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DISCUSSION PAPER SERIES

IZA DP No. 15210

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ISSN: 2365-9793

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ABSTRACT

Are the East African Community's Countries Ready for a Common Currency?

This paper investigates the East African Community (EAC) partner states' readiness for a common currency. It uses recent data to assess the impact of policy coordination in the region during the last seven years of East African Monetary Union's protocol implementation. Despite some similarities in the structures of EAC economies, EAC member states remain susceptible to asymmetric shocks. Inflation is in the process of converging in EAC, but the speed of convergence is slow. Time is needed for preparing and for harmonizing policy before adopting the common currency. Adopting a common currency will lead to considerable costs for EAC countries.

JEL Classification: E42, F33, N17, O23

Keywords: East African Community, monetary union, common currency, policy harmonization, convergence, regional integration

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1. Background

According to the protocol on the establishment of the East African Community Monetary Union (EAMU), the East African Community's (EAC) countries are expected to adopt a single currency by 2024. EAMU is at the third stage of the regional integration process which follows the establishment of a customer union and a common market followed by a political federation (EAC, 2000).

An assessment of the costs and benefits of the monetary integration has been generally guided by the theory of optimum currency area (OCA) developed by Mundell (1961); McKinnon (1963); and Kenen (1969). The benefits are directly related to the elimination of transaction costs because of the use of different currencies for facilitating trade between the countries while costs are related to the inability of individual countries' central banks to use country specific monetary and exchange rate policies as instruments of macroeconomic adjustments. The basic point of OCA is that countries or regions adopting a common currency may be exposed to symmetric shocks or possess mechanisms such as wage flexibility and /or labor mobility, for the absorption of asymmetric shocks.

There exist a limited number of studies that analyze the readiness of EAC countries to adopt a common currency by assessing the synchronization of business cycles in the region. The main finding of these studies is that there is no clear evidence on the synchronization of business cycles and macroeconomic convergence in EAC member states. This shows that there could be substantial costs of a fast-tracked process of adopting a common currency before putting in place minimum requirements (Asongu, 2014a, 2014b; Buigut, 2011; Buigut and Valev, 2005; Drummond et al., 2015; Falagiarda, 2010; Kamaludin et al., 2013; Kigabo-Rusuhuzwa, 2018; Kigabo-Rusuhuzwa and Masson, 2012; Lepetit et al., 2014; Mafusire and Brixiova, 2013; Masson, 2016; Umulisa and Habimana, 2018).

Another aspect that has been recently analyzed is the inflation convergence in EAC (Dridi and Nguyen, 2018; Kishor and Ssozi, 2010). These two papers support inflation convergence in EAC. Inflation convergence is key for the effectiveness of a currency union because it is an indicator of structural synchronization between countries. Differences in inflation can result from heterogeneities in the productivity growth of the tradable sectors as compared to the non-tradable sectors, or the Balassa-Samuelson effect. On the other side, if differences in inflation patterns among country members of a monetary union are persistent, it will be difficult to implement a common monetary policy and will lead to disparities in real interest rates and exchange rates with different economic implications.

While our paper builds on these studies, it differs from them in two major ways. First, using more recent monthly data covering the period from January 2000 to July 2019, we assess the impact of harmonization of economic policies in the region. The period includes the last seven years of the EAMU protocol's implementation aimed at facilitating the adoption of a

common currency by 2024. For example, the monetary affairs committee (MAC) of EAC's governors of central banks has made significant progress in the harmonization of monetary policy frameworks. All central banks in EAC have agreed to move to more market based monetary policies from monetary targeting regimes and all of them have agreed on the period to move to a price based monetary policy before 2024.

To achieve this objective, EAC's central banks have decided to harmonize their monetary policy operations, develop a liquidity forecasting framework, and adopt forecasting and policy analysis systems (FPAS) not only as a forecasting system but also as a tool of guiding members of monetary policy committees in their decisions about monetary policy stances. Further, a regional monetary policy communication strategy has been developed and is now being implemented by all EAC central banks to increase their credibility and contribute to anchoring the expectations of economic actors. All these efforts aim at helping EAC's central banks to control inflation, which is their core objective (MAC, 2017).

Second, we analyze inflation convergence and assess whether the implementation of the EAMU's protocol has contributed to accelerating that convergence. To achieve this objective, we evaluate if in each EAC member state, the speed of convergence increased after the signing of the EAMU protocol compared to the period before the adoption of the protocol.

