Business Cycle Synchronisation and the Prospects of a Monetary Union in the East African Community

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Abstract

Forming a monetary union has been a long-term objective of the East African Community. In this stage, member states adopt a common monetary policy that entails a use of a single currency purposively to cushion members against potential macroeconomic and structural shocks. However, the adoption of the common monetary policy is feasible only for countries experiencing similar macroeconomic shocks. In view of the above, the present study examines the potential for a successful East African Monetary Union. The study collected secondary data from the EAC facts and figures reports, and the African Development Bank database for the period between 2000 and 2013. The study examined a range of real and nominal variables whose data was obtained within this range. These include bilateral trade, openness to trade, trade specialization and economic specialization as well as exchange rate, budget deficit, financial openness, monetary policy, current account balance, and gross national savings. Correlation analysis was used to determine the degree of degree of convergence among EAC member countries, whereas the Ordinary Least Square based Extreme Bound Testing was used to

examine the determinants of the convergence. The findings indicate that in the pre-integration period, each member of the EAC had uncorrelated business cycle movement. In the post-integration period, however, member states seemed to have experienced some convergence. The convergence is attributable to common monetary policy, fluctuation in exchange rate, and financial openness. Nonetheless, the degree to which macroeconomic shocks are synchronised is still low. This implies that the adoption of a single monetary policy is still not feasible in the near future. To make the monetary union more feasible, the EAC member states should continue promoting intra-regional trade, which is anchored in a rule-based framework and political commitment.

Keywords: *East African Community*, M*onetary Union, Business Cycle Synchronisation, Extreme-Bound Analysis*

1.0 Introduction

The EAC, like all other African active regional economic integrations, is evolving through a conventional linear integration process, beginning with a free trade area followed by a custom union, a common market, economic union, and finally a political federation (Hartzenberg, 2011; Kone, 2012). The EAC was officially revamped in 1999 by the traditional East African countries of Tanzania, Kenya and Uganda following its demise in 1977. The EAC was a free trade area by 2001, formed a custom union by 2010, and reached a common market status by 2015. The signing of the monetary union protocol in 2013 provided a 10-year road map towards the East African Monetary Union (EAMU), hence, creating an opportunity for forming a common currency area (Buigut & Valev, 2005; Mafusere & Brixiova, 2012). In the long-run, however, the EAC aims at forming a

political federation, which completes the linear economic integration process.

The EAC's integration process, however, faces a number of challenges including countries' willingness to cooperate given the available costs and benefits (Magu, 2015) and the presence of non-trade barriers (Edwards & Rankin, 2016). In addition, financial integration has a different growth effect on different regional groupings. Furthermore, given countries' different institutional frameworks, the model of integration adopted faces a number of legal, political and economic challenges. In view of the above, cautious and a more flexible approach is imperative in the process of integration (Misati *et al*., 2015; Fagbayibo, 2016) so as to preserve the interest and values of member states.

Monetary union is a delicate project as it entails relinquishing one's monetary autonomy in order to adopt a common monetary policy. The theory of Optimum Currency Area (OCA) regards a successful monetary union as the one whose member states meet the shock synchronisation criterion. This is because in case member countries experience symmetrical shocks, a common monetary policy can effectively be used to cushion all the economies against the shocks (De Grauwe, 2016; Nguyen, 2007; Kishor & Ssozi, 2009). For asymmetrical shocks, the common monetary policy action is likely to be ineffective.

Empirical studies on the EAC integration is relatively scant (Sheikh, Zarina & Mohamed, 2013), and even more so are studies examining business cycle behaviours and synchronisation. The available studies (Buigut & Valev, 2005; Sheikh *et al.,* 2013; Mafusere & Brixovia, 2012) have analysed demand and supply shocks, whereas Kishor and Ssozi (2009) examined the evolution of business cycles (Kishor & Ssozi, 2009). The literature

generally concludes that there is low degree or partial shock convergence among member countries. However, the available literature is not an unequivocal as regard which factors underlying business cycle synchronisation in the region. The present study, therefore, contributes to the scanty literature in this region by examining the kinds of factors with substantial implication for the degree of business cycle synchronisation among member countries.

