

Ayeni, Emmanuel; Fanibuyan, Oluwaseyi; Ibrahim, Kayode Muhammed; Mobolaji, Iskil Adewale

Article

Is West Africa single currency a tool for economy transition?

Research in Globalization

Provided in Cooperation with:

Elsevier

Suggested Citation: Ayeni, Emmanuel; Fanibuyan, Oluwaseyi; Ibrahim, Kayode Muhammed; Mobolaji, Iskil Adewale (2023) : Is West Africa single currency a tool for economy transition?, Research in Globalization, ISSN 2590-051X, Elsevier, Amsterdam, Vol. 7, pp. 1-8, <https://doi.org/10.1016/j.resglo.2023.100143>

This Version is available at:

<https://hdl.handle.net/10419/331071>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.



<https://creativecommons.org/licenses/by-nc-nd/4.0/>



Is West Africa single currency a tool for economy transition?

Emmanuel Ayeni^{a,*}, Oluwaseyi Fanibuyan^b, Kayode Muhammed Ibrahim^c, Iskil Adewale Mobolaji^d

^a Bowen University, Iwo, Osun State, Nigeria

^b Birmingham City University, Birmingham, England, United Kingdom

^c Kwara State University Molete, Ilorin, Nigeria

^d University of Ibadan, Nigeria

ARTICLE INFO

Keywords:

Member countries
Economic integration

ABSTRACT

Economy integration among countries of the world is seen as a key to drive economic growth and development through favourable policies among members. The study examines the impact of a single currency on the economy of West Africa States. Findings show that gross domestic product growth rate, degree of openness, and political stability have impacted the single currency competitiveness both among the member countries and globally. However, the possible advantage of a single currency would be annihilated by unfavourable terms of trade, government ineffectiveness, and weak regulatory quality. The study thereby recommended that the single currency in the region would not benefit member countries in the short run but a possibility exists in the long run as a result of the cointegration relationship among variables used in the study.

Introduction

In the quest for regional growth and development, economic integration among regions of the world has taken the lead. Economic integration is used among countries of the world that share the same geographical boundaries majorly for trade liberalization policies to foster both national and regional economies (see [Chang et al., 2009](#); [Bardi and Hfaiedh, 2021](#)).

In 1975, the Economic Community of West Africa States was established to have a single currency in the region (see [Adu et al., 2022](#); [Masson and Pattillo, 2004](#)). This objective was emphasized in Article Section 2 h of the 1975 Treaty of Lagos, which established the community. This treaty specifies that the community must guarantee “harmonization, necessary for the smooth functioning of the community, of the monetary policies of the member nations.” The July 1991 treaty reaffirms this in Article 3 Section 2e as “the construction of an economic union through the adoption of common policies in the economic, financial, social, and cultural sectors, and the creation of a monetary union.” The Treaty of Lagos was ratified by the following 15 member states: Benin, Burkina Faso, Côte d’Ivoire, The Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritius, Niger, Nigeria, Senegal, Sierra Leone, and Togo. With the addition of Cape Verde in 1976 and the departure of Mauritania in 2000, the community now consists of 15

states [Harvey and Cushing \(2015\)](#).

According to [Mundell \(1997\)](#), his studies focused on what was defined as the optimum currency area. He defined optimum currency area as a domain within which exchange rates are fixed. In this area, a single currency may be established under the control of a single central bank that has the authority to issue and redeem money as well as set monetary policy. To address the question of an appropriate domain, [Mundell \(1961\)](#) proposes that the domain be defined as a region where there is both internal and external factor mobility. If factors are mobile across national boundaries, then a flexible exchange system is no longer necessary and may even be negatively harmful.

In 1963, a study by McKinnon also emphasized an optimum currency as one that has a single currency, the same monetary and fiscal policies, and flexible external exchange rates that may be used to fulfill the sometimes conflicting goals of employment, international payments, and price stability. For a single currency to function well, McKinnon highlights the need for price stability within the region and the openness of the economies. [McKinnon \(1963\)](#) also added to Mundell’s view of factor mobility across nations and the significance of factor mobility across industries in selecting an ideal currency area.

[Kenen \(1969\)](#) also focused on factor mobility in his study. He claims that “since regions are defined by their activities, not by their geography or politics, ideal interregional labour mobility demands perfect

* Corresponding author.

E-mail address: emmanuelayeni05@gmail.com (E. Ayeni).

<https://doi.org/10.1016/j.resglo.2023.100143>

Received 2 March 2023; Received in revised form 7 July 2023; Accepted 8 July 2023

Available online 10 July 2023

2590-051X/© 2023 The Author(s). Published by Elsevier Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

occupational mobility and this can only come about when labour is homogeneous". A region's fiscal integration and product variety are both promoted as key factors in determining the best currency region.

According to [Kenen \(1969\)](#), the diversity of a region's product mix may be a more important factor to consider than labour mobility. A well-diversified economy is also more likely to have a well-diversified export sector, which can lessen the impact of external shocks by canceling out positive and negative shocks without changing the exchange rate in response to the shock. Additionally, fiscal integration makes sure that the region's weaker economies are supported as they recover from external shocks.

Empirical shreds of evidence have shown three major requirements of optimum currency areas characteristics. First, the region should experience shocks from common sources and respond symmetrically to those shocks. This indicates that external shocks should cause similar reactions across the region, i.e., the states in the region must react similarly to external shocks for the same monetary and fiscal policies to be able to address shock recovery similarly across the region. Shock symmetry in the region ensures that common monetary policy is feasible for the region because the introduction of a single currency in a region means that the countries that make up the region give up their autonomy over monetary policy. As a result, shock symmetry in the region ensures that the region can respond to external shocks using monetary policy. "Losing financial flexibility has costs and benefits. Also, a nation that abandons its currency loses a tool for containing domestic shocks; but, the nation may also acquire legitimacy and so curb inflation [Alesina et al. \(2002\)](#). He also contends that symmetrical shocks reduce the costs of losing monetary autonomy in that region.

