



The way forward on African Economic Integration Initiatives: Evidence from Southern African Development Community

By:

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Abstract

This study reviews the doubts and challenges on economic integration initiatives in Africa and empirically investigates the move towards economic integration in the context of Southern African Development Community (SADC). Methodological approaches like measures of co-movement in real GDP, linear and nonlinear econometric techniques to test relative price convergence in the region are carried to answer the research questions in the paper. Furthermore, the paper uses simple descriptive analysis to highlight the facts, challenges and achievements of SADC monetary integration initiative.

The study finds that nine SADC countries can potentially constitute SADC-OCA namely; Botswana, Madagascar, Malawi, Mozambique, Seychelles, South Africa, Swaziland, Tanzania and Zambia. Angola and Mauritius are disqualified from a SADC-OCA -at least for the sample period. The rest of the member states are not included due to data limitations. Furthermore, these findings encourage member countries to improve policy coordination and harmonize their policy initiatives to realise the proposed monetary union in SADC region. The study further emphasizes that awareness creation, economic education, and information campaigns are paramount to form rational expectations in the region and to avoid premature collapse of the economic integration initiative in the region. The findings from this study have important policy implications for the success of the economic integration initiatives in the region and beyond.

Keywords: Africa, SADC, Economic Integration, South-South Integration

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1. Introduction

In Africa, monetary integration has been in place since 1910 (Burgess, 2009). Monetary integration attempts should be evaluated in the context of their objectives, and their political, economic, and institutional setups on which they operate (Geda & Kibret, 2008). Regional economic integration, which can take the form of regional monetary union, can have positive welfare effects for the countries joining the union and leads to economic growth and poverty reduction (UNECA, 2010). Explicit political agendas were targeted towards African Economic Union since the Abuja Treaty in 1991. In the African context, monetary union or economic integration go beyond purely economic aspects. Political commitment to regional monetary policy coordination is generally assumed to be the precondition and underlying driving force of any integration process. With the advent of the African Union (AU), there have been intense renewed efforts by member states to give priority to policy coordination and economic integration, as a way to enhance their bargaining power via a common negotiating position in the era of globalization.

The economic integration in southern African countries is one of the oldest economic integration initiatives in the world and can be traced back to the Southern African Customs Union (SACU) which was created in 1910 between South Africa and its neighbours. SADC is the largest regional economic grouping in sub Saharan Africa (SSA) (Burgess, 2009). The objective of the regional integration agenda in SADC is to create a fully integrated internationally competitive region to ensure economic growth and poverty reduction. The SADC¹ region faces a number of challenges to achieving this goal but opportunities are all plentiful and the region is well positioned to take advantage of them (AfDB, 2011).

The main reasons for the economies of most African countries to remain detached from each other are overlapping membership of various Regional Economic Communities (RECs) and a lack of investment in the institutions and systems required for integration (UNECA, 2010; Jovanovic, 2006). In spite of these problems, SADC is moving towards the creation of a monetary union by 2018 (Belle, 2010).

¹ The fifteen countries forming SADC are Angola, Botswana, Democratic Republic of Congo, Lesotho, Malawi, Madagascar, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe. Zerihun et al. (2015). "The way forward on African Economic Integration Initiatives: Evidence from Southern African Development Community". Paper submitted for the Biennial Conference of the Economic Society of South Africa, University of Cape Town, Cape Town, South Africa, 2-4 September 2015.

There are mounting doubts about the economic and political feasibility of the monetary integration of SADC. The existing literature on the region only focuses on the Common Monetary Area (CMA), also known as the Rand Monetary Area. The literature on other monetary integration initiatives is largely biased towards north-north monetary integration (NNI), particularly the European Monetary Union (EMU). Furthermore, the original theory of optimum currency areas (OCA) did not take into account the attempts toward monetary integration among developing and emerging market economies, collectively known as south-south monetary cooperation or integration schemes (SSI), which sprung up since the 1990s (Fritz, et al, 2010).

Given such theoretical gaps and the absence of research frameworks which go beyond the OCA theory, there are already mounting doubts about the economic and political feasibility of monetary integration in the region. This study sheds light on the economic feasibility of the proposed monetary union in the SADC region, with some policy implications. *Therefore, we pose* the questions: should Africa refrain from any integration efforts? Why so much pessimism about monetary integration Africa? In this article we challenge these views by highlighting empirical findings from the Southern African development community (SADC) initiative.

Here we want to emphasise that the *awareness creation, economic education, and information campaign* in the process of any existing or proposed monetary union is important to develop the rationality of expectations and to avoid premature collapses. In the context of SADC and Africa in general, member states of economic communities need to work extensively in promoting consciousness of their fellow citizens in order to realise ongoing endeavours towards Pan-African Economic Community (PAEC). The remainder of the paper is structured as follows. The second section presents the literature review focusing on south-south economic integration. The third section highlights the experiences of SADC economic integration pinpointing achievements and challenges so far. The fourth section presents results and discussions, followed by conclusion and the way forward in the last section.

2. Literature Review

2.1 South-South Economic Integration and its Challenges

Both traditional monetary integration theory and its critiques are mainly designed for developed countries, referring predominantly to the euro area. Therefore, literature on OCA approaches in the analysis of south-south integration (SSI) initiatives, such as SADC, is scarce. The main background reference here is the article by Fritz and Mühlich (2010).

