Feasibility of Monetary Union in the SADC and EAC: Evidence from Business Cycle Synchronisation

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Abstract: Through the Association of African Central Bank Governors, in 2003, Africa committed itself to work for a single currency and common central bank by 2021. In pursuit of this grand objective, many regional trading blocs including the Southern African Development Community (SADC) and the East African Community (EAC) are involved in various economic integration activities. Forming a monetary union is a serious endeavour that needs serious and deliberate consideration. Sufficient and sound economic basis, such as similar economic structures, should be in place. The purpose of this paper was to assess the feasibility of monetary union in the SADC and EAC by determining the similarities of the economic structures in the regions through business cycle synchronisation. This study uses annual real GDP of each country in the two regions for a period of 30 years. The results of correlation analysis and T-Y Granger causality test suggest that there is overwhelming lack of business cycle synchronisation in the two economic regions, suggesting that it is not feasible to form a monetary union in these two economic regions as envisaged in the timeframe. The two economic regions, therefore, need to set and coordinate major macroeconomic policies to harmonise and achieve sustainable economic development goals in their respective regions.

Keywords: SADC; EAC; monetary union; single currency; business cycle synchronisation

JEL Classification: E00

1. Introduction

Through the Association of African Central Bank Governors, in 2003, Africa committed itself to work for a single currency and common central bank by 2021 (Mboweni, 2003; Masson & Pattillo, 2004a; Guma, 2007). This commitment is in line with Article 44 of Abuja Treaty, which calls for the harmonisation of economic policies across the African continent. The treaty`s two important pillars of economic integration across the African continent are the promotion of intra-Africa trade and the enhancement of monetary co-operation (Mboweni, 2003).

In pursuit of this grand objective, many regional trading blocs and economic communities in Africa are in various economic integration activities. For example, the Southern African Development Community (SADC) is set to have a monetary union by 2016 and a single currency by 2018 (McCarthy, 2008; Kowlessur et al., 2013). Similarly, the East African Community (EAC), having established a customs union (CU) in 2005 and a common market in 2010, had planned to implement a monetary union, which will culminate in a political federation in the future (Buigut & Valev, 2005; Sheikh et al., 2013). The EAC member countries, in 2013, signed a Protocol on the establishment of the East African Community Monetary Union which sets a framework for the introduction of a single currency and the establishment of the East African Central Bank, whose mandate will be price stability, by 2024 (Drummond et al., 2015). Other regional blocs such as the Arab Monetary Union (AMA), the Economic Community of Central African States (ECCAS), the Common Market for Eastern and Southern Africa (COMESA) and the Economic Community of West African States (ECOWAS) are also in the process of integrating their

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economies for this purpose through the introduction of monetary unions in their respective regions (Masson & Pattillo, 2004a).

The rationale for the economic integration primarily influenced by the desire to counteract the perceived economic and political weaknesses of the continent and the successful launching of the euro (Masson & Pattillo, 2004b). Similarly, McCarthy (2008) is of the view that Europe has set the world a commendable example of economic integration and is largely seen as a role model in Africa in as far as monetary union is concerned. However, the move towards African economic integration should not be seen only from this perspective; there is a different narrative. The goal of a single currency has long been a pillar of African unity and a symbol of strength since the inception of the Organisation of African Unity (OAU) in 1936. (Masson & Pattillo, 2001)

In addition, macroeconomic interdependence is cited as the rationale of Regional Trade Agreements (RTA) across the world (Adom et al., 2010). Van Der Merwe and Mollentze (2010) are of the view that international interdependence has been on the rise since the 1970s and has generated spillover effects, also called externalities. The authors describe externalities as the benefits and cost that one country or a group of countries derive from the actions of other countries. To overcome the effects of externalities and develop their economies, countries across the world have been establishing different forms of regional economic integration at different degrees and levels promoted and supported by the United Nations Economic Commission for Africa (ECA). (Hartzenberg, 2011)

