*_i = \pi^{**}_i + \frac{\lambda_i (b + \gamma)}{\Lambda} c + \frac{\gamma \mu (b - (1-\lambda_i) \gamma)}{\Lambda} \delta_i \quad (5.9)
\]

with \( 0 \leq \lambda_i \leq 1 \), the extent of political interference. If \( \lambda_i = 0 \) the government has no influence on the central bank’s decisions; and if \( \lambda_i = 1 \), the government effectively sets monetary policy (see equation 5.5).
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CHAPTER 6

Closing the Jobs Gap in the Southern African Customs Union

LAMIN Y.M. LEIGH AND IMELDA M. FLORES VAZQUEZ

The Southern African Customs Union (SACU) region is facing an unemployment crisis of enormous proportions. Available statistics indicate that the official unemployment rate in SACU is between 20 and 50 percent and is largely a youth phenomenon (Figure 6.1). To provide jobs for those now jobless and for new entrants to the labor force, SACU members would have to increase employment by an estimated 10 million full-time positions over the period 2012–21. Even this increase would leave the ratio of employment to the working-age population at below 50 percent—lower than that currently observed in many other countries.

How did SACU’s unemployment situation become so dire, given that, by and large, its member countries have registered reasonably strong GDP growth in recent decades? What are the characteristics of labor markets in SACU and how do these characteristics affect job creation in the region? Has the education system in SACU delivered the skills that are in demand in the labor market? What has been the impact of unions and the centralized wage bargaining system in SACU on labor market outcomes? Have demographic pressures played a role? What does the ongoing structural economic transformation in SACU bode for job creation?

Using a combination of empirical techniques and country case studies, this chapter pulls together various strands to distill key messages for policymakers in the region on how best to close the huge jobs gap.

The diversity of the economies in SACU precludes a simple solution to the unemployment problem. SACU’s labor markets are fairly segmented, and this duality arises from a combination of formal and informal sectors, urban and rural labor markets, and a “good jobs sector” and a “bad jobs sector.” Employment in the good jobs sector is usually rationed—wages are institutionally set above the competitive market-clearing level because firms set “efficiency wages,” whereas the unemployed or underemployed remain in the bad jobs sector. Factors such as minimum wages, strong unions in SACU, and the insider-outsider phenomenon

1The insider-outsider theory is related to the conflict of interest between insiders and outsiders in the labor market. “Insiders” are incumbent employees whose positions are protected by labor turnover costs. “Outsiders” enjoy no such protection; they could be unemployed or working in the informal, competitive sectors of the labor market.
have contributed to further duality in the labor market. This chapter’s preliminary findings suggest that no single available measure can address the unemployment problem in SACU. Only a combination of carefully designed initiatives, including prudent wage policies, measures to address the skills mismatch in the labor market, and faster growth, is likely to make significant inroads in unemployment.

The rest of the chapter is organized as follows. The next section summarizes the main features of the unemployment data, and is followed by a section that presents the empirical analysis of the factors that could explain the high level of structural unemployment in SACU countries. This section also analyzes the empirical relationship between unemployment and income inequality in SACU countries and discusses the implications for inclusive growth policies. The final section summarizes the policy messages and offers concluding remarks.

**THE UNEMPLOYMENT DATA**

This section examines the unemployment data in SACU and other selected regions in sub-Saharan Africa (SSA) and summarizes the key features. The cross-country analysis includes SACU, other regions in SSA, and a selected group of countries outside SSA that provide insight into structural unemployment issues. Given the weaknesses prevalent in labor market data in SSA, the discussion first
summarizes a few observations from the cross-country unemployment data. The data are based on three different sources:

- the World Bank’s World Development Report (WDR) database;
- labor force and household surveys of individual countries; and
- the out-of-employment/population ratios computed from the International Labor Organization’s (ILO’s) database (calculated as the proportion of the population between 14 and 65 years old that is currently without a job). This measure counts students, stay-home spouses, discouraged job seekers, and all individuals not willing or able to work. Although imprecise, this measure captures both the willingness to work on the part of individuals and willingness to hire by firms.

The unemployment data (Figure 6.2) yield seven key observations:

- The unemployment rates in WDR vary significantly from the estimated out-of-employment rates for both SACU and other regions in SSA, thus highlighting the weaknesses of the unemployment statistics across the region.
- Almost all data sources show that the unemployment rates in SACU are the highest in SSA (Figure 6.3) followed by those of natural-resource-rich economies. The non–natural-resource-rich economies in sub-Saharan Africa have, on average, lower unemployment rates. The analysis conducted for this chapter of labor force surveys and their quality suggests that unemployment is better measured in SACU, which could partly explain why the unemployment rates are higher in SACU than in other regions of SSA.
- Youth unemployment rates in SACU are about twice the average official unemployment rates. Labor force surveys also show that, on average, about 40 percent of the unemployed in SACU are long-term unemployed (unemployed for six months or longer).
- The structure of labor markets in SACU tends to be somewhat different from labor markets in other parts of SSA. With the exception of Botswana and Lesotho, the average portion of the labor force in the agricultural sector in SACU is about 20 percent, reflecting the prevalence of large-scale