In the case of EAC, business synchronization and inflation convergence prior to the adoption of an EAC currency union is crucial because traditional adjustment mechanisms for macroeconomic shocks such as wage flexibility and /or labor mobility are still limited in the region. The free movement of workers within EAC remains constrained by a number of obstacles including the fear that citizens from other countries may take away jobs from local citizens; lack of procedures for mutual recognition of professional qualifications and experiences; and language barriers, especially in countries where the use of English is limited like in Burundi (Alper et al., 2016).

This research contributes to literature in a number of ways. Its results show that despite some similarities in the structures of EAC economies, the member states remain susceptible to asymmetric shocks. The member states have made progress in the process of inflation rate convergence in EAC, but the speed of convergence been slower than desired. Our results suggest that there is a need for an extension of the period for preparation and policy harmonization before the adoption of the common currency. It is evident that adopting a common currency in the next four years will lead to considerable costs for EAC member countries. More efforts are needed to ensure policy coordination, free movement of labor, and flexibility in EAC labor markets to provide mechanisms for adjustment in a monetary union with asymmetric shocks. Regional institutions need to be established to facilitate the

establishment of the EAC central bank. These are among the challenges facing EAC in its journey towards full regional integration.

The rest of the paper is structured as follows. Section 2 gives related literature. Section 3 gives the methodology used before discussing the empirical results in Section 4. Section 5 gives some policy recommendations.

2. Related literature

Empirical research on the feasibility of monetary unions differs in terms of empirical methodologies, countries considered, and sample periods. Studies use various methodologies, including: (i) analyzing correlations of real growth rates, exchange rates, and terms-of-trade; (ii) correlations of shocks identified using a statistical transformation of the data or a structural vector autoregression (SVAR) model; (iii) a cointegration VAR approach; (iv) convergence of different macroeconomic variables; and (v) more recently studies have used a wavelet analysis.

Vector autoregression (VAR) techniques have been used for separating demand and supply shocks in each country member of (or candidate for) a monetary union and then, correlation coefficients of similar shocks in those countries are compared. Bayoumi and Eichengreen (1994) were among the first to identify the underlying structural shocks using the VAR technique developed by Blanchard and Quah (1989) across members of the former European Community (EC) and comparing them to the ones prevailing in the United States. They concluded that asymmetric supply shocks were likely to continue after monetary unification, while asymmetric demand shocks were likely to diminish since they are partly policy induced. Thus, countries that are confronted with relatively large asymmetrical supply shocks are not likely to be good candidates for a monetary union.

Since then, a large number of studies have applied this methodology or a related approach to different country groups in Europe (for example, Bayoumi and Taylor, 1995; Bayoumi and Ostry, 1995; Fidrmuc and Korjonen, 2001; Frankel and Nickel, 2002; Kouparitsas, 1999; Ramaswamy and Slok, 1998); in East Asia (for example, Etta-Nkwelle et al., 2012; Yuen and Ling, 2001; and Zhang et al., 2004); and in EAC as mentioned in the introduction of this paper.

A recent paper by Umulisa and Habimana (2018) used a wavelet analysis which combines time and frequency domain analyses. They concluded that the five EAC countries were not ready for a common currency because there exist significant asymmetric shocks that affect economic activities in the EAC countries. In addition, they identified the prevalence of core-periphery patterns. Kenya, Tanzania, and Uganda formed the core, whereas Burundi and Rwanda tended to cluster together into a peripheral group.

Another aspect that has been recently analyzed is inflation convergence in EAC (Dridi and Nguyen, 2018; Kishor and Ssozi, 2010). The first study uses a set of panel unit root tests and a global vector autoregression based on data covering the period January 2000 to February 2015 while the second uses an unobserved component model in additional to panel unit root tests with data covering the period March 1981 to January 2009. The two papers support inflation convergence in EAC and conclude that convergence can be explained by domestic factors and by a larger role of foreign factors (Dridi and Nguyen, 2018).

A popular approach for testing the convergence of inflation is using standard univariate unit root test or the Dickey–Fuller test (for example, Charemza et al., 2005; Nelson and Plosser, 1982). However, these tests are known to have low power particularly in rejecting the null hypothesis of a unit root when it is false due to different factors including a limited number of observations. To overcome such a problem, several methods have been proposed including panel-based unit root tests which are used the most in empirical studies on convergence of inflation among countries.