In a more specific way, the study contributes to knowledge to this topic in two major fronts. Firstly, it uses the business cycle model which allows a broad range of criteria within real, monetary and structural factors to be tested. It is understood that a success of a single monetary policy hinges on the commonality of both real economic and financial shocks. Hence, the model applied captures these aspects reasonably well. Secondly, the study applies the Extreme Bound Analysis (EBA) technique hence, departing from a more commonly used Structural Vector Autoregressive (SVAR) technique. The EBA technique is not only robust but can also offer more fresh, valid and reliable insights into our understanding of whether the EAC is truly an optimal currency area (Rana, Cheng & Chia, 2012; Bower & Guillemineau, 2009; Nguyen, 2007).

The paper proceeds by presenting the theoretical and empirical perspectives underpinning the study's problem in section two. This is followed by the descriptions of data, variables, and estimation strategy in section three. In section four, the paper presents the results of analysis and discusses the findings in the light of the theory and existing empirical literature. Finally, the study concludes and, highlights on the policy implications of the study's findings and avenues for further research in section five.

2.0 A Monetary Union and the Theory of Optimum Currency Area: A Review

In predicting a successful monetary union, the theory of Optimum Currency Area (OCA) has often been used. The theory was initially developed by Mundell (1961), and then further developed by Mackinnon (1963) and Kenen (1969). Essentially, the theory regards an OCA as a geographical region as opposed to a national territory in which member countries adopt a common currency (Mundell, 1961). To qualify as an optimum currency area, regions must possess certain characteristics. For example, labour mobility, capital mobility, and wage flexibility (Mundell, 1961), trade openness (Mackinnon, 1963), and fiscal harmonisation and similarities in economic structures (Kenen, 1969) have often been considered as imperative characteristics. However, recent development of the theory focuses more on the cost-benefit analysis of forming a monetary integration.

To test the OCA arguments, different methodological approaches have been applied. The analyses of shock synchronisation and business cycle synchronisation seem to dominate research in this field. The approaches suggest that the more countries face similar macroeconomic shocks or experience common business cycle behaviours the more beneficial it becomes to adopt a common monetary policy (Sheikh, Zarina, & Mohamed, 2013; De Grauwe, 2016; Frankel & Rose, 2002;). The two approaches are suitable as they comprehensively analyse a broad range of criteria required to assess the potential for forming the OCA.

Empirical studies in the East African Community can be mapped along the discussed methodological approaches. For example, Mkenda (2001) applied the General Purchasing Power Parity (G-PPP) model to analyse shock synchronisation. The study found

similarity in exchange rate movement (shock) between Kenya, Tanzania, and Uganda. Hence, the monetary unification was deemed possible. Similarly, Buigutand Valev (2005) used the same approch, but applying a two variable Structural Vector Autoregressive (SVAR) model to test for the presence of shock correlation between Tanzania, Kenya and Uganda. The findings indicate that there is low shock correlation among the three member states.

Furthermore, Mafusere and Brixovia (2012) added two more countries Burundi and Rwanda in their analysis, but yet concluded that forming a monetarry union in the EAC community is not feasible. Moreover, Sheikh *et al.* (2013) applied a four variable SVAR modelto analyze shock synchronisation, and found that domestic demand and external supply shocks are correlated, but monetary and domestic supply shocks are less correlated. The findings affirm that monetary unification is not feasible, but could be possible in the long-run. Yet, Kishor and Ssozi, (2009) decomposed the supply and demand shocks into common and individual components in line with Stock and Watson (1991). The study posited that countries with larger share of common components than individual components would tend to experience similar business cycles. The results of analysis indicate that the proportion of common shock across EAC community is low; implying that there is business cycles synchronisation is low.