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2 These data are based on the latest available unemployment series from the World Bank’s World Development Report (WDR) database and in a few selected cases from IMF country desks. In some cases, the data point may not be the most up to date, and the latest estimate of unemployment from the labor force and household surveys may be more representative of the actual unemployment rate. The authors used the three indicators for the level of unemployment precisely because of the weaknesses in unemployment data series in SSA, including in the SACU countries. The three series could be considered to be a lower bound, a possible mean, and an upper bound of unemployment rates in these economies. The high unemployment rate in SACU could reflect higher-quality unemployment data in SACU.

3 See http://laborsta.ilo.org/applv8/data/c2e.html.
Figure 6.2 Cross-Country Unemployment Rates
Note: Data for the Southern African Customs Union are for 2010; all other sub-Saharan African countries are 2008 estimates. Data for countries outside sub-Saharan Africa are 2009 estimates.

Selected countries outside Africa:
- Chile: 9.99%
- India: 3.26%
- Malaysia: 4.27%
- Jamaica: 17.38%
- Trinidad and Tobago: 13.51%

Greater than 20%
10% to 20%
Less than 10%
No data available

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commercial farming, whereas the rest of SSA is largely dominated by small-scale and subsistence farming (Figure 6.4). By way of comparison, the labor force surveys of Ethiopia and Ghana report that 80 percent and 50 percent of employed workers, respectively, are in the agricultural sector. This could suggest that SACU has higher-quality jobs than the rest of SSA, despite its higher unemployment rates, and also suggests that higher labor productivity can coexist with higher unemployment, in line with the efficiency wage theory. 4

- The share of people outside the labor force is a more reliable indicator of unemployment than the official unemployment rate. Thus, this analysis computed the out-of-employment rates as another indicator of unemployment levels. These rates are significantly higher than the official unemployment rates for all other countries covered in this chapter, in SSA including SACU. 5 Like the overall unemployment rate, SACU countries have the highest out-of-employment rates, reflecting a larger proportion of discouraged job seekers in the region or people who have not embarked upon a job search because they do not see promising prospects. In South Africa, about 15 percent of the labor force is made up of discouraged job seekers. In Botswana, the

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4 The idea of the efficiency wage theory is that it may benefit firms to pay workers a higher wage than their marginal revenue product because doing so might lead to increased productivity from the worker.

5 The out-of-employment rate is the percentage of people of working age without a job whether they are out of the labor force, discouraged unemployed individuals, or unemployed and actively looking for a job.
A comparison of the labor force composition in SACU with that of other regions shows that female labor force participation rates tend to be lower in SACU countries. This level probably reflects higher reservation wages for females in SACU countries than other regions in SSA. It could also reflect better employment conditions in SACU countries. High unemployment in SACU, together with low labor force participation rates for females, has resulted in very low ratios of employment to working-age population.

Overall, one key message from the data analysis is that governments in SACU, and more generally in SSA, need to invest more in improving the quality of unemployment data. Implementing policies to enhance job creation and monitoring the effectiveness of those policies require higher-quality statistics.

**EMPIRICAL ANALYSIS OF THE DATA**

This section reports on the results of our empirical analysis on the factors that could explain the persistently high unemployment rates in the SACU region.
Unemployment and Growth—Employment-Output Elasticity

Any meaningful discussion of unemployment needs to look at the role of economic growth in reducing unemployment. A commonly held view is that significant growth acceleration is required for unemployment to be reduced substantially. Table 6.1 provides estimates, using equation (6.1), of the employment-output elasticities for the 33 countries in our cross-country sample including the SACU region. The results show that the employment-output elasticity $\beta$ averaged about 0.4 and the constant term, $\alpha$, in the panel regression was consistently negative. The latter is significant because it signals the role of factors other than GDP growth in employment creation.  

$$\log(employment)_t = \alpha + \beta \log(real\ GDP)_t + \varepsilon_t$$  (6.1)

To what extent does the low cost of capital influence labor market outcomes in SACU? Specifically, have the roles of capital and labor in SACU been distorted over the years as large sections of the population were excluded from economic activity and production became more capital intensive because of the low cost of capital? Figure 6.5 shows that the lower the cost of capital (measured using the benchmark bank lending rate), the higher the unemployment rate. Overall, both the highly significant constant term ($\alpha$s) in the estimated panel regressions and the low effective cost of capital in SACU suggest that structural distortions in the SACU labor market may be contributing to persistently high unemployment, explaining why the labor market is not clearing. The next section reports the results of a series of estimations exploring the likely role of such structural distortions in SACU’s labor market through empirical techniques using both correlation and panel regression analyses.