We need to consider the *original sin hypothesis* when we discuss SSI. Original sin hypothesis put simply is *'the inability of a country to borrow abroad in its own currency and measured as the ratio of foreign currency-denominated gross debt to foreigners as a share of total gross debt to foreigners'* (Eichengreen & Hausmann, 2005). This is the dominant case among developing countries. Hence, as stated by Fritz and Mühlich (2010), *the development of regional financial markets, that play a crucial role in minimizing exposure to currency and maturity mismatches, is critical.*

The original sin concept (Eichengreen, et al., 2005, Fritz & Metzger, 2006) evidences the particular importance of the denomination and composition of domestic and external debt for economic growth and development. Monetary integration is characterised by either the creation of a single currency or the adoption of a regional currency. The literature on original sin shows that a full monetary integration may reduce currency and maturity mismatches in regional balance sheets due to scale effects in portfolio diversification of an enlarged regional currency area (Eichengreen & Hausmann 2005; Panizza 2006). Thus, by definition, SSI is pursued by countries which accumulate debt in foreign currency, thereby most often suffering from a restricted lender of last resort function, balance sheet effects in the event of a currency devaluation and original sin and, as a result, small and undiversified financial markets. While levels and composition of internal and external debt may vary among the participating countries, SSI needs to deal with the specific monetary constraints of the member countries.

Intraregional hierarchies in terms of original sin and net creditor/net debtor relations play a crucial role for the success of an SSI project (Fritz and Mühlich, 2010). The authors further argue for a clear hierarchy in terms of indebtedness in foreign currency seems to provide favourable conditions for a successful SSI and may provide further perspectives for regional monetary integration and financial market development. In this sense, both stronger and weaker countries could benefit from regional monetary integration, with the larger economies establishing potentially stabilising leading roles. Fritz and Mühlich (2010) conclude that *‘intra-regional hierarchies, involving differing levels of original sin and indebtedness in foreign currency, constitute a major success factor for intra-regional exchange rate stabilisation and enhanced regional monetary SSI’*.

A regional monetary arrangement potentially generates economies of scale in regional financial markets. Thus, the potential stabilization gains of SSI need to be understood as a monetary strategy, including a specific exchange rate regime choice of the integrating countries. Emerging market economies are excluded from economic blocs based around the international key currencies. Given the international trend toward building economic blocs, it seems fruitful to understand the exchange rate regime options for developing and emerging market economies, from the perspective of their relation to the latter – *instead of the usually applied corner solutions perspective* (Priewe, 2006).

2.2 Experiences of Economic Integration in Africa

We begin this section with a brief historical background of economic integration initiatives in Africa in the post independence period. Since the early years of independence, regional integration and the creation of a pan-African common market has been a central vision of African leaders. Serious renewed efforts by member states to give priority to policy coordination and economic integration began with the advent of the African Union. On June 3, 1991, the African Economic Community was created and a call for an African Central Bank to follow by 2028 was made. The current plan is to establish an African Economic Community with a single currency by 2023. The question is does this plan be successful?

Economic integration initiatives in Africa are often led by public sector organizations without public support and the support of private sector, thus, failing to produce positive consequences (Jurčić, 2010). In the current situation of xenophobic society, the ‘Africa Unite’² slogan will not move Africa as it did during early years of independence. Empowering citizens and broader stakeholders to make informed decisions may also reduce the existing pessimism about PAEC. Deeper regional integration is thought of as a way to promote peace, security and stability by forcing a stronger commitment by members to unity within the AU. More recently, the AU has been emphasizing the economic benefits of deeper integration. Indeed, a common view is that Africa is becoming increasingly marginalized by globalization (Adepoju, 2001) and that governments see deeper integration as a way to enhance their bargaining power by achieving a common negotiating position.

However, many African countries belong to multiple customs unions, development associations or other multi-country institutions with various objectives and envision various degrees of integration. Three generalised approaches occurred in the post-independence period: Francophone countries which generally remained linked to the French Franc, former colonies of other European countries and Southern African economies which were generally drawn towards South Africa (Masson, 2008; Masson and Patillo, 2005). These differing approaches remain evident today, with the CFA Franc Zone (now linked to the Euro) and the CMA Rand Area, the only two single currency areas in Africa, with the other countries (generally colonies of Britain, Portugal, Spain and Belgium) using their own national currency. Together with these historical groupings, there has been renewed interest in regional cooperation, resulting in multiple regional economic communities (RECs) that are generally based upon geographical as well as historical circumstances.

Africa is known for its ‘*spaghetti bowl*’ of different national and sub-regional RECs (Geda & Kibret, 2008). The eight RECs recognized by the African Union (AU), which form the ‘pillars’ of the Pan-African Economic Community (PAEC), are moving towards implementing the Abuja Treaty at different speeds. While a single currency and a common

²The most influential song by Bob Marley
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central bank in Africa may remain aspirations for quite some time, strengthened policy coordination and macroeconomic convergence are entirely within the realm of feasibility in most sub regions of Africa (UNECA, 2010). Furthermore, regional integration offers significant “win-win” possibilities for the region’s economies, particularly for landlocked economies. Integration offers possibilities to leverage and extend economic comparative advantage at a regional level in ways not accessible through national development programs (UNECA, 2010).

Regional integration also can be a tool for African countries to facilitate and manage their globalization. Advantages in managing regional “commons” and in creating new regional public goods are similarly accessible through strengthened regional integration (Mistry, 2000). However, the process toward integration is inherently complex and fraught with pitfalls that can easily stall or block progress. As noted above, not all countries stand to gain equally from integration or commensurately with the costs they incur. Some countries or sub-regions are more advanced and politically prepared than others. Furthermore, large economies inherently are more self-reliant than small economies. These are just two examples, among webs of realities in the geography and political economy of Africa, of countries that must navigate in moving forward to integrate regionally.

3. Experiences of SADC Economic Integration: Achievements and Challenges

3.1 Achievements

SADC countries have a common vision of moving towards a common future. However, such a move requires a coordinated and transparent effort from member states and the citizens of the region. Macroeconomic stability is important in promoting regional economic integration and is essential in developing robust regional financial and capital markets. Maintaining stability will require strengthened policy coordination and macroeconomic convergence, which over time and with varying speed, depending on the sub region, can become building blocks toward deep integration and monetary unification.