The ultimate goal of regional economic integration is to merge certain or all facets of the economic activities. This usually evolves from simple cooperation of mutually agreed economic activities amongst member countries to full economic integration or merger of the economies in question (Maruping, 2005). Forming a monetary union is a serious endeavour by any stretch of imagination that needs serious and deliberate consideration. Indeed, since independence, African countries have embraced regional integration as a key component of their development strategies and signed a number of regional integration arrangements (RIAs) (Hartzenberg, 2011). Such initiatives are good politics, but to survive they must extend beyond unfilled good intentions and have a sufficiently sound economic basis (Melo & Tsikata, 2013) because some of the initiatives are generally ambitious programs with unrealistic time frames towards deeper integration and in some cases even political union (Hartzenberg, 2011). The purpose of this paper is to establish the feasibility of monetary union in the SADC and EAC by determining the similarities of the economic structures in the regions through business cycle synchronisation.

Similarity of economic structures among potential member countries is considered an important facet in forming a monetary union, according to the optimum currency area (OCA) theory (Kenen, 1963). The OCA theory was pioneered by Mundell in 1961 in response to the prevailing debate on the merits and demerits of fixed versus flexible exchange rates (Ishiyama, 1975; Marco, 2014). McKinnon and Kenen also made important contributions to the theory. The ground-breaking work on the OCA later earned Mundell a Nobel Prize in economics, which subsequently paved the way for the establishment of the euro (Ngo, 2012, p. 66). Mundell rightly is regarded as the father of the OCA theory (Bayoumi & Eichengreen, 1998). Mundell (1961) describes an OCA as an "optimum geographic area" in which a group of countries share a common currency or maintain their own currencies, which have permanently fixed exchange rates with full convertibility. Dellas and Tavlas (2009) opine that similarity of economic structures and fiscal integration among economies are crucial aspects of Kenen's contribution to the OCA theory. De Haan et al. (2008) suggest that economies, whose business cycles converge, constitute good candidates for a monetary union.

GDP as comprehensive measure of economic activity is used to measure the symmetry/asymmetry of the economies in the two regions in this study. Numerous studies have utilised this approach (Artis &

Zhang, 2001; Zhang et al., 2004; Byström et al., 2005, p. 619; Amoah, 2013; Sheikh et al., 2013). High degrees of business cycle synchronisation amongst members of a monetary union are crucial for a smooth functioning of a given monetary union as it eases the management of economic policies, in particular, in applying a single monetary policy (Gayer, 2007, p. 2). De Haan et al. (2008) concur and suggest that economies whose business cycles converge constitute good candidates for a monetary union. Evidence on lack of synchronisation of growth rates across countries suggests only limited economic convergence of the economies concerned (Drummond et al., 2015, p. 5). It also is argued that monetary union by itself and the economic and financial integration of the economies could spur the occurrence of a common area-wide business cycle synchronisation (Gayer, 2007, p. 2). This paper seeks to establish the feasibility of monetary union in the two African economic regions namely SADC and EAC on the tenents of Kenen`s theory.

2. Research Methodology

Annual real GDP, as a percentage change, of all the countries in the two regions were downloaded from IMF (World Economic Outlook Database) from 1986 to 2015 (30 years) to assess business cycle synchronisation (similarities of economic structures). Similarity in economic structure is considered an important facet in forming a monetary union, according to the OCA theory (Kenen, 1963). De Haan et al. (2008) suggest that economies whose business cycles converge constitute good candidates for a monetary union. GDP as comprehensive measure of economic activity was used to measure the symmetry/asymmetry of the economies in the two regions in this study.