The foregoing studies provide useful insights into the OCA and the analysis of the prospect of a successful monetary union. Nonetheless, the studies differ in the econometric models applied for analysing and testing the results. The present study applies the business cycle synchronisation approach, which is superior as it can account for a large number of variables. Furthermore, the study uses the gravity model and the Extreme Bound Analysis

techniques to provide fresh insights into the understanding of the synchronisation of business cycles of EAC member states. With this approach, the study intends to unearth the main drivers of business synchronisation and hence, providing a good account of the feasibility of the East African Community becoming a Monetary Union.

3.0 Data, Variable Definitions and Measurement

Data for this study was collected from various sources. Data on bilateral trade, and money supply were sourced from EAC facts and figures of 2013. Data on Real GDP, export and import, sectorial export and import, sectorial contribution to GDP, bilateral exchange rate, fiscal deficit, and current account balance was obtained from the UNCTAD database. Furthermore, data on gross national saving was collected from the African Development Bank (AfDB) database (dataportal.opendataforafrica.org/). Finally, data on gravity variable, distance, was obtained from time and distance website (www.timeanddate.com/worldclock/distance.html). All data collected is for the period between 2000 and 2013, which was within the reach of the research. Thus, a panel data set for respective variables across EAC member states (Burundi, Kenya, Rwanda, Tanzania and Uganda) was created in line with the measurement used in Djennas, Benbouziane, and Djennas (2013).

3.1 Measurement of the Dependent Variable

The dependent in this study is business cycle synchronisation. The degree of synchronisation of business cycle is examined using the correlation coefficients of the cyclical components of the countries' GDP (Inklaar *et al*, 2008). However, Pearson's correlation coefficients are unlikely to be normally distributed

without transformation. In that regard, Pearson correlation values are transformed using the following formula:

Correlation of countries cyclical GDP component;

$$Corr_{ij} = \frac{COv\,(Y_i, Y_j)}{\sqrt{Var(y_i) \times Var(y_j)}}$$

Transformed variable;

$$Syn_{ij} = Corr_{trans,ij} = \frac{1}{2}\ln\left[\frac{1+Corr_{ij}}{1-Corr_{ij}}\right]$$

Where, $Corr_{ij}$ is the correlation of GDP between country *i* and *j*. $COv\,(Y_i, Y_j)$ is the covariance of GDP for country *i* and *j*. $Var(y_i)$ and $Var(y_j)$ are variances for country i and j respectively. Finally, Syn_{ij} is the business cycle synchronisation.

3.2 Measurement of Explanatory Variables

Explanatory variables are grouped into two. The first group comprised of a set of real factors behind business cycle synchronisation, whereas the second group constitute a set of monetary/financial factors. The main determinant in real factor is trade. This is because as trading activities between countries intensify the economies are likely to experience similar structural shocks. Measurement of trade variables is as described below.

Bilateral trade (TRD): there are two measures of bilateral trade. The first measure is the average sum of bilateral exports and imports in country pairs all divided by the sum of total exports and imports. The second measure considers the ratio of the bilateral trade to total GDP as shown below:

$$Trade1_{ij} = \frac{1}{T}\sum_{t}\frac{X_{ij,t} + M_{ij,t}}{X_{i,t} + M_{i,t} + X_{j,t} + M_{j,t}}$$

$$Trade2_{ij} = \frac{1}{T}\sum_{t}\frac{X_{i,t} + M_{j,t}}{Y_{i,t} + Y_{j,t}}$$

Where, $Trade1_{ij}$ is the trade measure with relation to total trade, where $Trade2_{ij}$ is the trade measure with relation to GDP. $X_{ij,t}$ Is the export of country *i* to country *j*; $M_{ij,t}$ is the import of country *i* from country *j*.$X_{i,t}$, and $M_{i,t}$ are the export and imports of country *i* respectively. $X_{j,t}$ And $M_{j,t}$ are exports and imports of country *j* respectively. Finally,$Y_{j,t}$ and $Y_{i,t}$ are GDP of country *i* and *j* respectively. The present study used both measurements as separate variables.