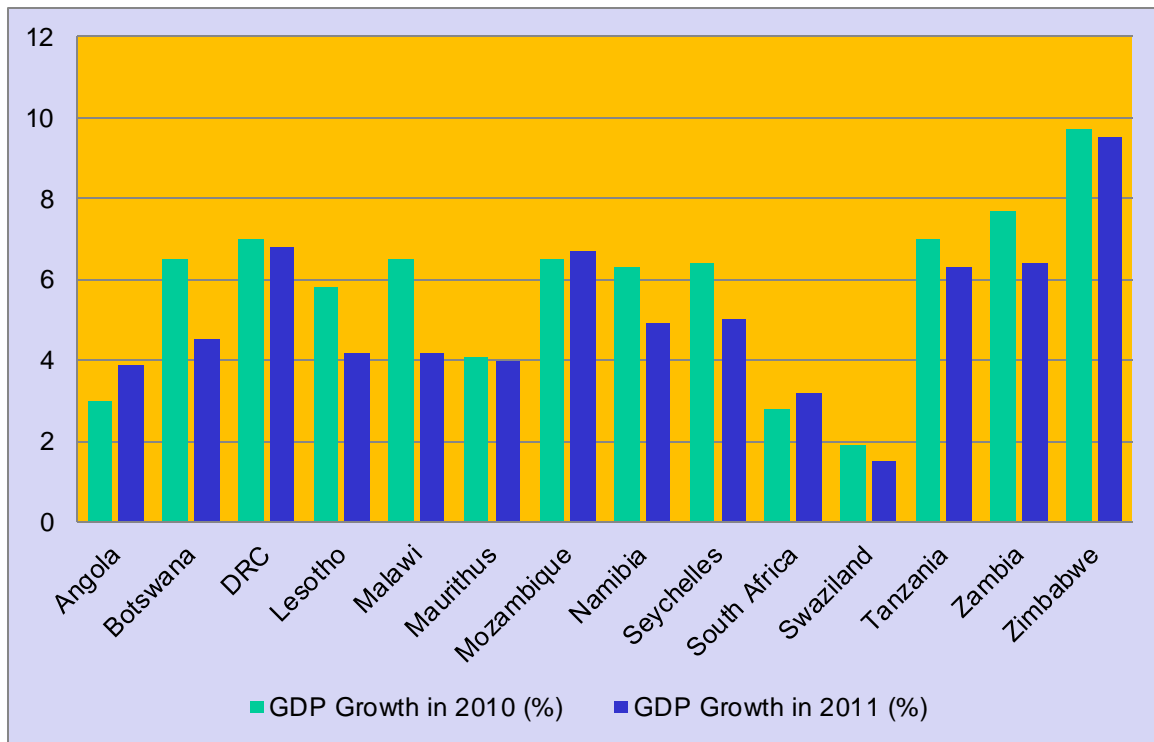
Table 3.1 presents the summary facts and figures of the SADC region. Most SADC countries have registered positive growth rates in 2011 and fixed investment growth (Figure 3.1). Angola's growth (3.9%) in 2011 was spurred by oil sector growth, trade-related activities, and the agriculture and construction sectors. South Africa experienced a 3.1% growth sustained by tertiary sector growth developments. Swaziland exhibited a much less favourable GDP growth rate (1.2%) with a small reduction from 2010 scores. This was mainly due to poor tertiary sector performance, related to increased fiscal short-term financial needs in 2010 and 2011.

Table 3.1: Summary facts and figures of SADC region

Indicator	Information	Indicator	Data	
Member states	15	Trade	Total Import	\$91,608.15 (million)
			Total Export	\$89,151.33 (million)
Year Established	1992	Average Government Debt (2011; % of GDP)	40.4%	
Land Area	554 919 km ²	Average Life Expectancy (2009)	55.1	
Total Population	277 million	Average HIV Prevalence Rate (2009)	12.6 %	
GDP Annual Growth Rate (2011)	5.14 %	Gender (proportion of seats held by women in parliament)-2011	34%	
GDP (2010)	\$575.5 Billion	GDP Contribution: Services	51 %	
Inflation (2011)	7.7 %	GDP Contribution: Industry	32 %	
Fiscal Balance (2012)	-3.6 %	GDP Contribution: Agriculture	17 %	

Source: SADC Secretariat (2012)

Figure 3.1: SADC Real GDP Growth Rate (%) in 2010 & 2011



Source: author computed WDI database

SADC economies are heavily dependent on trade, especially in agricultural products, for their exports and for their imports, machinery, fuels, chemicals, and other inputs related to production. Recently, trade with the outside world has outweighed intra-SADC trade primarily because the economic structure of the SADC states has changed only marginally (Intra-SADC Trade Performance Review, 2007). Indeed, all SADC states belong to more than one regional integration grouping with binding commitments on trade matters; for example, commitments to both COMESA and SADC.

Member countries of SADC have been engaged in a series of trade liberalisation activities such as negotiating and signing bilateral trade agreements and even negotiating at the multilateral level under the World Trade Organization (WTO) in order to increase intra-SADC trade and enhance regional integration. Moreover, political and economic motives have shaped the regional integration process. Commitments have been undertaken over time, geared towards creating conditions for enhanced free trade through the reduction of and complete removal of tariffs on products traded within the region.

A number of bilateral trade agreements negotiated between SADC member states exist within the region, even though some SADC member states haven't signed bilateral trade agreements within SADC. Engaging in bilateral trade agreements could be seen as fast-tracking benefits of trade liberalisation between contracting parties, rather than waiting for all regional members to open up their territories to free trade. In this regard some achievements in SADC are highlighted in Box1.