Correlation analysis and Granger causality test were used to assess the synchronisation of business cycles. The OCA states that member countries that aim to form a monetary union should have similar economics structures. To assess this, correlation analysis was found to be appropriate as applied in previous studies (Artis & Zhang, 2001; Zhang et al., 2004; Byström et al., 2005; Amoah, 2013; Sheikh et al., 2013). Correlation analysis explains the degree to which changes in certain variable are associated with changes in another variable (McDaniel & Gates, 2002). In assessing the size of the Pearson correlation coefficients, Cohen's d-measure of effect sizes was used to measure the importance of an effect. An absolute value ranging from 0.10 to 0.29 denotes a weak relationship, values between 0.30 and 0.49 represent a medium relationship and a value of 0.50 to 1.00 indicates a strong relationship between the variables (Pallant, 2013). A positive and significant correlation coefficient would indicate synchronous business cycle (i.e. having business cycle synchronisation) while a negative coefficient indicates asynchronous business cycle (i.e. lack of business cycle synchronisation).

To supplement the findings of correlations analysis, the pairwise Granger causality test was conducted. The Granger causality test is a statistical hypothesis test for determining whether one time series can be used in forecasting another (Granger, 1969). Granger causality test involves estimating the following Vector Autoregressive model:

$$\text{GDPA}_t = C_{10} + \sum_{i=1}^{n} \alpha_{1i}\text{GDPA}_{t-i} + \sum_{j=1}^{n} \beta_{1j}\text{GDPB}_{t-i} + e_{1t} \tag{1}$$

$$\text{GDPB}_t = C_{20} + \sum_{i=1}^{n} \beta_{2i}\text{GDPB}_{t-i} + \sum_{j=1}^{n} \alpha_{2j}\text{GDPA}_{t-i} + e_{2t} \tag{2}$$

Where GDPA_t and GDPB represent the real GDPt growth for country A and B at time t, respectively. α_{1i}, α_{2i}, β_{2j} and β_{1j} are the coefficients for the lags of the real GDP growth. C_{10} and C_{20} are the intercepts, while e_{1t} and e_{2t} are uncorrelated error terms. Equation (1) postulates that current GDPA_t is related to past values of itself as well as that of GDPB_t. Similarly, Equation 2 postulates that current GDPB_t is related to past values of itself as well as that of GDPA_t.

The hypothesis tests for both equations are set as follows:

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For equation 1:

- Null Hypothesis (H₀): $\beta_{11} = \beta_{12} \ldots = \beta_{1j} = 0$, GDPB *does not* Granger-cause GDPA

- Alternative Hypothesis (H₁): $\beta_{11} \neq \beta_{12} \ldots \neq \beta_{1j} \neq 0$, GDPB Granger-cause GDPA

For equation 2:

- H₀: $\alpha_{11} = \alpha_{12} \ldots = \alpha_{1j} = 0$, GDPA *does not* Granger-cause GDPB

- H₁: $\alpha_{11} \neq \alpha_{12} \ldots \neq \alpha_{1j} \neq 0$, GDPB Granger-cause GDPA

In equation 1, if the H0 is rejected then a conclusion can be drawn that the GDP growth rate of country B is related to In equation 1, if the H₀ is rejected then a conclusion can be drawn that the GDP growth rate of country B is related to its past economic performance and the economic performance of country A. Similarly, the rejection of H₀ in equation 2 implies that GDP growth rate of country A is related to its past economic performance and the economic performance of country B.

Prior to undertaking the Granger causality test, the Augmented Dickey-Fuller (ADF) unit root test was conducted to check if series are stationary. If variables are found to be stationary the normal Granger causality test is estimated. However, if variables are not stationary at level I(0), or are a mixture of I(0) and I(0) then the Toda & Yamamoto (T-Y) (1995) approach to Granger causality is utilised. Using the T-Y approach to Granger causality, our VAR model is expressed as follows:

$$GDPA_t = C_{10} + \sum_{i=1}^{n} \alpha_{1i}GDPA_{t-i} + \sum_{j=k+1}^{k+dmax} \alpha_{1j}GDPA_{t-j} + \sum_{i=1}^{n} \beta_{1i}GDPB_{t-i} +$$
$$\sum_{j=k+1}^{k+dmax} \beta_{1j}GDPB_{t-j} + e_{1t} \tag{3}$$

$$GDPB_t = C_{20} + \sum_{i=1}^{n} \beta_{2i}GDPB_{t-i} + \sum_{j=k+1}^{k+dmax} \beta_{2j}GDPB_{t-j} + \sum_{j=1}^{n} \alpha_{2j}GDPA_{t-i} +$$
$$\sum_{j=k+1}^{k+dmax} \alpha_{2j}GDPA_{t-j} + e_{2t} \tag{4}$$