Wage Policy and Labor Market Outcomes

The analysis shows that public sector real wage growth in excess of productivity is closely correlated with the unemployment rate in SACU (Figure 6.6). In fact, SACU’s real wages in excess of productivity gains are significantly higher than for other countries in the sample. The size of the public sector and higher public sector wages do influence labor market outcomes in an economy, including the

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6 The explanatory powers of the estimated panel regressions are reasonably high, with adjusted $R^2$ for the four regressions in Table 6.1 being 0.61, 0.58, 0.57, and 0.54, respectively.
7 The persistently high unemployment rate in some SACU countries, specifically Botswana and Namibia, also reflects the fact that although the mining sector generates growth it does not create much employment because of the sector’s capital intensity.
8 A growth accounting exercise for Botswana suggest that much of the real GDP growth since 2000 was based on capital deepening.
9 This chapter uses the consumer price index–based real wage measure instead of the GDP-deflator–based real wage, and productivity growth is proxied by an adjusted output per capita for the manufacturing and construction sectors.
private sector’s ability to create jobs. The bloated public sector in SACU, in which governments typically account for 40–60 percent of total national employment, lures job seekers with greater job security and higher wages, thus distorting labor market outcomes. Historically, government hiring practices in SACU have typically inflated wage expectations. These practices have also placed a premium on liberal arts and social sciences degrees over skills in demand in the private sector, thus influencing education choices and contributing to the skills mismatch in the labor market (see the discussion below on the role of skills mismatch in SACU’s labor market.) Other benefits of a public sector job include stability, reputation, and long-term security, among others. However, inferring causality from real wages to unemployment outcomes in SACU is difficult based on bivariate correlations. Thus, the panel regression analysis analyzes the causal relationships between unemployment and its macroeconomic determinants. The estimated panel regressions, which use various panel estimation techniques (Table 6A.1), show that high real wage growth above productivity in SACU tends to result in persistently high unemployment, including by encouraging informality in the SACU economies.

The high real wage growth, which outpaced labor productivity growth in SACU, partly reflects the outcomes of its centralized collective bargaining framework. This wage bargaining system not only contributes to the weak link between pay and productivity, but also reduces the response of the real wage to fluctuations in the business cycle. Additionally, the higher real wage puts upward pressure on labor costs and causes firms to substitute capital for labor, thereby increasing the marginal productivity of labor.

### Union Density and Unemployment

Over the years, unions have played a pivotal role in SACU. Their emphasis on workers’ rights is well placed and bodes well with enhancing more inclusive growth. SACU’s union density is also relatively high compared with other countries in our sample. This said, if the job market is mainly dominated by a highly unionized government sector, sometimes this tends to give rise to voluntary unemployment in the nonunionized sectors. The high degree of correlation between unionization and unemployment (Figure 6.6) suggests that high union density in SACU may be contributing to unemployment outcomes. The panel

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regression also supports this negative impact of union density on SACU’s overall unemployment rate.

**Skills Mismatch in the Labor Market and Unemployment**

The analysis shows that the skills mismatch in SACU is highly correlated with the region’s unemployment rate. The skills mismatch index is calculated by taking the difference between the skill demand and supply for each country in the sample.

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**Figure 6.5** Employment-Output Elasticity, Job Creation, and the Effective Cost of Capital

Sources: International Labor Organization database; and IMF staff calculations.

Note: Member countries of the Southern African Customs Union (SACU) have lower estimated employment-output elasticity and employment growth compared with other middle-income countries. SACU countries also have generally lower effective costs of capital, which seems to be associated with high unemployment rates across the region.
Figure 6.6 Unemployment Rates and Labor Market Indicators: Correlation Analysis, 2000–09
Sources: International Labor Organization database; World Bank, World Development Report database; and IMF staff calculations.

Note: CEMAC = Central African Economic and Monetary Community; SACU = Southern African Customs Union; WAEMU = West African Economic and Monetary Union. The unemployment rate seems to be positively correlated with the wage-productivity gap, union density, and skills mismatch in the labor market. However, the unemployment rate seems to have little association with the welfare benefits or with restrictiveness of labor laws. Moreover, SACU countries generally have low minimum wages compared with peer countries.
Following Estevao and Tsounta (2011), the skills mismatch index for each country $i$ at time $t$ is constructed using equation (6.2):

$$
\text{Skills Mismatch Index}_{it} = \sum_{j=1}^{3} (S_{ijt} - M_{ijt})^2,
$$

in which $j$ is the skill level; $S_{ijt}$ is the percentage of the population with skill level $j$ at time $t$ in country $i$ (skill level supply), and $M_{ijt}$ is the percentage of employees with skill level $j$ at time $t$ in country $i$ (skill level demand).
• **Skill level supply.** World Bank educational attainment data are used to construct skill level supply using primary education (as low-skilled), secondary education (as semiskilled), and college and tertiary education (as highly skilled).

• **Skill level demand.** Skill level demand is approximated by the percentage of employees in three key sectors: mining and construction (to proxy low-skilled workers), manufacturing (for semiskilled workers), and government and financial services (for highly skilled workers).  