Box 1: Some Achievements in SADC

- Creating initiatives to coordinate customs procedures and instruments (including electronically exchanging customs data);
- Developing a single customs administrative document (SADC CD) to harmonize customs declarations in the SADC;
- Passing a law on a SADC customs model to facilitate the coordination of customs in national legislations;
- Adopting a nomenclature of common tariffs;
- Proposing and developing a regional transit framework;
- Initiating a review of rules of origin in 2007;
- Creating a software on trade facilitation: for example, the promotion of a single counter at border posts and to implement SADC Transit Chain Bond Guarantee regulations;
- Updating non-tariff obstacles to inform, monitor and eliminate non-tariff obstacles in 2007;
- Harmonizing trade liberalization through a tripartite task force comprising SADC, COMESA and EAC;
- Drafting protocols on trade and the free movement of people, goods, capital and services; and
- Developing a regional qualifications framework for coordinating education systems in the region to facilitate the free movement of people and manpower.

Source: UNECA, 2010, pp.15

SADC economies have adopted the Maastricht type macroeconomic convergence criteria (see Table 3.2). Most of the member states have achieved those criteria, except during the recent years of global financial crisis. However, the European Monetary Union (EMU) experience proves that meeting those criteria does not guarantee successful monetary union. On average, main macroeconomic convergence indicators deteriorated slightly in 2011. Budget deficit to GDP and Public debt to GDP ratios increased slightly, while reserves (import cover in months) were somehow reduced. Nevertheless, budget deficit and public debt to GDP convergence targets were met in this period. In line with an uncertain international environment, SADC countries generally adopted soft economic policies as a general strategy to prompt growth. In general, reference interest rates were either maintained or reduced.

Table 3.2: Maastricht³ Type Macroeconomic Convergence Goals of SADC

Criteria	2008	2012	2015	2018
Inflation	<10%	5%	5%	3%
Budget deficit, % GDP	<=5%	3% as an anchor, proportion1%	3% as an anchor, proportion1%	3% as an anchor, proportion1%
Foreign debt, % GDP	< 60%	< 60%	< 60%	< 60%
Foreign reserve/ covered by exports	>=3month	> 6 month	> 6 month	> 6 month
Central bank debt	< 10% of the previous year tax revenue	< 10% of the previous year tax revenue	< 5% of the previous year tax revenue	< 5% of the previous year tax revenue

Source: Kumo (2011).

3.2 Challenges

Economic activity in SADC is hampered by infrastructural problems, energy sector inefficiencies, strong dependency on primary commodities, uncertainty from financial stress in the Euro Area and a possible rise in oil prices (UNECA, 2010). Economic developments in SADC economies have been affected by recent global uncertainty and financial turmoil in the Euro Area. Consequently, according to SADC performance indicators, economic activities have declined. Given rising oil and food prices, most member countries experienced a rise in domestic inflation rates (IMF, 2012). This underscores the need for sound fiscal and monetary policies in order to sustain macroeconomic stability and robust economic growth. Moreover, it stresses the need for extensive reforms to unlock the region's productive potential, promote trade and financial sector development as buffers to mitigate the disruptive effects associated to the increasingly uncertain global environment.

³These convergence criteria are presented in Article 121(1) of the Treaty establishing the European Community (EC Treaty). There are four of them (price stability, government finances (i.e. annual government deficit and government debt, exchange rates) and long-term interest rates) Zerihun et al. (2015). "The way forward on African Economic Integration Initiatives: Evidence from Southern African Development Community". Paper submitted for the Biennial Conference of the Economic Society of South Africa, University of Cape Town, Cape Town, South Africa, 2-4 September 2015.

4. Methodology and Data Sources

We use different methodologies to answer the research questions posed in this article. The following methodologies are employed in the empirical investigations. The technical presentations of these methodologies are available from Zerihun (2014).

- (1) A nonparametric method called the Triples test, along with two other methods of testing the co-movement of real business cycles in the region.

The Triples test was first developed by Randles et al. (1980) and Razzak (2001), respectively. We used the Triples test for its accessibility and superior results. The Triples test method is more efficient than many other methods used in the literature to detect symmetry. Furthermore, it is asymptotically distribution free, which means that the outliers and changes in the variance of the distribution of the time series cannot affect the test.

- (2) Johansen's multivariate co-integration technique and panel unit root tests for the period 1995-2012, using monthly Consumer Price Index (CPI) and nominal exchange rate data. Recent cross-sectional dependence augmented frameworks of panel unit root tests as found in IPS (2003) and LLC (2002) are used due to their superior power advantage over time series unit root tests.

- (3) To test for PPP in SADC we use two nonlinearity tests: the nonparametric methodologies developed by Brock, Dechert, and Scheinkman, known as BDS test, and the Fourier stationarity test. The BDS test detects the *independently and identically distributed (iid)* assumption of the time series used in the analysis. The Fourier approximation mimics a wide variety of breaks and other types of nonlinearities.

- (4) Lastly we investigate the strength of exchange rate based policies to affect the real effective exchange rate and also evaluate the long run equilibrium real effective exchange rate to find evidence of policy coordination. We apply a panel data analysis of the mean group (MG) estimator, pooled mean group (PMG) estimator (Kamar and Naceur, 2007; Pesaran, et al., 1996) and Pedroni (2004) panel cointegration tests, to

estimate the long-run relationship of the macroeconomic determinants of the real exchange rate in the SADC region. The goal is to explore for the possibility of policy coordination towards monetary integration in the region.

The following data sources are consulted to obtain relevant and undated data for the analysis in this study:

- World Bank's *World Development Indicators*, and *African Development Indicators*
- UN statistics, IMF's *International Financial Statistics*, and
- Other published UN and AU sources and publications including Central Banks of SADC member states.

Annex 1 and 2 present the descriptive statistics of the real GDP and real exchange rate data used in this paper.