In general, two groups of panel unit root tests are distinguished in literature based on the features of cross-sectional dependencies (Hurlin and Mignon, 2007). The first group of tests assumes that all cross-sections are independent while the second group of tests takes into account cross-unit dependencies.

3. Methodology

Our empirical analysis of EAC countries' readiness for a common currency in 2024 is based on two different methodologies applied to recent data from the harmonization period. First, we analyze the correlations in the shocks identified using a VAR model. Second, we use unit root panel tests to analyze inflation convergence in EAC countries.

3.1. VAR models

We estimate a bivariate VAR model using the log of real GDP and inflation, adopting Blanchard and Quah's (1989) identification scheme to separate supply and demand shocks in each EAC country. Then, to analyze the similarities in the shocks between countries we compare correlation coefficients for the same type of shocks (demand and supply shocks).

Demand and supply shocks are considered symmetric if their correlations are positive and significant and in that situation countries are ready to form a monetary union. On the other side, when the correlations are negative, the shocks are considered asymmetric and the conditions not optimal for forming a monetary union.

The model is set up as follows. Let:

$$y_t = (\Delta y_{1t}, y_{2t})' \tag{1}$$

where y_{1t} is the log of real GDP and hence Δy_{1t} is the growth rate of real output, and y_{2t} is the inflation rate which is calculated as the change in the headline consumer price index. To reflect the dynamics from period t-1 to t, we specify the following structural model:

$$\beta y_t = \gamma_0 + \Gamma_1 y_{t-1} + \varepsilon_t; \varepsilon \to i.i.d.(0, \sigma^2) \tag{2}$$

where $\varepsilon_t = (\varepsilon_{dt}, \varepsilon_{st})'$; ε_{dt} are demand shocks and ε_{st} are supply shocks, and they are orthogonal. Considering that β^{-1} exist, we obtain the following reduced form of VAR:

$$y_t = a_0 + A_1 y_{t-1} + u_t \tag{3}$$

where $a_0 = \beta^{-1}\gamma_0; A_1 = \beta^{-1}\Gamma; u_t = \beta^{-1}\varepsilon_t$, and A_1 represents the impulse response functions of the shocks to the growth of real GDP and inflation. Applying the Wold Decomposition theorem on Equation (3) which states that any covariance stationary process can be decomposed into two mutually uncorrelated component processes, we derive the structural moving average representation of y_t which can be used for generating the impulse response functions as:

$$y_t = \mu + \varphi(L)\varepsilon_t \tag{4}$$

where μ is a vector of constant means and L is a lag operator. In matrix form Equation (4) can be expanded as:

$$\begin{bmatrix} \Delta y_{1t} \\ y_{2t} \end{bmatrix} = \begin{bmatrix} \mu_1 \\ \mu_2 \end{bmatrix} + \begin{bmatrix} \varphi_{11}^{(0)} & \varphi_{12}^{(0)} \\ \varphi_{21}^{(0)} & \varphi_{22}^{(0)} \end{bmatrix} \begin{bmatrix} \varepsilon_{dt} \\ \varepsilon_{st} \end{bmatrix} + \ldots \tag{5}$$

Hence, the impulse response functions are derived as:

$$\theta_{11}^{(s)} = \left[\frac{\partial \Delta y_{1t+s}}{\partial \varepsilon_{dt}}\right]; \varphi_{12}^{(s)} = \left[\frac{\partial \Delta y_{1t+s}}{\partial \varepsilon_{st}}\right]; \varphi_{21}^{(s)} = \left[\frac{\partial y_{2t+s}}{\partial \varepsilon_{dt}}\right]; \varphi_{22}^{(s)} = \left[\frac{\partial y_{2t+s}}{\partial \varepsilon_{st}}\right]. \tag{6}$$

Considering that demand shocks do not affect the level of output in the long run, while both shocks may affect the price level, this implies that the cumulative effect of demand shocks on real GDP is zero, that is, $\varphi_{11}(1) = \sum_{s=0}^{\infty} \varphi_{11}^{(s)} = 0$. Thus, to identify the matrix β in the structural VAR, we use the long run matrix:

$$q(1) = \begin{bmatrix} 0 & q_{12}(1) \\ q_{21}(1) & q_{22}(1) \end{bmatrix}. \quad (7)$$

Combining Equations (4) and (7), we express output and inflation as a function of demand and supply shocks as:

$$\varepsilon_t = (y_t - \mu) q(1)^{-1} \quad (8)$$

To extract structural shocks, the VAR for each country is estimated. The number of lags is determined based on the Akaike Information Criterion (AIC) and the Bayesian Information Criterion (BIC).