Where: dmax is maximum order of integration for the group of time-series. Additionally, an optimal lag length was selected in the VAR system. The criteria used for lag selection include Logl statistic, LR test statistic, final prediction error (FPE), Akaike information criterion (AIC), Schwarz information criterion (SIC) and Hannan-Quinn information criterion (HQIC).

3. Results and Discussion

3.1. Synchronisation of Business Cycles in SADC

Correlation analysis and Granger causality test are used to examine the similarities of economic structure. Table 1 reports business cycle synchronisation computed through correlation analysis for the 14-member SADC region. Out of the 91 possible bivariate relationships only 12 were with positive and significant correlations, 25 with negative and insignificant correlations and 54 with positive but insignificant correlations. The 12 positive bivariate relationships showed medium-to-strong correlations coefficients when assessed against Cohen's d-measure effect sizes. Thus, they showed convergence in business cycles. However, these positive relations were mixed. In other words, the positive correlations were not necessarily among specific and recurring countries. These correlations (business cycle synchronisation) occurred between Angola and DRC, Angola and South Africa, Angola and Tanzania, Angola and Zambia, Botswana and Swaziland, DRC and South Africa, DRC and Tanzania, DRC and Zambia, Malawi and Zambia, Mauritius and Swaziland, Mozambique and South Africa and Tanzania and Zambia.

The biggest worry, however, is with bivariate relations that showed divergence in business cycles (25 with negative and insignificant correlations and 54 with positive but insignificant correlations). The 79 (25+54) of 91 bivariate relationships showed lack of business cycle synchronisation. It, therefore, is clear from the forgoing analysis that there is no convincing evidence that suggest business cycle synchronisation. The business cycle convergence noticed between the few bivariate relationships are just too little to suggest similarities in economic structure in the SADC region because the divergence in business cycle synchronisation is overwhelming. Thus, the SADC region does not constitute an OCA in as far as business cycle synchronisation is concerned.

The next step was to conduct Granger causality test for further analysis. Before conducting the Granger causality test, the unit root test was conducted. ADF results, in Table 2, show that some variables are stationary at levels, while others become stationary at first differences. This means that there is a mixture of I(0) and I(1), implying that the normal Granger causality cannot be used. Hence, the Toda and Yamamoto (Y-T) approach to Granger causality test was utilised to test for causal relationship between the various GDPs.

Table 1. Business cycle synchronisation for SADC (1986-2015)