5. Results and Discussion

The results and discussion in the section are on the basis of findings presented in the annexure. Firstly, we analysed the symmetry of business cycles in SADC as a first test to ascertain if these countries are affected similarly by shocks and if the paths to economic recovery are similar. The results give a rough idea of whether these countries would benefit from a uniform economic policy. The results from the Triples test confirm 10 out of 15 member states exhibit structural symmetry (see annex 3). Only five of fifteen SADC countries have asymmetric business cycles; the DRC, Malawi, Mozambique, South Africa and Swaziland all have negative asymmetric business cycles for the period (1970-2010). The overall results confirm that only some SADC member countries could potentially form a monetary union in the region based on traditional OCA theory. In light of the experience of EMU where just five small countries were able to create havoc in the entire union, the findings from the three tests confirm that there is not sufficient real business cycle convergence among all member states for the entry into the monetary union.

Secondly, from Johansen's multivariate co-integration test we get two specific test statistics: the *trace* and the *maximum Eigen-value*. In this paper the trace statistics indicate the existence of three co-integrating relationships among SADC real exchange rates while the maximum Eigen-value shows one cointegration relationship (see annex 4). The Eigen-values obtained in the analysis of these two statistics are less than unity, which implies that the systems of equations are stable and hence the results from the estimations are reliable. Therefore, the conclusion from these findings implies that Generalised Purchasing Power Parity (GPPP) holds in the SADC region. However, the absolute magnitudes of the short run adjustment coefficients of SADC countries' real exchange rates are low (see annex 5). The lower the absolute magnitude of the alpha coefficient, the slower becomes the speed of adjustment towards long run equilibrium. This finding implies that the observed slow speed of adjustment for (log) real exchange rate of SADC member states might constrain the effectiveness of stabilization policies in the wake of external shocks, rendering SADC countries vulnerable to macroeconomic instability in the region. Moreover, the magnitude of the long run beta coefficients of all the real exchange rates are below one except in the case of Mauritius and they all bear negative sign except in the case of Angola and Mauritius (see annex 6). We can take this evidence as supportive of monetary union in the region if we exclude Angola and Mauritius. These two countries may exhibit asymmetry in response to external shocks, disqualifying them from a SADC-OCA. In general the study concludes that the GPPP hypothesis holds for SADC economies given the stationary panel of RER series and cointegrating relationships amongst the system of RERs (see annex 7 and 8 for panel unit root test results). This implies that the region is potentially an OCA that could proceed with monetary integration.

Thirdly, as shown in annex 9 and 10, the findings confirm that the nonparametric BDS test detects the (*iid*) assumption of the time series. The Fourier approximation mimics a wide variety of breaks and other types of nonlinearities. Both tests confirm the non-linear nature of real exchange series of SADC economies. The result from the Fourier stationarity test further strongly supports an OCA in the region comprising the 11 countries included in the study. Given the long run dynamics of real exchange rates for the 11 member countries of SADC using the Fourier estimation method, our findings come out in support of the region being an OCA based on the PPP criteria. As suggested by Chang et al. (2009), these 11 SADC

countries could use PPP to predict a common exchange rate which would determine whether
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a currency is over or under-valued and experiencing differences between domestic and foreign inflation rates.

Lastly, we explore the possibilities for exchange rate based policy coordination towards monetary integration in SADC. Dynamic models of PMG and GM estimators and RER equilibrium and misalignment analysis are used. Out of ten macroeconomic structural explanatory variables used in the estimation five of them come out as significant determinants of RER among SADC economies (see annex 12). These variables are from the broad category of variables representing monetary-, fiscal-, and trade policy. This implies that SADC member states can use these policy variables as policy instruments to ensure exchange rate based policy coordination in the region to realise those anticipated benefits from an on-going integration process. The findings confirm persistent overvaluation in RERs, which is indicative of lower financial deepening and a higher tendency to currency crisis in the SADC region (see annex 13). This calls for further policy coordination and policy harmonisation in the region. These findings are consistent with earlier studies in other developing regions. The findings in this paper have important policy implications for financial sustainability and opt for welfare-gaining monetary integration in the region, accompanied by more coordinated RER policies.

6. Conclusion and the Way Forward

The overriding desire for greater economic independence and development is one of the strongest justifications for regional integration of the African continent. Africa's marginal contribution to the world economy is often blamed on weak regional integration (UNECA, 2012). Given this fact, deeper regional integration in Africa is thought of as a way to promote peace, security and stability by forcing a stronger commitment by members to unity within the African Union (AU).

An important part of economic integration is monetary integration, which include integration of financial and banking systems, policy coordination and ultimately the adoption of a common currency. In this study the focus was only on the readiness of monetary integration in the region.

The study concludes that there is overwhelming evidence that real convergence is met to some extent among SADC economies as a group; however, there is a slow pace of integration. By considering findings from all the empirical tests, the study finds that nine SADC countries can potentially constitute a SADCOCA namely, Botswana, Madagascar, Malawi, Mozambique, Seychelles, South Africa, Swaziland, Tanzania and Zambia. Angola and Mauritius are disqualified from a SADCOCA -at least for the sample period. Lesotho, the DRC and Zimbabwe are not included due to data limitations; otherwise Lesotho could join the qualifying group of countries given the long experience with the Common Monetary Area (CMA).

The relationship between bilateral real exchange rate series in SADC is nonlinear and policy coordination in the region is insufficient to form the proposed monetary union within the stipulated time frame. Advisably, there should be stronger policy coordination and public awareness to increase the benefits and decrease costs associated with the proposed monetary union in the region. These measures are a prerequisite before the adoption of a monetary union should SADC wish to avoid risk of facing the consequences faced by the EMU after the European financial crises. To reap the full benefits monetary (and real) integration in

SADC, would require a realistic time span, political will, common understanding and awareness, commitment and disciplined policy actions from all member states.