3.2. Panel-based unit root tests

We denote Y_{it} the headline inflation in country i, i = 1, ...,5, defined as the monthly percentage change in the headline consumer price index with monthly data covering the period from January 2000 to July 2019. We denote $X_{ijt} = Y_{it} - Y_{jt}$ representing the inflation differential between countries i and j at time t and with five EAC countries we construct 10 series of pairwise inflation differentials. The Bai and Ng (2004) test is used for assessing if these differentials converge. Bai and Ng (2004) are among popular tests used in empirical research on convergence among macroeconomic variables allowing heterogeneity in cross sections. Increased intra-regional trade in EAC, especially after the treaty which came into force in 2000, has increased the ties between EAC economies and amplified the impact of regional factors on country specific inflation (Kigabo-Rusuhuzwa, 2018). Intra-EAC trade increased by 93.6 percent between 2008 and 2018, from USD 1,230.8 million to USD 2,382.6 million (EAC, 2017; Kigabo-Rusuhuzwa, 2018).

Bai and Ng (2004) suggest a factor analytic model by decomposing a time series X_{it} into a deterministic component and a vector of common factors:

$$X_{it} = D_{it} + \lambda_i^{'} F_t + e_{it} \quad (9)$$

where D_{it} is a polynomial trend function, F_t is a $rx1$ vector of common factors, λ_i is a vector of factor loadings, and e_{it} is an error term that is largely idiosyncratic and assumed to be cross-sectional independent. The two components are unobserved and are estimated using principal components on the first difference model.

X_{it} is said to be non-stationary if at least one common factor of the vector F_t is non-stationary and/or the idiosyncratic term e_{it} is non-stationary because the two components are

independent. Bai and Ng (2004) proposed the Panel Analysis of Nonstationary in the Idiosyncratic and Common Components (PANIC) to test the presence of a unit root in the common and individual components separately rather than directly testing the non-stationarity of X_{it}.

Denote r the number of common factors, with $r = r_0 + r_1$. r_0 is the number of stationary factors and r_1 the rank of the matrix C(1) which is the number of independent stochastic trends underlying the r common factors. Bai and Ng (2004) determine r_1 and test the presence of a unit root in each of the idiosyncratic errors. Two statistics are used, MQf and MQc, to determine r_1. The first test filters factors considering that they have $VAR(\infty)$ representation and the second corrects for possible serial correlation. For the idiosyncratic component unit root tests and two Fisher type statistics ZBN and PBN are used.

For robustness of the findings about inflation differentials' convergence or divergence among EAC countries, we also use Moon and Perron (2004) as well as Chang (2002) tests. Moon and Perron (2004) propose two test statistics t_a^* and t_b^* while Chang (2002) uses the IV t-ratio statistic based on a non-linear IV estimation of the augmented Dickey Fuller type regression.

We also analyze the speed of convergence of country inflation $X_i (i = 1,...,5)$ to EAC inflation ($\inf_{EAC,t}$) calculated as the average of member countries' inflation rates. The speed of convergence is estimated by modeling the inflation differential as an AR(1) process (see for example, David, 1996 and Kocenda and Papell, 1997):

$$Z_{jEACt} = \phi Z_{jEACt-1} + \varepsilon_t \; ; \; \varepsilon \to i.i.d.(0, \sigma^2) \tag{10}$$

with $Z_{iEAC,t} = X_{i,t} - \inf_{EAC,t}$, i=1,…,5, t=1,…,T

Assuming that inflation differentials decay at an exponential rate illustrated by:

$$\lambda_{it} = \lambda_0 e^{-rt} \tag{11}$$

where $\lambda_{it} = Z_{jEACt}$; and r is the rate of decay or speed of convergence. Using Equations (10) and (11), we show that:

$$r = \ln Z_{jEACt} - \ln Z_{jEACt-1} = \ln(\delta_{it} - \delta_0) = -\ln(\hat{\phi}) \tag{12}$$

This equation indicates that convergence requires that inflation differentials become smaller and smaller over time, that is, ϕ is statistically significant and less than one. If ϕ is insignificant any shock will not have an impact in the next period and we conclude that

inflation has already converged. To assess whether inflation in EAC has converged more in the post EAMU protocol period, we calculate the speed of convergence using Equation (12) in the pre- and post-EAMU protocol periods.