Trade openness (TROP): this variable measures the degree to which an economy is open to trade (Baxter & Kouparitsas, 2005). This creates higher possibility for synchronous shocks when economies are very open (Mckinnon, 1963). Trade openness is measured a ratio of combined volume of trade to GDP. The value of trade openness is obtained using the formula below.

$$TROP_{ij} = \frac{1}{T}\sum_{t}\frac{\left(X_{i,t} + M_{i,t} + X_{j,t} + M_{j,t}\right)}{Y_{i,t} + Y_{j,t}}$$

Where, $TROP_{ij}$ is the openness of country *i* to country *j*. $X_{i,t}$ and $M_{i,t}$ are exports and imports of country *i* and *j* respectively. $X_{j,t}$and$M_{j,t}$, are the export and imports of country *j*. Finally, $Y_{i,t}$ and $Y_{j,t}$ are GDP values of country *i* and *j* respectively.

Trade Specialisation (TRSP): this variable is measured as the average of the difference of shares of sectorial exports to total exports. Less trade specialisation between economies implies more synchronisation of business cycles. This study considered

merchandise exports and service exports. The variable was obtained using the following equation:

$$TRSP_{ij} = \left[\left|\left(\frac{1}{T}\sum_{t=1}^{T} exs_{int}\right) - \left(\frac{1}{T}\sum_{t=1}^{T} exs_{jnt}\right)\right|\right]$$

Where, exs_{int}stands for share of the sector n in the total export of a country i, at time t; and exs_{jnt} stands for the share of the sector n in the total export of a country *j*, at time *t*.

Economic specialisation (ECS): this measures a share of an economic sector to the total output of an economy. It takes the differential sum of the sector shares in the total output of the economy. For purpose of this study, agriculture, industry and services were considered. The calculation was carried out using the following formula:

$$ECS_{ij} = \left[\left|\left(\frac{1}{T}\sum_{t=1}^{T} ecs_{int}\right) - \left(\frac{1}{T}\sum_{t=1}^{T} ecs_{jnt}\right)\right|\right]$$

Where ecs_{int} is the share of output of sector n in the total output of country i, at time t; and ecs_{jnt} is the share of output of sector n in the total output of country *j*, at time *t*. The sign of the coefficient of economic specialisation expects to be negative, implying that less specialised economies are more likely to be synchronous.

The second group of variables include policy and structural indicators, such as exchange rate, financial openness, monetary policy, current account balance and gross national savings.

Official exchange rate (OEXR): It is posited that the more variably the exchange rates are the less the synchronous business cycles would be. The variable is measured by taking the standard deviation of bilateral nominal exchange rate, and scaled up by the mean of the bilateral exchange rate over the sample period. The measure can be presented as follows:

$$OEXR_{ij} = \frac{\sigma(OEXR_{ijt})}{\frac{1}{T}\sum_{t=1}^{T} OEXR_{ijt}}$$

Where, $OEXR_{ij}$ is the official exchange rate between country *i* and country *j*. σ is the standard deviation of the bilateral exchange rate.

Fiscal Deficit (FIDD): it is posited that similar fiscal policies lead to increased correlation among variables between two countries (Frankel & Rose, 2002). The variable is measured as the absolute mean difference of the bilateral fiscal deficit (FD) ratios, as shown by the formula below:

$$FIDD_{ij} = \left| \frac{1}{T} \sum_{t=1}^{T} (FD_{it} - FD_{jt}) \right|$$

Where, $FIDD_{ij}$ stands for fiscal deficit deferential between country *i* and country *j*. FD_{it} stands for fiscal deficit for country i at time t; whereas FD_{jt} is fiscal deficit for country *j* at time *t*.

Financial Openness (FIOP): this indicator measures the extent to which capital can be transferred between countries. The more open capital account is the more it will be easy to transfer capital from one troubled region to the other hence, more synchronous business cycles will be. To measure this indicator, Chinn and Ito (2002) developed a standardised principle component of the inverse of the IMF binary indicators. Therefore, binary capital account openness is measured by the periodical average of the sum of the Chinn and Ito's indicators. The measure is presented as:

$$FOP_{ij} = kaopen_{ij} = \frac{1}{T} \sum_{t=1}^{T} (kaopen_{it} + kaopen_{jt})$$

Where, FOP_{ij} is the financial openness between country *i* and country *j*; which is equivalent to $kaopen_{ij}$ a representative of capital account openness. $kaopen_{it}$and$kaopen_{jt}$ are capital account openness for county *i* and *j* respectively.