As the way forward, future studies on policy coordination in the SADC region and in SSA ought to:

1. Consider both the stabilizing and destabilizing elements of regional monetary cooperation and integration in the context of different forms of cooperation.
2. Focus on the inter-temporal aspects of fiscal and monetary policy coordination using dynamic game theory articulated to deal with '*Prisoner's Dilemma*' type of problems and credibility issues among SADC member countries.
3. Investigate the relevance of the Lucas Critique which emphasizes the use of fully-specified, optimisation based dynamic stochastic general equilibrium (DSGE) models for policy analysis; that is, to suggest econometric policy advice for SADC countries to join the proposed monetary union.
4. Use sophisticated statistical tools to fill the gap in the literature concerning the interaction between each of the OCA criteria against a background of monetary integration in the region. Such empirical findings will assist to judge whether SADC will function to realise the anticipated benefits from this gigantic regional initiative.
5. We further recommend for qualitative assessments to be carried for the purpose of exploring the perceptions of the stakeholders on the ongoing SADC monetary integration process.

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Annexure for Results

Annex.1: Descriptive Statistics of Growth Rate in Real GDP of SADC (1970-2010)

Country	Code	Mean	Median	Std. Dev.	Skewness	Kurtosis	p-value ⁴
Angola	AGO	4.06	3.15	8.43	-0.20	5.06	0.023
Botswana	BWA	9.10	8.44	6.05	0.93	4.77	0.004
Dem.Rep.of Congo	DRC	0.35	0.57	5.68	-0.52	2.42	0.296
Lesotho	LSO	4.65	3.60	7.08	0.78	4.93	0.005
Madagascar	MDG	1.55	1.71	4.40	-0.94	4.76	0.004
Mozambique	MOZ	4.58	5.62	5.38	-1.17	5.13	0.000
Mauritius	MUS	5.29	5.03	4.31	0.44	10.46	0.000
Malawi	MWI	4.22	4.34	5.83	-0.84	4.06	0.034
Namibia	NAM	3.49	3.37	3.44	0.94	4.48	0.008
Swaziland	SWZ	5.66	3.24	9.28	3.37	17.70	0.000
Seychelles	SYC	4.83	5.32	5.98	0.08	2.20	0.569
Tanzania	TZA	4.38	4.46	2.34	-0.74	3.34	0.141
South Africa	ZAF	2.58	2.84	2.34	-0.41	2.28	0.360
Zambia	ZMB	2.34	3.04	4.07	-0.46	2.48	0.384
Zimbabwe	ZWE	1.77	1.59	5.57	0.00	1.99	0.417
SADC (Average)		3.92	3.75	5.34			

Source, own calculations

Annex.2: Descriptive Statistics and Normality Test of SADC (Log) Real Exchange Rate

Country	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis	Jarque-Bera
Angola	4.460	4.479	5.627	1.966	0.551	-0.867	5.800	95.768***
Botswana	1.714	1.696	2.129	1.493	0.143	0.743	2.945	19.527***
Madagascar	7.438	7.453	7.894	7.171	0.152	0.114	2.155	6.767**
Malawi	4.629	4.680	5.107	4.083	0.215	-0.910	3.432	30.886***
Mauritius	3.300	3.335	3.492	3.093	0.111	-0.262	1.833	14.453***
Mozambique	3.118	3.104	3.457	2.874	0.146	0.559	2.463	13.603***
South Africa	1.909	1.884	2.528	1.592	0.193	0.975	3.992	42.273***
Seychelles	1.798	1.733	2.263	1.558	0.158	1.054	3.212	39.619***
Swaziland	1.949	1.911	2.580	1.581	0.207	0.832	3.416	25.979***
Tanzania	6.911	6.937	7.161	6.635	0.118	-0.470	2.462	10.357***
Zambia	8.476	8.601	9.066	7.904	0.316	-0.284	1.481	23.240***

⁴Jarque-Bera test for normality. It is test for the nested null hypothesis of normality *i.e.* skewness is zero and excess kurtosis is zero. In Table 4.1 shows that the calculated p-value is greater than any usual significance level (such as $\alpha = 0.10, 0.05$ or 0.01) to suggest that there is no evidence to reject the null hypothesis of a normal distribution for the daily returns of the Real GDP of SADC countries included in the sample.

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Source: Computed from sample data (1995m1-2012m8)

Note: ** and*** indicate significance at 5% and 1% levels, respectively. In all the cases the null hypothesis of normality is rejected.

Annex.3: Triples test statistics for symmetry (Obtained by Difference of log GDP)

Country code	$H_0: \eta = 0$	The Triples $H_0: \text{the univariate time series is symmetric}$			U-stat	P-value ($\alpha=0.05$)
		Ksi1(ζ_1)	Ksi2(ζ_2)	Ksi3(ζ_3)		
AGO	0.0285	0.0045	0.0230	0.1103	0.8328	0.1977
DRC	-0.0556	0.0026	0.0132	0.1080	-2.129	0.0154
LSO	0.0209	0.0070	0.0266	0.1107	0.5013	0.2912
BWA	0.0330	0.0054	0.0200	0.1100	0.9087	0.1711
MDG	-0.0473	0.0045	0.0188	0.1089	-1.406	0.0749
MWI	-0.0405	0.0047	0.0199	0.1095	-1.175	0.0401
MUS	0.0146	0.0077	0.0238	0.1109	0.3407	0.3632
MOZ	-0.0595	0.0045	0.0187	0.1076	-1.772	0.0314
NAM	0.0344	0.0037	0.0158	0.1099	1.1213	0.1251
SYC	0.0025	0.0040	0.0131	0.1111	0.0800	0.4801
ZAF	-0.0518	0.0017	0.0129	0.1084	-2.334	0.0094
SWZ	0.0972	0.0061	0.0228	0.1017	2.5073	0.0054
TZA	-0.0389	0.0037	0.0163	0.1096	-1.271	0.0885
ZMB	-0.0422	0.0060	0.0158	0.1093	-1.131	0.1251
ZWE	0.0055	0.0028	0.0127	0.1111	-0.203	0.4013

Source: author, computed from sample data

Note: The figures in bold show significant p-values at 5 percent level of significance and hence the null hypothesis is rejected which implies asymmetry in the series.