4. Empirical Results

4.1. An analysis of demand and supply shocks

To extract the structural shocks, we estimated the VAR model for each country. The number of lags is determined based on the Akaike Information Criterion (AIC) and the Bayesian Information Criterion (BIC) lag lengths. Unit root tests on the log of real GDP and inflation using the Augmented Dickey-Fuller (ADF) tests show that in all EAC countries log of real GDP is I(1) and inflation rates are I(0). Thus, before using the log of real GDP in the VAR model, we first-differenced it. A structural VAR was estimated considering that demand shocks do not affect the level of output in the long run, while both demand and supply shocks may affect the price level.

Before using the estimated models to separate demand and supply shocks, we analyzed the quality of the VAR models. First, all VAR models satisfied the stability condition as no root lies outside the unit circle. Second, residuals from VAR models were homoscedastic and were normally distributed, except in the case of Rwanda and Burundi. However, in these two cases, the normality was violated due to excess kurtosis rather than skewness and this is not expected to impact our results much (Gonzalo, 1994).

To analyze the similarity in the shocks between the countries we compared correlation coefficients for the same type of shocks. Supply and demand shocks' correlations are presented in Tables 1a and 1b respectively.

Supply asymmetric shocks pose greater problems for a monetary union than demand shocks. In a monetary union, demand shocks can be expected to become similar as a result of implementation of a common monetary policy while supply shocks cannot because they are not influenced by demand management policies (Bayoumi and Eichengreen, 1994).

Six of the 10 correlation coefficients in supply shocks are positive and statistically significant, indicating a good number of symmetric shocks in EAC countries. In addition, Kenya seems to be a natural anchor for EAC because all pairwise correlations including Kenya are positive and statistically significant. In addition, the correlation between Kenya, Tanzania, and Uganda is bigger than that between Kenya, Rwanda, and Burundi. Other positive and significant correlations are those between Rwanda and other EAC countries except Uganda. However, all these correlation coefficients are low, ranging between 0.217 and 0.405, and far below reported correlations of supply shocks between non-European

Union countries and European countries ranging from 0.468 and 0.6999 for the period 1995 -2001 (Frenkel and Nickel, 2002).

Table 1a: Correlation coefficients of supply shocks

		Burundi	Kenya	Uganda	Tanzania	Rwanda
Kendall's tau_a	Burundi	1.000				
	Kenya	0.241*	1.000			
	Uganda	0.195	0.393**	1.000		
	Tanzania	0.168	0.405**	0.212	1.000	
	Rwanda	0.373**	0.217*	0.171	0.315**	1.000
*. Correlation is significant at the 0.05 level (2-tailed).						
**. Correlation is significant at the 0.01 level (2-tailed).						

Source: Authors' estimations.

Correlation coefficients of demand shocks are very low and not statistically significant and four of 10 are negative. Asymmetric demand shocks are found between Burundi and all other EAC countries except Uganda as well as between Kenya and Rwanda.

Table 1b: Correlation coefficients of demand shocks

		Burundi	Kenya	Uganda	Tanzania	Rwanda
Kendall's tau_b	Burundi	1.000				
	Kenya	-0.022	1.000			
	Uganda	0.166	0.100	1.000		
	Tanzania	-0.010	0.173	0.059	1.000	
	Rwanda	-0.131	-0.117	0.037	0.051	1.000

Source: Authors' estimations.

4.2. Inflation convergence

Table 2 shows that inflation was higher and more volatile in Burundi in the period 2012-19, compared to the rest of the EAC countries. The average inflation in Burundi was 9.2 percent, followed by Kenya (7.9 percent), Uganda (7.1 percent), Tanzania (6.5 percent), and Rwanda (6.0 percent). The standard deviation in Burundi was 8.2, followed by Tanzania (5.2), Rwanda (4.6), Kenya (4.5), and Uganda (3.6).