The results support the basic conclusion from the analysis of labor force surveys for SACU countries, which shows that skills mismatch is an important issue in its labor markets (Figure 6.6). SACU countries generally have a high rate of schooling for primary and secondary education, reflecting their high spending levels on education compared with other regions in SSA. However, this high rate of schooling has not yet translated into greater private sector–type skills because it has produced graduates whose skills are not in demand in the private sector.  

Increases in tertiary education would eventually help to meet the demands of the private sector and, over time, reduce the skills mismatch in the labor market. The required type of tertiary education closely mimics specialized advanced education, which supplies firms with highly skilled workers to create more employment. The estimated panel regressions (Table 6A.1) suggest that the mismatch between the skills the labor force possesses and the skills firms seek explains part of the high unemployment in SACU. Although many governments in the region have spent generously educating their youth, firms regularly cite the lack of suitable skills among job applicants as a constraint to hiring. In Botswana, unemployment rates are highest among college graduates, although for South Africa it is highest among unskilled workers. The former suggests that the education systems have not been successful in producing graduates with marketable job skills. Improving the quality of education spending to support public-private partnerships for skills development, vocational and technical training, and information and communications technologies skills, including the recent graduates’ internship program in Botswana, will over time reduce the skills mismatch and thus the overall unemployment rate.

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11 Although the Estevao and Tsounta (2011) method of estimating skill supply is reasonably robust based on educational attainment, the measures of skill demand and skill intensity do have some weaknesses, including treating the mining sector as low-skilled in the skill-intensity spectrum when most of the mining sector employees in SACU are at least medium- to highly skilled.

12 The current structure of the education system in many countries in SSA is in part a legacy of the colonial period through which senior civil servants encouraged students in the 1960s to study liberal arts and social sciences so they could help them run the public sector. Public servants’ salaries and benefits were made very generous to attract the best. This was exacerbated during the post-independence era, giving rise to unsustainable public wage bills as they made public sector employment very attractive in order to get the needed skilled civil servants. The distorted public sector wages resulted in an education system that produced graduates for the civil service but who did not have modern skills that firms demand in the current labor market.
Welfare Benefits and Unemployment

The analysis suggests that welfare benefits are not closely correlated with unemployment in SACU (Figure 6.6). Although other regions in SSA have, on average, higher welfare spending than that in SACU countries, they have significantly lower unemployment rates. In fact, the data show that welfare benefits in SACU are not only, on average, lower than in other regions in SSA, they also are not associated with increased levels of voluntary unemployment through their impact on the reservation wage of workers—the minimum wage that workers usually demand to formally reenter the labor force. The panel regressions also support this broad finding. This is an important result with implications for public policy in SACU: if unemployment is not affected by welfare spending, then welfare programs can be used to help the unemployed and discouraged workers without fear of the policy leading to a higher unemployment rate. These findings are consistent with Kingdon and Knight (1999), which also rejects the voluntary unemployment hypothesis through the impact of the replacement ratio (benefit-wage ratio) on the unemployment rate.

Labor Market Regulations and Unemployment

Labor market regulations typically hamper job creation. Specifically, hiring and firing costs can negatively influence employers’ decisions to hire new employees. Figure 6.6 suggests a low degree of correlation between hiring and firing costs and unemployment rates in SACU. In fact, overall, SACU countries have lower hiring and firing costs despite having the highest unemployment rates in SSA. The countries in the non–natural-resource-rich group have relatively high hiring and firing costs, yet their unemployment rates are, on average, lower than SACU’s. Thus, despite relatively low hiring and firing costs, the unemployment rates for SACU remain high; in other countries in SSA, high hiring and firing costs coexist with low unemployment rates, although higher-quality unemployment data in SACU could be the cause of this disparity.

The estimated panel regressions (Table 6A.1) also show that hiring and firing costs in SACU are not a significant determinant of overall unemployment in SACU. The result suggests that the high unemployment rate in SACU is not closely associated with labor hiring and firing rules. In fact, minimum wages (as a share of average wages in the economy) in SACU are on the low side relative to some other countries, although the small sample size, caused by data limitations, precludes the drawing of a general conclusion (Figure 6.6). Beyond this, the

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13 Most countries in the sample did not have continuous time series data on unemployment benefits; therefore, the analysis used welfare benefits data series that come directly from the fiscal accounts under spending.

14 Hiring and firing costs are based on World Bank data.
estimated panel regressions suggest that the high unemployment rate has little to do with the restrictiveness of the labor laws.\textsuperscript{15}

**The Role of Demographic Factors**

The analysis does not demonstrate that demographic pressures have affected unemployment in SACU. Figure 6.7 shows that the rate of population growth is trending downward (below 1 percent) across SACU countries (this compares with an estimated 2½ percent annual population growth for the whole of SSA). Although the size of the working population as a ratio of total population is projected to increase as the impact of HIV/AIDS dissipates in the region, these ratios would generally remain low by standards in other regions in SSA. Moreover, the demographic variable is not significant in the estimated panel regressions.