COUNTRY	AGO	BWA	DRC	LSO	MDG	MWI	MUS	MOZ	NAM	SYC	RSA	SWZ	TAN	ZMB
Angola	1.00													
Botswana	0.18	1.00												
	0.33													
DRC	.600*	0.12	1.00											
	0.00	0.53												
Lesotho	-0.13	0.23	-0.09	1.00										
	0.51	0.22	0.63											
Madagascar	0.13	0.12	0.15	0.10	1.00									
	0.50	0.53	0.43	0.61										
Malawi	0.22	0.22	0.23	-0.02	0.02	1.00								
	0.24	0.25	0.22	0.93	0.92									
Mauritius	-0.19	0.35	-0.27	0.23	0.24	-0.10	1.00							
	0.32	0.06	0.15	0.22	0.19	0.62								
Mozambique	0.28	0.13	0.08	-0.22	0.04	0.26	-0.15	1.00						
	0.13	0.49	0.66	0.23	0.83	0.16	0.42							
Namibia	0.27	0.14	0.27	0.07	-0.17	-0.26	-0.07	-0.30	1.00					
	0.15	0.45	0.15	0.71	0.36	0.17	0.70	0.11						
Seychelles	0.04	0.29	-0.16	0.26	0.04	0.19	0.08	0.19	0.12	1.00				
	0.85	0.11	0.39	0.16	0.82	0.31	0.67	0.31	0.51					
South Africa	.649*	0.34	.377*	-0.03	0.35	0.15	-0.18	.430*	-0.02	0.13	1.00			
	0.00	0.06	0.04	0.87	0.06	0.43	0.34	0.02	0.91	0.48				
Swaziland	-0.02	.445*	0.03	0.04	0.11	-0.11	.602*	-0.08	0.01	0.14	-0.05	1.00		
	0.91	0.01	0.88	0.81	0.55	0.56	0.00	0.67	0.97	0.45	0.79			
Tanzania	.479*	0.16	.771*	-0.18	0.16	0.24	-0.10	0.09	0.17	-0.07	0.35	0.10	1.00	
	0.01	0.40	0.00	0.33	0.39	0.20	0.58	0.62	0.37	0.72	0.06	0.60		
Zambia	.445*	0.21	.554*	0.15	0.19	.487*	-0.17	0.17	0.10	0.06	0.31	-0.25	.534*	1.00
	0.01	0.26	0.00	0.44	0.32	0.01	0.37	0.36	0.59	0.74	0.09	0.19	0.00	
* Correlation is a least significant at the 0.05 level (2-tailed).														

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Yamamoto (Y-T) approach to Granger causality test was utilised to test for causal relationship between the various GDPs.

Table 2. Unit root test results of GDP growth for SADC countries

Countries	ADF (Level)		ADF (1st diff)		Order of integration
	t-Statistic	Critical values	t-Statistic	Critical values	
Angola	-2.969998	-2.9719	-5.1050	-2.9763	I(1)
Botswana	-4.425965	-2.9678	--------	--------	I(0)
DRC	-0.90437	-2.9763	-4.9153	-2.9763	I(1)
Lesotho	-4.11302	-2.9678	--------	--------	I(0)
Madagascar	-6.16752	-2.96778	--------	--------	I(0)
Malawi	-6.56583	-2.9678	--------	--------	I(0)
Mauritius	-4.38647	-2.9678	--------	--------	I(0)
Mozambique	-6.15208	-2.9678	--------	--------	I(0)
Namibia	-5.87598	-2.9678	--------	--------	I(0)
Seychelles	-4.504774	-2.9719	--------	--------	I(0)
South Africa	-3.06860	-2.9678	--------	--------	I(0)
Swaziland	-2.900884	-2.9678	--------	--------	I(0)
Tanzania	-1.13293	-2.9763	-5.6222	-2.9763	I(1)
Zambia	-5.78844	-2.981038	--------	--------	I(0)

Note 1: Test critical values for ADF is at 5%

The Y-T Granger causality test was conducted to supplement the outcome of the correlation analysis. The whole result of a pairwise Granger causality is not included in this paper in the interest of keeping space. Table 3 reports only a pool of those that showed significant Granger causality results. Of the 182 unidirectional Granger causality relationships, only 20 were found to be significant, at the 5 percent level of significance; indicating unidirectional Granger causality between the countries. The results of the Granger causality test confirm the results of the correlation analysis. The weight of evidence suggests that there is lack of business cycle synchronisation in the SADC region.

Table 3. Business cycle Granger causality test for SADC (P-values of Chi-square)