Monetary Policy (MOP): this variable is computed using the Pearson correlation coefficient of the money and quasi money annual percentage growth (M2):

$$MOP_{ij} = Corr_{ij}(M2_{it}, M2_{jt})$$

Where, $Corr_{ij}$ is the correlation measure of $M2_{it}$and $M2_{jt}$ representing broad money for country i and county j at time t respectively.

Current Account Balance (CAB): this variable is defined as the ratio to the GDP of the sum of the net merchandise exports, service exports, income from abroad, and transfers. To capture the relation between current account balance and business cycle synchronisation, the pairwise Pearson correlation coefficients of the countries' current account balances were calculated using the formula below:

$$CAB\_corr_{ij} = Corr_{ij}(CAB_{it}, CAB_{jt})$$

Where, $Corr_{ij}$ is the correlation measure of CAB_{it} and CAB_{jt} representing current account balance for country i and county j at time t respectively.

Gross National Saving (GNS): the value of GNS is obtained by deducting total consumption and net transfers from gross national income. The numerator was then divided by the GDP. To

establish a relationship between gross national saving of two countries, the pairwise Pearson correlation coefficient between countries' gross national savings was obtained by the following formula:

$$GNS\_corr_{ij} = Corr_{ij}(GNS_{it}, GNS_{jt})$$

Where, $Corr_{ij}$ is the correlation measure of GNS_{it} and GNS_{jt} representing gross national savings for country i and county j at time t, respectively.

A priori expectation is that countries with converging monetary policies, current account balance and gross national savings would experience convergence of behaviours of their business cycles. This would be so if estimated regression coefficients on these variables are positive and significant (Djennas *et al*, 2013).

Furthermore, the study used distance measured in kilometres between major business centres of the trading countries as the gravity variable. According to the gravity theory of trade, distance affects the volume of trade between countries due to the rising transportation costs (Batra, 2006). Similarly, differences in tastes and cultures between countries can also affect the volume of trade (Baxter & Kouparitsas, 2005).

3.3 Econometric Estimation

The present study had two main objectives namely, to determine the degree of business cycle synchronisation and examine factors influencing it. In order to determine the degree of business cycle synchronisation, the cyclical component on annual GDP is separated from the trend component, and thereafter, a pairwise correlation analysis is conducted on the detached cyclical components in order to assess the degree of convergence. To detach cyclical component from trend component, Tatomir and Popovici (2013) suggest the use of non-paramentic filters like the the Hodrick-Prescott filter (HP), and Band Pass Filters like the

Baxter King filter (BK) and Christiano-Fitzgerald filter (CF). In line with Tatomir and Popovici, the study applies the Hodrick-Prescott filter with smotthing value of 100, which is appropriate for annual macroecnomic data.

The significant determinants of the BSC are identified based on the Extreme Bound analysis. The EBA techniques use a special OLS regression based on the following econometric model:

$$Y = \beta_i(I) + \beta_m(M) + \beta_z(Z) + \mu.$$

Where, Y is the dependent variable, business cycle synchronisation. Explanatory variables are grouped into three vectors namely, I, M and Z. Vector *I* constitute a set of always-included variables (such as the gravity variables). Vector *M* constitute candidate variables, which are tested for robustness. Vector *Z* represents all potential alternative variables hypothesised to determine BCS. In this analysis, M variable will meet robustness criteria only if it maintains the same level of significance given the choices of alternative explanatory variable, Z. This implies that a determinant of BSC must show consistent behaviour in all different regression combinations. This is not the case in a normal OLS regression, whereby addition or omission of alternative explanatory variables often produce mixed outcomes on the significance of the candidate variables (Baxter & Kouparitsas, 2005).