**Summary of Results**

Pulling the threads together, the balance of evidence suggests that SACU’s high unemployment rate is largely driven by public sector wage policies, which distort labor market outcomes, including through their impact on education choices that cause skills mismatches. As noted, government hiring practices have typically inflated wage expectations and placed a premium on graduates with liberal arts or social science degrees over actual skills in demand in the private sector. Thus, the wage structure of the civil service in SACU is distorting the overall labor market and creating voluntary unemployment as graduates line up to get public sector jobs commensurate with their high reservation wages. This situation has also exacerbated the misalignment between labor productivity and real wages established in this chapter, thus discouraging employment creation. All of these factors have important policy implications because it is the confluence of government hiring practices and the public sector wage policy, reinforced by a less flexible wage bargaining process, that gives rise to distortions in the labor market, suggesting the need for a fundamental change in SACU. SACU countries should change their public sector wage policies not only to enhance fiscal sustainability, but also to reduce the associated distortions in their labor markets.

The prevailing wage rates in SACU cause excess demand for skilled labor and, for some countries, an excess supply of unskilled labor. Targeted interventions in key sectors, combined with a comprehensive reform of the education system, are needed to create conditions for rapid economic growth with job creation. Private sector–led approaches to improving technical and vocational training, in which governments standardize the curriculum and accrediting program, are the most promising route for education system reform. Korea’s experience in reducing the

\textsuperscript{15}Neither the welfare benefits variable nor the HIV/AIDS dummy was significant in the estimated panel regressions. Although HIV/AIDS did put a dent in labor force growth in the early 1990s, efforts by governments to address the pandemic attracted donor support, including from the William J. Clinton Foundation and the Bill and Melinda Gates Foundation, and seem to have made significant progress on the rate of new infections, especially among pregnant women.
heavy emphasis on university education and promotion of tertiary education and vocational training is relevant in this regard. Similarly, the Japanese experience of improving labor market outcomes of training through close links with industry, continuous curriculum development, and the introduction of new programs focused on skills requirements of the job market, can help meet the demand for skilled labor in both the tradable and nontradable sectors (Treichel, 2010). It is encouraging to note that governments in the SACU region have already begun to take some of these initiatives to address the skill mismatch.
The average effective tax rate is calculated following Mendoza, Razin, and Tesar (1994), which is a method of producing effective tax rates using data on actual tax payments and national accounts. The main advantage of this method is that it is less stringent on data requirements than other methods and easily applicable to cross-country work.

The significance of the effective cost of capital variable in the estimated unemployment panel regressions supports the view that policies in SACU could be biased toward capital-intensive sectors at the expense of labor-intensive sectors. In particular, SACU’s wide-ranging tax incentives have resulted in a low effective tax rate on capital compared with labor (Figure 6.8).16 Since economic liberalization policies began in the early 1980s, countries in SACU have put in place a series of tax incentives aimed at supporting capital-intensive sectors. Over the years, tax incentives have proliferated and led to what is now a very complex incentive regime. The analysis presented here shows that the plethora of tax incentives in SACU has produced low effective tax rates on capital, which favors capital-intensive activities. Streamlining tax incentives for capital will raise the effective cost of capital and reduce the associated distortions on job creation.

In addition to the above empirical analysis, the authors explored Botswana and Chile—two natural-resource-rich economies—both of which are deemed to be success stories for prudent economic management but have had different unemployment outcomes. Both economies are characterized by relatively low inflation, fiscal discipline, institutional strength, good infrastructure, and high standards of governance. Despite these similarities in fundamentals, Botswana continues to

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16 The average effective tax rate is calculated following Mendoza, Razin, and Tesar (1994), which is a method of producing effective tax rates using data on actual tax payments and national accounts. The main advantage of this method is that it is less stringent on data requirements than other methods and easily applicable to cross-country work.
have a double-digit unemployment rate, well above the world average, whereas Chile has generally kept its unemployment rate below 10 percent (Figure 6.8). What explains this divergence in unemployment outcomes between the two economies?

- Unlike Botswana, Chile has made much progress in diversifying its economy away from mineral resources, thereby making the economy more resilient to shocks and limiting the Balassa-Samuelson effect from the tradable to the nontradable sector through wages. In particular, over the years, Chile’s service sector has expanded in both value added and in share of total employment.
- Through sound fiscal policy, Chile has also reduced the size of the government (Figure 6.9) and has maintained a composition of government spending that favors economic growth and job creation.
- Chile has also delivered better education outcomes, that is, the quality of its skilled employees is higher compared with Botswana or SACU more generally.

Unemployment and Income Inequality in the SACU Region

High structural unemployment in many countries has hindered the ability of governments to achieve more-inclusive growth. The literature shows that countries with better Gini coefficients (greater income equality) tend to be those with more diversified economies and lower rates of unemployment, which provide a robust foundation for more sustainable growth in the long term (Mocan, 1995). Those countries are generally able to improve the living standards of their populations for longer periods, even if their output growth is not as impressive as that in many natural-resource-rich economies. This leads to the question of the relationship between the unemployment rate and income inequality in SACU.