Null hypothesis	Probability
ANGOLA does not Granger Cause MADAGASCAR	0.0454
ANGOLA does not Granger Cause MALAWI	0.0145
ANGOLA does not Granger Cause Zambia	0.0005
BOTSWANA does not Granger Cause SOUTH AFRICA	0.0050
BOTSWANA does not Granger Cause SWAZILAND	0.0100
DRC does not Granger Cause MALAWI	0.0162
DRC does not Granger Cause TANZANIA	0.0153
DRC does not Granger Cause ZAMBIA	0.0011
LESOTHO does not Granger Cause SOUTH AFRICA	0.0345
NAMIBIA does not Granger Cause ANGOLA	0.0003
NAMIBIA does not Granger Cause ZAMBIA	0.0375
SOUTH AFRICA does not Granger Cause ANGOLA	0.0029
SOUTH_AFRICA does not Granger Cause MADAGASCAR	0.0273
SWAZILAND does not Granger Cause BOTSWANA	0.0005
SWAZILAND does not Granger Cause DRC	0.0309
SWAZILAND does not Granger Cause TANZANIA	0.0048
SWAZILAND does not Granger Cause LESOTHO	0.0296
TANZANIA does not Granger Cause ZAMBIA	0.0151

| ZAMBIA does not Granger Cause DRC | 0.0359 |
| ZAMBIA does not Granger Cause MOZAMBIQUE | 0.0071 |

3.2. Synchronisation of business cycles in EAC

Correlation analysis Granger causality test are used to examine the similarities of economic structure in EAC. Table 4 reports business cycle synchronisation computed through correlation analysis for the 5-member EAC region. The results indicate that out of the 10 possible bivariate relationships, three were with positive and significant correlations, only one with negative and insignificant correlations and six with positive but insignificant correlations.

The three positive bivariate relationships showed medium-to-strong correlations coefficients signifying high level of synchronisation. The common denominator in this positive bivariate relationship was Tanzania. These correlations (business cycle synchronisation) occurred between Tanzania and Burundi, Tanzania and Tanzania and Rwanda. The only clear divergence occurred between Burundi and Uganda showing asynchronous business cycles. The six positive with insignificant correlation could not show business cycle convergence (i.e. there is lack of business synchronisation).

It, therefore, is clear from the preceding analysis, whilst EAC region is in a much better position than the SADC region, that there is no convincing evidence that suggest business cycle synchronisation. The business cycle convergence noticed between the few (3 out of 10) bivariate relationships fall short of suggesting similarities in economic structure in the EAC region because of the existence of significant (7 out of 10) divergence in the business cycles. Thus, the evidence from the business cycle synchronisation suggests that EAC is not an OCA.

Table 4. Business cycle synchronisation for EAC (1986-2015)

	Burundi	Kenya	Rwanda	Tanzania	Uganda
Burundi	1.00				
Kenya	0.26	1.00			
	0.16				
Rwanda	0.11	0.10	1.00		
	0.58	0.60			
Tanzania	.404*	.615*	.394*	1.00	
	0.03	0.00	0.03		
Uganda	-0.35	0.02	0.18	0.10	1
	0.06	0.91	0.34	0.61	
*. Correlation is at least significant at the 0.05 level (2-tailed).					

To supplement the findings of the correlation analysis, Granger causality test computed but the unit root test was conducted to check if series are stationary. Table 5, show that there is mixture of I(0) and I(1), implying that Toda and Yamamoto approach to Granger Causality test (equations 3 & 4) should be used. Thus, the maximum order of integration for the group of time-series, dmax, is 1. The results of lag length selection (not reported here) show that our B-VAR model should be estimated with 2 lags. Thus, our VAR was estimated with one (dmax) additional lag on the top of the selected 2 lags.

Table 5. Unit root test results of GDP growth for EAC countries

Countries	ADF (Level)		ADF (1st diff)		Order of integration
	t-statistic	Critical values	t-Statistic	Critical values	
Burundi	-2.1747	-2.9678	-4.4317	-2.9719	I(1)
Kenya	-3.2778	-2.9678	----	-----	I(0)
Rwanda	-4.8471	-2.9678	----	-----	I(0)
Tanzania	-1.1329	-2.9763	-5.6222	-3.574244	I(1)
Uganda	-4.209310	-2.9678	----	-----	I(0)
Note 1: Test critical values for ADF is at 5%.					