Furthermore, the original test for robustness in EBA technique is very strict, in the sense that if M variable is found to be insignificant in one of many regression combinations it is not considered as robust determinant. Simplifying this condition, Sala-i-Martin (1997) proposed the use of the entire distribution of estimated coefficient of M variable. According to this approach a significant determinant is one with estimated coefficients

normally distributed by 95% or higher, and at least 80% of the coefficients are significant (Nguyen, 2007).

4.0 Results of Analysis and Discussions of Findings

This section presents the results of the analysis of the degree of business cycle synchronisation and the factors determining it. The section then presents the discussions of the findings in the light of extant empirical findings and theoretical frameworks.

4.1 Analysing the Degree of Business Cycle Synchronisation

To determine the degree of business cycle synchronisation, the study used the HP filter to extract the cyclical component of real GDP for annual data at pre-integration (1986-2000), and at post integration (2000-2012). Thereafter, study conducted a Pearson correlation analysis to discern the degree of business cycle similarity across the member states. Table 1 shows the results of analysis.

The upper of the table reports the results for the pre-integration phase whereas the lower part the post-integration phase. The results suggest that during the pre-integration period the only significant co-movement was between Uganda and Burundi. The correlation coefficient of -0.56 suggests that the economies experienced asymmetric business cycles.

Table 1: Business Cycle Correlation Matrix

	Kenya	Tanzania	Uganda	Rwanda	Burundi
Kenya	1.000	0.065	0.230	0.323	0.065
Tanzania	0.640*	1.000	-0.015	0.551	0.387

Uganda	0.251	0.309	1.000	0.109	-0.555*
Rwanda	0.421	0.663*	0.556*	1.000	0.461
Burundi	0.150	0.265	0.713*	0.440	1.000

** $p \leq 0.05$*

In post integration period (2000-2012) most economies experience convergence in business cycles. This is evidenced by the increased significant and positive correlation coefficients, the highest being 0.71 between Uganda and Burundi. Other significant pairs include: Tanzania and Rwanda (0.66), Kenya and Tanzania (0.64), finally Uganda and Rwanda (0.56). This is a significant turnaround compared to the experience before integration. However, the presence of low and multiple insignificant correlation coefficients still suggest EAC economies are not fully synchronous despite considerable achievement in the implementation of the integration agendas. Therefore, to identify potential factors behind asynchronous and synchronous cycles, an EBA analysis was conducted.

4.2 Analysing the Determinants of Business Cycles Synchronisation

Results of analysis of Extreme Bound are shown in Table 2. The findings suggest that similarity of monetary policies and financial openness among member states explain the synchronous business cycles. Nonetheless, the divergence of the same is a result of exchange rate fluctuations. Unlike Mkenda (2001), this study found that a common exchange rate fluctuation exists as the variable exchange rate was positive and significantly different from zero. In this regard, it is reasonable to suggest that the EAC economies tended to rely on exchange rate adjustment to account for any internal and external economic shocks during the study period.

The study's findings suggest that monetary policy is the most significant determinant of EAC business cycle synchronisation since it passed both original test of robustness by Leamer (1983) and that by Sala-i-Martins (1997). This contradicts Sheikh *et al* (2013), whose study found low correlations in monetary policy. Such mixed findings could be largely attributable to variations in the methodologies used.

The variable financial openness is significantly associated with business cycle synchronisation, suggesting that there exist interlinkages in financial sector among the EAC member states. Such integration tends to spillover the macroeconomic fluctuations hence, increasing the synchronisation of business cycles (Kose *et al.*, 2003; Imbs, 2004).

It should be noted, however, that the majority of the variables explaining business cycle synchronisation were found to be insignificant. The implication of this is that there are quite few common criteria for synchronisation of EAC business cycles. Hence, there is generally low shock synchronisation in the region. Our results are consistent with the findings of Kishor and Ssozi (2009) and, Mafusere and Brixiova (2012).