To address this question, the analysis takes a panel that includes three SACU countries and other selected middle-income countries, decomposes unemployment into its structural and cyclical components, and investigates their impact on income distribution, controlling for the effect of inflation. If marginal workers with relatively low skills are laid off first during an economic downturn, and if these workers are at the bottom part of the income distribution, temporary increases in unemployment are expected to worsen income inequality. However, the loss of income owing to transitory unemployment of a family member may be offset by unemployment insurance and welfare benefits, especially given the growing incidence of dual earners in families. Thus, it may take longer spells of unemployment to have a marked impact on annual family incomes.

Following Mocan (1995) to investigate whether long-term and short-term unemployment have differential impacts on income inequality in SACU, actual unemployment is decomposed into its trend and cyclical components. Because the hypothesis of a unit root is rejected for unemployment across SACU countries, the conventional way to determine structural (long-term) unemployment is to regress the unemployment rate on a constant, and linear and quadratic trend
The fitted values represent the long-term (structural) unemployment, whereas the trend deviations illustrate cyclical unemployment. As a robustness check, structural unemployment is obtained in two ways. First, the Hodrick-Prescott (HP) filter is applied to obtain the structural component of unemployment. Second, the Kalman filter technique is applied, which allows an estimate to be made of the trend at all points in the sample using all the observations.
Structural unemployment obtained from the HP filter and from fitting linear and quadratic trends are broadly similar. The benchmark is taken to be the structural unemployment data series obtained from the fitted values of linear and quadratic trends. However, as Table 6A.2 illustrates, the results obtained from models with other measures of structural unemployment are similar to the ones obtained from the model with standard decomposition.

Table 6A.2 shows the estimation results of the models in which changes in income shares are regressed on inflation, and on structural and cyclical unemployment. The first panel presents the results when structural unemployment is obtained by fitting linear and quadratic trend terms to actual unemployment. The second panel is the model in which structural unemployment is obtained through the HP filter, and the third panel is the case in which structural unemployment is obtained through the Kalman filter. In all specifications, an increase in structural unemployment is associated with an increase in the fourth-highest and highest income quintiles with a negative impact on the first three income quintiles, but a change in cyclical unemployment has no impact on the income share of this group. Thus, the results provide some evidence that an increase in structural unemployment is associated with an increase in the income share of the richest 40 percent of the population, and with a decrease in the share of the bottom 60 percent of the population.

These results suggest that, although policies that aim to prevent a worsening in income inequality by combating cyclical downturns have validity, sustained GDP growth in SACU cannot by itself improve income inequality if it is not associated with a reduction in long-term structural unemployment. The results show that reductions in structural unemployment substantially improve income distribution. To the extent that better education outcomes in SACU contribute to a reduction in structural unemployment (as partly inferred from the estimated unemployment–skills mismatch function), they reduce income inequality, thus having the potential to make growth more inclusive. The policy implication is that for SACU countries and countries with similar structural unemployment–income equality dynamics, policies that lead to more sustained reduction in structural unemployment would enhance more inclusive growth. Policies may include incentives to employers to hire less-skilled workers in addition to training programs for workers who face stagnant wages and longer spells of unemployment or hysteresis effects.

---

17 The sample consists of three SACU members (Botswana, Namibia, and South Africa) and eight other middle-income countries from three regions: Eastern Europe, Latin America, and Asia. The sample period is 1990–2009, and Arellano and Bond’s generalized method of moments panel regression estimation technique was used. Data for Lesotho and Swaziland were not available.

18 These results are broadly consistent with the results of the growth incidence curves in the October 2011 Regional Economic Outlook for sub-Saharan Africa (IMF, 2011b), which found changes in the coefficients on the level of education are broadly consistent with changes in per capita consumption of the poorest quartile of the distribution for a selected group of economies in sub-Saharan Africa.
CONCLUSIONS AND POLICY LESSONS

Job creation is a key challenge for policymakers in the SACU region. This chapter analyzes the factors that have contributed to SACU’s high unemployment rate. Although there is some diversity in labor market conditions among the SACU countries, the broad conclusion from the empirical analysis and case studies suggests that no single measure can address the unemployment problem. Only a combination of carefully designed initiatives and faster growth are likely to make significant inroads into unemployment.

Closing the huge jobs gap in SACU would require faster economic growth and fundamental changes in public sector wage policy, not only to enhance fiscal sustainability but also to reduce the associated distortions in the labor markets. The analysis suggests that significant growth acceleration is required to put a substantial dent in the SACU unemployment rate. The confluence of government hiring practices and the public sector wage policy, reinforced by less flexible wage bargaining processes, has also given rise to distortions in the labor market.

Education policies in SACU urgently need to be aligned with the skills needs of the private sector. The quality of education spending could be improved to support public-private partnerships for skills development, focus on vocational and technical training, and build skills in information and communications technologies. It is encouraging to note that governments in the SACU region have already begun to take some of these initiatives to address the skill mismatch in their labor market.