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Results of T-Y Granger causality are summarised in Table 6. Of the 20 unidirectional Granger causality relationships, only two (2) were found to be significant, one at the 5 and 10 percent levels of significance. The lags of Kenyan GDP cannot be omitted in the equation for Tanzania (at the 5 percent levels of significance), implying that economic growth in Kenya Granger cause the economic growth in Tanzania. The lags of Uganda's GDP cannot be excluded in the Tanzania's equation (at the 10 percent levels of significance); suggesting the Ugandan economic growth Granger cause the economic growth in Tanzania. The results of the Granger causality test generally support the results of the correlation analysis although the correlation analysis had indicated some evidence of business cycle synchronisation. The overall results suggest there is indeed lack of business cycle synchronisation in the EAC region.

Table 6. Results of VAR Granger causality test for EAC (P-value. of Chi-square)

Excluded	Dependent variable				
	BURUNDI	**KENYA**	**RWANDA**	**TANZANIA**	**UGANDA**
Burundi	----------	0.0781	0.9968	0.1807	0.9896
Kenya	0.8815	---------	0.9390	0.0268	0.7627
Rwanda	0.1524	0.2677	--------	0.3831	0.7775
Tanzania	0.6380	0.2424	0.1952	--------	0.9243
Uganda	0.3846	0.2739	0.4554	0.0804	--------

From the foregoing analysis, it is evident that the weight of evidence suggests that there is lack of business cycle synchronisation in both of the economic regions. This lack of business synchronisation indicates dissimilarities of economic structures in the regions. Furthermore, these divergences in business cycles suggest that a common monetary policy, exchange rate policy and a single currency will not be optimal for the regions at this stage. Thus, both economic regions do not constitute optimum currency areas (Kenen, 1963; Masson & Pattillo, 2004; Gayer, 2007, Drummond et al., 2015). This is because countries with divergent economic structures and business cycles require appropriate domestic monetary and exchange rate polies that respond to their domestic economic conditions. This dissimilarity of economic structures and business cycles imply that a single monetary policy will not be appropriate for the region as a whole and therefore should not adopt a monetary union (Mkenda, 2001). Tavlas (2009) warns that countries that adopt a monetary union without having business cycle synchronisation are more likely to accrue negative consequences instead of economic benefits. The finding on the SADC region is consistent with that of Nzimande and Ngalawa (2016), a study conducted in the same region, which applied a Dynamic Factor Model. Similarly, the finding on the EAC region is also in congruence with a previous study conducted in the region (Buigut & Valev, 2005).

4. Conclusion and Recommendations

This paper has empirically assessed the feasibility of monetary union in the SADC and EAC regions by determining the similarities of the economic structures in the regions through business cycle synchronisation. The symmetry/asymmetry of the economies in the two regions was conducted through correlations analysis and Granger Causality Test. The correlation analysis of economic growth indicated that the SADC region does not constitute an OCA in as far as business cycle synchronisation is concerned. Whilst EAC region is in a much better position than the SADC region, however, there is no convincing evidence that suggests business cycle synchronisation, therefore, it also does not constitute an OCA. The results of the correlation analysis in both regions were confirmed through the T-Y Granger causality test, *inter alia* no evidence of business cycle synchronisation was found in the two regions.

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In a nutshell, both correlation analysis and Granger causality test suggest that there is overwhelming lack of business cycle synchronisation in the two economic regions. Both economic regions do not constitute optimum currency areas. Thus, it is not feasible to form a monetary union in these two economic regions as envisaged in their respective protocols. The two economic regions, therefore, need to set and coordinate major macroeconomic policies to further integrate their economies which will lead to more favourable conditions for a monetary union that shall take place in the future. The coordination of these macroeconomic policies will play a major role in achieving sustainable economic development goals in their respective regions. In addition to smoothing of business cycle synchronisation in the regions, this will also assist in alleviating the problem of excessive economic migration on the continent. A specific recommendation with regard to the SADC region is to expand the existing Common Monetary Area (CMA) which includes South Africa, Lesotho, Namibia and Swaziland gradually to other qualifying countries in the region instead of embarking a SADC-wide approach to a monetary union.

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