Annex.4: GPPP Test using Johansen multivariate co-integration test on SADC (Log) RER (Base currency = US\$)

Sample (adjusted): 1995M08 2012M10

Null hypothesis: no integration

Included observations: 207 after adjustments

Trend assumption: Linear deterministic trend

Series: *RERSA RERA RERB RERMA RERMD RERMU RERMO RERSC RERSW RERTA RERZA*

Lags interval (in first differences): 1 to 4

Hypothesized No. of CE(s)	Eigenvalue	Trace	1 %	Max-Eigen	1 %
		Statistic	Critical Value	Statistic	Critical Value
None***	0.418328	395.8688	293.44	112.1628	75.95
$r \leq 1$ ***	0.268538	283.7060	247.18	64.73099	69.09
$r \leq 2$ ***	0.248888	218.9750	204.95	59.24356	62.80
$r \leq 3$	0.190979	159.7314	168.36	43.86950	57.69
$r \leq 4$	0.152646	115.8619	133.57	34.28672	51.57
$r \leq 5$	0.125896	81.57520	103.18	27.85303	45.10
$r \leq 6$	0.090721	53.72216	76.07	19.68641	38.77
$r \leq 7$	0.070556	34.03575	54.46	15.14602	32.24
$r \leq 8$	0.047670	18.88973	35.65	10.11057	25.52
$r \leq 9$	0.030071	8.779158	20.04	6.320142	18.63
$r \leq 10$	0.011809	2.459016	6.65	2.459016	6.65
<i>Note: *** denotes rejection of the null hypothesis.</i>		<i>Trace test indicates 3 cointegrating equations at the 1% level.</i>		<i>Max-Eigen test indicates 1 cointegrating equation at the 1% level.</i>	

Source: own estimation

Annex.5: (Log) Real Exchange Rate Series Short-run Adjustment Coefficients (α)

RER series	Adjustment coefficients (α)	Standard Error
D(South African rand)	0.016662	0.03318
D(Angolan new kwanza)	-0.941522	0.12886
D(Botswana pula)	0.037468	0.02376
D(Malawian kwacha)	0.086315	0.03880
D(Malagasy ariary (MGA))	0.107311	0.02685
D(Mauritian rupee)	-0.024887	0.01444
D(Mozambique metical)	0.042243	0.02391
D(Seychelles rupee)	-0.016641	0.05774
D(Swazi lilangeni)	0.016270	0.03557
D(Tanzanian shilling)	0.022810	0.01770
D(Zambian kwacha)	-0.008818	0.03676

Source: Own estimation

Annex.6: SADC (Log) Real Exchange Rate Normalised long- run Cointegrating Equations
(β - Coefficients)

RER series (1 Cointegrating Equation: Log likelihood 4852.518)	Normalised Long run Cointegrating Equations (β - Coefficients)	Standard Error
South African rand	1.000	
Angolan new kwanza	0.160	0.031
Botswana pula	-0.818	0.345
Malawian kwacha	-0.137	0.075
Malagasy ariary (MGA)	-0.558	0.154
Mauritian rupee	1.616	0.252
Mozambique metical	-0.387	0.131
Seychelles rupee	-0.083	0.135
Swazi lilangeni	-0.779	0.273
Tanzanian shilling	-0.445	0.177
Zambian kwacha	-0.156	0.087

Source: Own estimation

Annex.7: Levin-Lin-Chu panel unit root test for SADC (Log) RER Series

t-statistics			p-value	
	Without time Trend	With time Trend	Without time Trend	With time Trend
Unadjusted t	-6.5519	-8.7189	0.0628	0.0002
Adjusted t*	-1.5314	-3.6077		
Notes:				
Ho: Panels contain unit roots			AR parameter: Common	
H ₁ : Panels are stationary			Panel means: Included	
			Number of panels = 11	
			Number of periods = 212	
Asymptotics : $N/T \rightarrow 0$				
LR variance: Bartlett kernel, 19.00 lags average (chosen by LLC)				

Source: Computed from sample data (1995m1-2012m8)

Annex.8: Im-Pesaran-Shin panel unit root test for SADC (Log) RER series

t-statistics			p-value		Fixed-N Values	Exact	Critical
	Without time trend	With time trend	Without time trend	With time trend	1%	5%	10%
t-bar	-1.5066	-2.1323	0.5265	0.0086	-2.040	-1.890	-1.810
t-tilde-bar	-1.4935	-2.1063					
z-t-tilde-bar	0.0665	-2.3823					
Notes:							
Ho: Panels contain unit roots			AR parameter: Panel-specific				
H ₁ : Some panels are stationary			Panel means: Included				
			Number of panels = 11				
			Number of periods = 212				
Asymptotics : $T, N \rightarrow \infty$ sequentially							

Source: Computed from sample data (1995m1-2012m8)

Annex.9: The BDS test results for the monthly RER series (Fraction of pairs)⁵

BDS Statistics of SADC Real Exchange Rates – country codes as local currency/USD											
H_0 = independent and identically distributed (<i>iid</i>), is rejected in all cases											
Country Codes ⁶											
m	ANG	BWA	MDG	MWI	MUS	MOZ	ZAF	SYC	SWZ	TZA	ZMB
2	0.169	0.1796	0.1650	0.1779	0.181	0.175	0.176	0.181	0.175	0.174	0.181
3	0.2857	0.3015	0.2745	0.2957	0.303	0.290	0.295	0.302	0.294	0.291	0.304
4	0.3610	0.3827	0.3446	0.3711	0.385	0.364	0.373	0.381	0.375	0.366	0.387
5	0.4114	0.4342	0.3869	0.4177	0.437	0.408	0.423	0.431	0.425	0.411	0.440
6	0.443	0.465	0.4103	0.4444	0.470	0.432	0.452	0.461	0.456	0.435	0.475
$c_{1,n}(\epsilon)$	0.7701	0.208	0.243	0.298	0.181	0.217	0.262	0.240	0.293	0.179	0.562
$k_1(\epsilon)$	3824810	3821906	3831102	3823116	3817066	3814646	3830134	3825536	3821180	3818034	3806902
V-Statistic	0.7033	0.7027	0.7045	0.7030	0.7019	0.701	0.7042	0.7034	0.702	0.702	0.700
P***<0.001, m=embedding dimension, Included observations (n): 2332											