Table 2: EAC inflation descriptive statistics (full sample)

	Burundi	Kenya	Rwanda	Tanzania	Uganda
	2012-19				
Mean	9.2	7.9	6.0	6.5	7.1

Std. Dev.	8.2	4.5	4.6	5.2	3.6
	2000-2012				
Mean	11.2	8.7	7.4	7.6	7.9
Std. Dev.	8.4	5.2	4.9	6.0	4.1
	2013-2019				
Mean	5.3	6.3	3.2	4.4	5.4
Std. Dev.	6.4	1.6	2.2	1.8	1.7

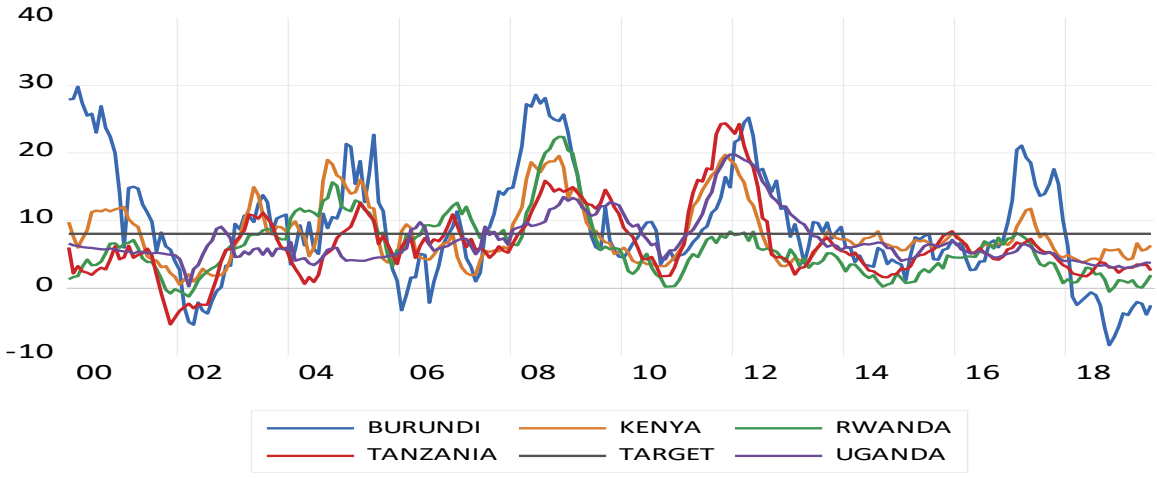
Source: Authors' calculations based on data from EAC's central banks.

Splitting the sample into two sub-samples (before and after the signing of the EAMU protocol in 2013), we observe that inflation was lower and less volatile in the post-EAMU protocol period compared to the pre-EAMU protocol period in all EAC countries. This development reflects the impact of seven years of harmonization of monetary policy frameworks in the region and efforts by EAC's central banks to use more market based monetary policy instruments for controlling the inflation rate.

In the post-EAMU protocol agreement period, inflation was lower in Rwanda with an average of 3.2 percent compared to 7.4 percent in the previous period, followed by Tanzania (4.4 from 7.6 percent), Burundi (5.3 from 11.2 percent), Uganda (5.4 from 7.9 percent), and Kenya (6.3 from 8.7 percent). The volatility reduced more in Tanzania where the standard deviation reduced by 70 percent, followed by Kenya (69.2 percent), Uganda (58.5 percent), Rwanda (55.1 percent), and Burundi (23.8 percent).

Figure 1 shows that inflation remained generally below the target of 8 percent except in Burundi between June and December 2013 as well as between December 2016 and December 2017 due to political and economic problems.

Figure 1: Inflation development in EAC countries



After computing 10 series of pairwise inflation differentials, we used the Bai and Ng (2004) test to assess if these differentials converged. In other words, we tested unit root in X_{it} (i=1,2,…,5).

Table 3 identifies four common factors confirming the use of the panel unit root tests allowing heterogeneity in cross sections. Both ZBN and PBN statistics reject the null hypothesis of a unit root in country specific factors. In addition, MQc and MQf tests show that there are no independent stochastic trends, that is, the unit root underlying the four common factors is identified. We conclude that there is no pervasive divergence among inflation differentials between EAC countries.