Based on this study, other policy changes that would generate faster job creation include the following:

- Economic diversification would create labor-intensive sectors and enhance the economy’s potential to create more jobs, including through limiting the traditional Balassa-Samuelson effects on the nontradable sectors. Thus, policies also need to focus on measures to improve the investment climate and reduce the costs of doing business in SACU to boost such new job-creating sectors, especially in the context of the ongoing structural economic transformation in the region.

- Targeted government intervention in key nontradable sectors with high employment multipliers will also help. The segmentation of SACU’s labor markets argues for well-targeted intervention in certain sectors.

Finally, the governments in SACU urgently need to invest in strengthening statistics for their labor markets and unemployment. This chapter has established that there are significant variations between unemployment indicators in SACU from various sources and estimated out-of-unemployment rates, highlighting severe weaknesses in unemployment data. Monitoring the effectiveness of job-creation policies in SACU, and in sub-Saharan Africa more generally, would require higher-quality unemployment statistics.
APPENDIX 6A.

The baseline sample consists of 33 countries, but most do not have continuous time series data on the key variables used to estimate the panel. Thus, the final panel has only 11 countries that have continuous time series data on the key variables in the estimated regression countries, including the five SACU members. The sample period is 1990–2009. As noted in Table 6A.2, panel regression techniques were employed: pooled-regression, fixed effects estimator, and Arellano and Bond’s generalized method of moments regression estimation technique. The latter method implicitly addresses endogeneity issues inherent in the estimated unemployment equation. As expected, the wage-productivity gap variable has the correct estimated positive coefficient, with a rising wage-productivity gap leading to an increase in the unemployment rate after a one-year lag. Union density also raises the unemployment rate after a one-year lag and increase in skills mismatch. In contrast, a lowering of the effective cost of capital raises the overall unemployment rate with a three-year lag. As noted in the main text, the labor law variable has the correct estimated coefficient but is insignificant in all the estimated panel regressions.

<table>
<thead>
<tr>
<th>TABLE 6A.1 Estimated Panel Regressions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explanatory variables</td>
</tr>
<tr>
<td>ΔUnemployment(–2)</td>
</tr>
<tr>
<td>Constant</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>ΔWages in excess of productivity(–1)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>ΔUnion density(–1)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>ΔLabor laws restrictiveness(–2)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>ΔSkills mismatch index(–1)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>ΔDemographic(–2)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>ΔEffective cost of capital(–3)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Error-correction mechanism(–1)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Adjusted $R^2$</td>
</tr>
<tr>
<td>Number of observations</td>
</tr>
</tbody>
</table>

Source: Authors’ calculations.
Note: Entries in parentheses are the calculated t-statistics.
* significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.
### TABLE 6A.2
Structural Unemployment and Income Inequality for Selected Middle-Income Countries

**Estimation Method: Dynamic Panel Data Modeling using the Arellano-Bond Estimator**

#### Structural Unemployment from Fitted Trend

<table>
<thead>
<tr>
<th>Explanatory variables</th>
<th>Lowest quintile</th>
<th>Second quintile</th>
<th>Middle quintile</th>
<th>Fourth quintile</th>
<th>Highest quintile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>−0.201</td>
<td>0.295*</td>
<td>0.393**</td>
<td>0.285</td>
<td>−1.165</td>
</tr>
<tr>
<td>(−1.609)</td>
<td>(−1.914)</td>
<td>−2.277</td>
<td>−1.54</td>
<td>(−1.914)</td>
<td></td>
</tr>
<tr>
<td><strong>Structural unemployment</strong></td>
<td><strong>−0.038</strong></td>
<td><strong>−0.058</strong></td>
<td><strong>−0.073</strong></td>
<td><strong>0.049</strong></td>
<td><strong>0.216</strong></td>
</tr>
<tr>
<td>(−2.194)</td>
<td>(−2.002)</td>
<td>(−2.180)</td>
<td>(2.476)</td>
<td>(2.216)</td>
<td></td>
</tr>
<tr>
<td>Cyclical unemployment</td>
<td>−0.026</td>
<td>0.041**</td>
<td>−0.014</td>
<td>0.002</td>
<td>0.068</td>
</tr>
<tr>
<td>(−1.516)</td>
<td>(−2.039)</td>
<td>(−0.545)</td>
<td>(0.09)</td>
<td>(−1.043)</td>
<td></td>
</tr>
<tr>
<td>Inflation</td>
<td>0.051**</td>
<td>0.031**</td>
<td>0.030*</td>
<td>−0.007</td>
<td>−0.107**</td>
</tr>
<tr>
<td>4.301</td>
<td>−2.234</td>
<td>−1.931</td>
<td>(−0.422)</td>
<td>(−2.372)</td>
<td></td>
</tr>
<tr>
<td><strong>R</strong></td>
<td>0.55</td>
<td>0.48</td>
<td>0.60</td>
<td>0.41</td>
<td>0.58</td>
</tr>
<tr>
<td>Durbin-Watson statistic</td>
<td>2.34</td>
<td>2.26</td>
<td>2.47</td>
<td>2.25</td>
<td>2.55</td>
</tr>
</tbody>
</table>