Table 2: Results of the Extreme Bound Analysis

M variable	Type	Coef (β_m)	Std Error	Extreme Bounds Lower/Upper	Percentage of Significance	Leamer's Decision	Sala-i-Martin's (CDF)
TRD A	Baseline	-9.73	93.95				
	Max	227.96	108.36	-422.163	12.5	***Fragile***	53.828
	Min	-199.30	88.95	482.614			
TRD B	Baseline	-18.93	157.02				
	Max	399.52	185.84	-703.105	12.93	***Fragile***	54.448
	Min	-308.48	137.28	853.715			
TRDOP	Baseline	-1.18	0.91				
	Max	0.005	1.45	-6.254	23.94	***Fragile***	88.960
	Min	-3.47	1.42	2.904			
TRDSP	Baseline	0.00	0.000				
	Max	0.00	0.000	0.000	10.00	***Fragile***	71.083
	Min	0.00	0.000	0.000			
ECS	Baseline	0.00	0.000				
	Max	0.00	0.000	0.000	0.00	***Fragile***	54.653
	Min	0.00	0.000	0.000			
OEXR	Baseline	1.77	1.12				
	Max	7.03	1.44	-4.879	21.39	***Fragile***	93.063*
	Min	-0.46	0.91	9.855			
FIDD	Baseline	0.00	0.00		6.25	***Fragile***	74.210
	Max	0.00	0.00	-0.002			

M variable	**Type**	**Coef (β_m)**	**Std Error**	**Extreme Bounds Lower/Upper**	**Percentage of Significance**	**Leamer's Decision**	**Sala-i-Martin's (CDF)**
	Min	- 0.001	0.00	0.001			
FIOP	Baseline	-0.07	0.03				
	Max	0.02	0.02	-0.190	28.00	***Fragile***	98.223*
	Min	-0.11	0.03	0.103			
MOP	Baseline	18.56	3.20				
	Max	26.41	4.05	4.407	100	***Robust***	100
	Min	10.26	2.97	35.818			
CAB	Baseline	-0.65	1.24				
	Max	3.46	1.57	-5.553	14.29	***Fragile***	69.446
	Min	-3.40	0.69	6.614			
GNS	Baseline	-0.01	0.50				
	Max	1.27	0.89	-2.515	2.89	***Fragile***	50.754
	Min	-1.11	0.69	3.037			
I variable							
DIS	Baseline	0.00	0.00				
	Max	0.001	0.00	-0.001	18.31	***Fragile***	88.926
	Min	-0.001	0.00	0.001			

* CDF (0) is higher than 95% but Fragile.

5.0 Conclusion, Policy Implications and Further Research

The present study analyzed the degree of business cycle syhronisation, and the factors influencing it within the EAC region with the purpose of assessing whether or not the region is or has the potential ofr becoming an Optimal Currency Area. Using the HP filter on annual GDP data at pre and post integration periods, the study found significant but low improvement in the degree of synhronisation after integration. As regard the factors behind such symhronisation, the study found that flactuations in exchange rates, similarity in monetary policies, and financial openess influencethe EAC business cycles synhronisation. Further, the majority of the potential determinants were insignificant, affirming earlier findings that shock synhronisation in the region is still low.

In view of the foregoing, it seems reasonable to conclude that forming a successful common monetary policy and thus becoming an optimum currency area is still feasible but not an objective that can be realised in a very near and foreseable future. Member states are urged to commit more efforts towards facilitating intra-regional trade, since trade is the main driver through which economies can converge. Thus, efforts to remove non - tariff barriers and improve regional institutional capacities as well as providing clear definition of rules of origin and improving infrastructure linking port and land locked member states such as Uganda, Rwanda, and Burundi is indispensable. However, achieving these targets requires both a rule based framework and political commitment by member states. The former should ensure discipline in the preparation and implementation of agreed policies, whereas the later should ensure commitment among member states towards enhancing prosperity of the region.

However, the findings of the study hould interpreted within the following limitations, of which future rsearch can work to improve. Firstly, based on the current findings it is difficult to discern where the synchronous shock originates. It is, thus, recommended that future studies should apply the fixed effect least square model combined with the extreme bound analysis estimation technique. Secondly, there could be a global effect influencing the variables across the region at the same time. For example, it is understood that the EA region trade intensively and receive substantial FDI from China. This should be empirically tested to see whether its bring about more synchronious business cycles.

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