Table 3: Bai and Ng (2004) Unit Root tests

Number of common factors	Idiosyncratic shocks		common trends	
r	ZBN	PBN	MQc	MQf
4	9.13*	10.10*	0	0

The convergence of inflation differentials in EAC's countries is also confirmed by Moon and Perron (2004) as well as Chang (2002) tests as shown in Table 4. Thus, the similarity in the results of different tests confirms the robustness of our findings that inflation differentials in EAC countries are converging.

Table 4: Moon and Peron (2004), and Chang (2002) panel unit root tests

Moon and Perron (2004)		Chang (2002)
T_A	T_B	T_{IV}
-7.58	-2.68	-6.65 (0.000)***

In the next step, we estimated the speed of convergence using Equation (14) both in the pre- and post-EAMU protocol periods after rejecting the hypothesis of unit root in all 10 inflation differentials. Tables 5 and 6 show that in all EAC countries inflation is in the process of converging because the coefficient ϕ is statistically significant and less than one in the two sub-samples. However, given the magnitude of ϕ, the speed of convergence is slow. It is important to note that the speed of convergence increased significantly in Rwanda, Kenya, and Tanzania in the post EAMU protocol period compared to the pre-EAMU protocol period. It increased from 5.19 to 15.3 in Rwanda, from 8.49 to 15.9 in Tanzania, and from 9.63 to 10.63 in Kenya. This confirms the assumption that the recent harmonization of monetary policies by EAC's central banks is contributing to accelerating inflation convergence.

Table 5: Estimation of AR(1) coefficients in the pre-monetary union protocol period

	AR (1): $\hat{\phi}$ 2000:2012 Speed of convergence

EAC Panel	0.96 (0.00) 3.63
Burundi	0.91 (0.00) 9.46
Kenya	0.91 (0.00) 9.63
Rwanda	0.95 (0.00) 5.19
Tanzania	0.92 (0.00) 8.49
Uganda	0.95 (0.00) 5.06

Table 6: Estimation of AR(1) coefficients in the post-monetary union protocol period

	AR (1): $\hat{\phi}$ 2013:2019 Speed of convergence
EAC Panel	0.93 (0.00) 7.33
Burundi	0.93 (0.00) 7.49
Kenya	0.90 (0.00) 10.63
Rwanda	0.86 (0.00) 15.30
Tanzania	0.85 (0.00) 15.90
Uganda	0.98 (0.00) 3.22

4. Conclusion and Policy Recommendations

EAC partner states are in the process of implementing the Protocol on the Establishment of the East African Community Monetary Union (EAMU) signed in November 2013. It is expected that a common currency will be in use by 2024.

The main objective of this paper was investigating EAC partner states' readiness for a common currency in 2024. The paper used more recent data compared to other researchers, with the objective of assessing the impact of policy coordination in the region during the last seven years of implementation of the EAMU protocol. This paper's general conclusion is that despite some similarities in the structures of EAC's economies, EAC member states remain susceptible to asymmetric shocks. In addition, our empirical analysis shows that inflation is in the process of converging in EAC, but the speed of convergence is slow, though it increased in some countries in the post-EAMU protocol period compared to the pre-EAMU protocol period. This confirms the assumption that the recent harmonization of monetary policies by EAC's central banks is contributing to accelerating inflation convergence.

Based on our results, there is a need for a longer period of preparation and policy harmonization before the adoption of the common currency. Adopting a common currency in the next four years as initially planned will lead to considerable costs for EAC countries. In addition to policy coordination which has started having a positive impact on the inflation convergence process more efforts are needed to ensure free movement of labor as well as flexibility in EAC labor markets to provide mechanisms for adjustment in a monetary union

with asymmetric shocks. To achieve this objective, there is a need for more political will because international experience shows that focusing more on relative national gains and sovereignty is one of the challenges in the journey towards full regional integration in East Africa.

For example, free movement of workers within EAC, though provided for in the EAC common market protocol, remains constrained by a number obstacles including the fear in some EAC member states that citizens from other countries may take away jobs from local citizens.

The delay in the establishment of regional institutions is another indicator of how more political commitment is needed to support the establishment of EAMU. For example, the East African Monetary Institute (EAMI) was supposed to be established in 2015 to undertake preparatory work for establishing a regional central bank in 2024 including spearheading the harmonization of policies, monitoring and enforcing convergence criteria, and conducting relevant studies. Five years later, EAMI is yet to be established showing that the adoption of a common currency in 2024 is not realistic and can turn out to be very costly for the EAC member states.

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