#### Structural Unemployment from Hodrick-Prescott Filter

<table>
<thead>
<tr>
<th>Explanatory variables</th>
<th>Lowest quintile</th>
<th>Second quintile</th>
<th>Middle quintile</th>
<th>Fourth quintile</th>
<th>Highest quintile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>0.218*</td>
<td>0.240</td>
<td>0.320*</td>
<td>0.227</td>
<td>−0.987</td>
</tr>
<tr>
<td>(1.730)</td>
<td>(1.605)</td>
<td>(1.877)</td>
<td>(1.254)</td>
<td>(−2.030)</td>
<td></td>
</tr>
<tr>
<td><strong>Structural unemployment</strong></td>
<td><strong>−0.040</strong></td>
<td><strong>−0.049</strong></td>
<td><strong>−0.061</strong></td>
<td><strong>0.039</strong></td>
<td><strong>0.186</strong></td>
</tr>
<tr>
<td>(−1.992)</td>
<td>(−2.785)</td>
<td>(−1.991)</td>
<td>(−2.226)</td>
<td>(2.042)</td>
<td></td>
</tr>
<tr>
<td>Cyclical unemployment</td>
<td>−0.024</td>
<td>0.047**</td>
<td>−0.017</td>
<td>−0.0004</td>
<td>0.077</td>
</tr>
<tr>
<td>(−1.288)</td>
<td>(−2.138)</td>
<td>(−0.692)</td>
<td>(−0.0009)</td>
<td>(−1.077)</td>
<td></td>
</tr>
<tr>
<td>Inflation</td>
<td>0.051**</td>
<td>0.029**</td>
<td>0.028*</td>
<td>−0.009</td>
<td>−0.102**</td>
</tr>
<tr>
<td>4.337</td>
<td>−2.089</td>
<td>−1.759</td>
<td>(−0.522)</td>
<td>(−2.226)</td>
<td></td>
</tr>
<tr>
<td><strong>R</strong></td>
<td>0.43</td>
<td>0.35</td>
<td>0.37</td>
<td>0.41</td>
<td>0.37</td>
</tr>
<tr>
<td>Durbin-Watson statistic</td>
<td>2.35</td>
<td>2.22</td>
<td>2.4</td>
<td>2.25</td>
<td>2.49</td>
</tr>
</tbody>
</table>

#### Structural Unemployment from Kalman Filter

<table>
<thead>
<tr>
<th>Explanatory variables</th>
<th>Lowest quintile</th>
<th>Second quintile</th>
<th>Middle quintile</th>
<th>Fourth quintile</th>
<th>Highest quintile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>0.156</td>
<td>0.170</td>
<td>0.193</td>
<td>0.126</td>
<td>−0.607</td>
</tr>
<tr>
<td>(1.660)</td>
<td>(1.545)</td>
<td>(1.507)</td>
<td>(0.925)</td>
<td>(−1.654)</td>
<td></td>
</tr>
<tr>
<td><strong>Structural unemployment</strong></td>
<td><strong>−0.029</strong></td>
<td><strong>−0.037</strong></td>
<td><strong>−0.039</strong></td>
<td><strong>0.022</strong></td>
<td><strong>0.120</strong></td>
</tr>
<tr>
<td>(−2.680)</td>
<td>(−2.603)</td>
<td>(−2.703)</td>
<td>(−2.226)</td>
<td>(2.765)</td>
<td></td>
</tr>
<tr>
<td>Cyclical unemployment</td>
<td>−0.036</td>
<td>0.082</td>
<td>−0.027</td>
<td>−0.003</td>
<td>0.135</td>
</tr>
<tr>
<td>(−1.214)</td>
<td>(−2.367)</td>
<td>(−0.667)</td>
<td>(−0.070)</td>
<td>(−1.174)</td>
<td></td>
</tr>
<tr>
<td>Inflation</td>
<td>0.049**</td>
<td>0.024*</td>
<td>0.024*</td>
<td>−0.011</td>
<td>−0.102**</td>
</tr>
<tr>
<td>(4.012)</td>
<td>−1.669</td>
<td>−1.469</td>
<td>(−0.647)</td>
<td>(−1.838)</td>
<td></td>
</tr>
<tr>
<td><strong>R</strong></td>
<td>0.45</td>
<td>0.34</td>
<td>0.18</td>
<td>0.46</td>
<td>0.39</td>
</tr>
<tr>
<td>Durbin-Watson statistic</td>
<td>2.31</td>
<td>2.2</td>
<td>2.33</td>
<td>2.17</td>
<td>2.40</td>
</tr>
</tbody>
</table>

Source: IMF staff calculations.
Note: Entries in parentheses are the calculated t-statistics.
* significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.


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