Source: Computed from sample data (1995m1-2012m8)

The Fourier unit root test results are reported in Annex10 with the time paths of SADC countries included in this study. Given these findings, the Fourier approximations appear reasonable to use in detecting unit roots in SADC countries:

- (1) The third column in Annex10 shows the sum of square of residuals (SSRs). The F-test for SSRs for all the SADC countries included in the study is significant at the 1 percent level of F-test result. This result indicates that a single frequency works best for all of the SADC countries in the study.
- (2) The fifth column of Annex. 10 shows that the statistical values are all significant at a 1 percent level of significance. Thus, the hypothesis $\delta_1 = \delta_2 = 0$ is rejected using F-statistics F (k) of Table 3 in Enders and Lee (2004).
- (3) The last column in Annex 10 reports the results of unit root tests with a nonlinear function based on the estimated frequencies. All the T-statistic values for the 11 SADC member countries are significant at a 1 percent significance level.

⁵ There are other methods as well on the basis of how we select epsilon (ϵ) like; in the case fraction of pairs, ϵ is calculated so as to ensure a certain fraction of the total number of pairs of points in the sample lie within of each other. Fixed value: is fixed at a raw value specified in the units as the data series. Standard deviations: is calculated as a multiple of the standard deviation of the series. Fraction of range: is calculated as a fraction of the range (the difference between the maximum and minimum value) of the series. The default is to specify as a fraction of pairs, since this method is most invariant to different distributions of the underlying series.

⁶ See Table 1 for the full names of the countries.
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Annex.10: Stationary Test with a Nonlinear Fourier Unit Root Test

Country Code	Obs. (T)	SSRs	\hat{k} <i>Frequency</i>	$F_{\mu}(\hat{k})$	$\tau_{\mu}(\hat{k})$
AGO	200	1.295	1	220.18***	-7.033***
BWA	203	0.146	1	446.14***	-2.731***
MDG	210	0.227	1	418.91***	-3.841***
MWI	199	0.311	1	360.60***	-2.731***
MUS	204	0.052	1	554.05***	-1.298***
MOZ	199	0.131	1	446.58***	-3.529***
ZAF	203	0.248	1	392.53***	-3.004***
SYC	200	0.195	1	409.52***	-2.461***
SWZ	203	0.311	1	369.82***	-2.653***
TZA	199	0.058	1	525.94***	-3.085***
ZMB	203	0.349	1	357.99***	-0.410***

Source: Computed from sample data (1995m1-2012m8)

Annex.11: Panel of countries and variables definition

Panel of Countries	Dependent Variable	Independent/Explanatory Variables	
		Variable Code	Definition
Botswana	Real exchange rate	GEXP	Government Consumption = Public Consumption Expenditure / GDP (current, local currency)
Lesotho			
Madagascar		LIQ	Liquidity = Broad Money / GDP (current, local currency)
Malawi		OPEN	Degree of Openness = (Imports + Exports) / GDP (Constant, Local Currency)
Mauritius		TOT	Terms of Trade (Price of Exports to the Price of Imports)
Mozambique			
Namibia		CAPF	(Current Account Balance / GDP) (Current, USD)
Seychelles		TKF	Total Capital Flows (Net) (Current, USD)
South Africa		NKF	Net Capital Flows= the net of capital inflow and outflow(Current, USD)
Swaziland		NFA	Net Foreign Assets (current, local currency)
Tanzania		RESY	Stock of reserves at year-end / GDP (Current, USD)
Zambia			

Annex.12: Estimated parameters using real exchange rate (RER) as dependent variable

Variables	Pooled Mean Group			Mean Group (MG)		
Long-run coefficients	Coef.	Std.Error	P-value	Coef.	Std.Error	P-value
(ln)Liquidity	-1.19	0.233	0.000	-2.46	1.435	0.166
(ln)Gov. expenditure	0.178	0.163	0.274	1.434	0.236	0.000
(ln) Degree of openness	0.395	0.097	0.000	0.487	0.653	0.455
(ln) Reserve stock	0.192	0.075	0.011	0.411	0.263	0.118
Joint Hausman Test: 2.05 (0.8417)						
Test: Ho: difference in coefficients is not systematic						
Error Correction (ϕ_i)	-0.25	0.55	0.000	-0.61	0.217	0.005
Short-run coefficients	Coef.	Std.Error	P-value	Coef.	Std.Error	P-value
(ln)Liquidity	-0.31	0.235	0.184	-0.38	0.610	0.527
(ln)Gov. expenditure	0.256	0.100	0.315	-0.06	0.287	0.832
(ln) Degree of openness	0.259	0.129	0.315	0.036	0.189	0.848
(ln) Reserve stock	0.133	0.048	0.004	-0.005	0.103	0.962
Constant term	1.87	0.474	0.000	1.248	2.48	0.614
Log likelihood	258.3874			206.8795		
Number of Obs.	192			192		
Number of Countries	12			12		

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Source: authors - from estimation result

Note that in both cases the joint Hausman test for the null hypothesis is not rejected, so we can conclude that the **PMG** estimator, the efficient estimator under the null hypothesis is preferred

Annex.13: RER Misalignment Using Heterogenous Intercepts