Second, the region's mobility makes sure that shocks to the area dissipate swiftly and uniformly everywhere. When shocks to the region have asymmetric impacts, factors must be easily transferable from surplus member states to deficit member states. This guarantees full employment and regional price stability. Lastly, to transfer resources among the member states, fiscal integration is required throughout the region. In this structure, a common federal institution like the IRS or the US Congress coordinates the fiscal policies of the many states in the region. In this model, federal institutions are responsible for the collection and disbursement of specific taxes, and in the event of an economic slump, weak states can readily be helped by these arrangements.

To address the poor intra-community trade, the leaders think that establishing a regional common currency is a sensible course of action. This is because it will lower the costs involved with utilizing different currencies in trade transactions (see [Cissokho et al., 2012](#); [Sare, 2021](#)). Empirical evidences from studies deliberately targeted to potential trade benefit from a single currency for the Economic Community of West Africa States in the last two decades has generated a lot of discussion and policy debate in recent decades (see [Adu et al., 2019](#); [Bakouf and Ndoeye, 2016](#); [Debrun et al., 2005](#); [Fielding and Shields, 2005](#); [Houssa, 2008](#); [Kenen and Meade, 2008](#); [Tsangarides and Qureshi, 2008](#)).

The primary driving force behind the debate is a growing amount of evidence suggesting that nations who join currency unions could reap large potential benefits (see [Rose, 2000](#); [Glick and Rose, 2002](#); [Frankel and Rose, 2002](#); [Nitsch, 2004](#); [Baldwin et al., 2008](#); [Glick and Rose, 2016](#)). [Rose \(2000\)](#) findings indicated that trade among countries with union currency is thrice that of countries with different currencies, evidenced by Europe. In a similar vein, a currency union promotes greater financial integration and lowers trading costs to enable more vigorous trade [De Grauwe \(2020\)](#). However, recent studies using improvements in the empirical estimation of the gravity equation, such as calculations using high-dimension fixed effects, have produced conflicting results. [Mika and Zymek \(2018\)](#) reveal a lack of strong support for the impact of the euro on trade flows among early and recent adopters of the common currency. [Larch et al. \(2019\)](#) findings show the insignificant of currency unions on trade while [De Sousa \(2012\)](#) concluded that the impact of currency union on trade fade off as a

function of time. Empirical pieces of evidence have shown how currency unions' effects on fostering commerce have changed dramatically throughout time, space, and empirical approach.

Additionally, there is a view that earlier trade liberalization agreements have failed to deliver the economic benefits that policymakers stated would be received by all signatories. As a result, benefits from trade are heterogeneous even under free trade agreements or currency unions since trade elasticities seem to depend on the specific setting, such as the country pairs geographic, cultural, institutional, and development features ([Baier et al., 2019](#)).

The Economic Community of West Africa States is presently divided into two monetary zones. The Francophone countries which are under the West Africa Economic and Monetary Union (WAEMU) have CFA as the single currency while the Anglophone countries in the region have their independent currencies. Results of studies done to examine the impact of a single currency on francophone countries were found to be pro-trade among member countries (see [Anyanwu, 2003](#); [Carrère, 2004](#); [Masson et al., 2005](#); [Nitsch, 2004](#); [Ajayi, 2005](#); [Fielding and Shields, 2005](#); [Masson, 2008](#); [Zannou, 2010](#); [Adam and Chaudhry, 2014](#)).

Few empirical evidence was done for both monetary zone combined (see [Harvey and Cushing, 2015](#); [Masson and Patillo, 2003](#); [Ogunkola 2005](#); [Debrun et al., 2005](#); [Balogun, 2009](#)). The findings of [Harvey and Cushing \(2015\)](#) show that the zone as a whole does not have common sources of shock due to the different economic structures of these countries. Countries in the region respond differently to supply, demand, monetary shocks, and monetary policy.

The finding of [Harvey and Cushing \(2015\)](#) is in line with the primary and secondary criteria to be met by the member state which are; price stability, sustainable government fiscal position, limiting Central Bank financing of government budget deficit, adequate external reserves able to fund at least three months import bills, maintain real exchange stability, positive real exchange rate, and many more. Countries in the region are yet to meet up with the criteria.

The study by [Ogunkola \(2005\)](#) concluded that the region is closer to a monetary union than before against most studies that found the region not to be ready for a single currency. This study examines the impact of a single currency on the region both in the short and long run. A cointegration test was done for long-run relationship while pool regression was done for short-run relationship of single currency among member countries in the region.

Empirical review

The study of a single currency for the West Africa Countries is imperative to make know the fate of the region regarding the policy. In line with this, Euro became a competitive currency to the dollar in terms of international trade, and presently, 40 percent of international trade is dominated by Euro while the remaining 60 percent is dominated by Dollar. Can West Africa Monetary Zone have a similar experience to that of European Countries?

The study of [Okafor, 2013](#); [Harvey and Cushing, 2015](#); [Babalola and Olalowo, 2019](#) focused majorly on the prospect of a single currency in the West Africa Zone. [Okafor et al. \(2015\)](#) examined the cost and benefit of a single currency for the West Africa Economy Zone. The study adopted asymmetric shocks, loss of monetary policy autonomy, and fiscal policy distortion to examine the cost while the benefit was examined through trade creation, financial integration effects, and policy coordination gains. Findings show fiscal policy distortion and loss of monetary policy autonomy are the main cost of monetary union while possible trade creation among member countries was seen as the major gain. The study concluded that the region needs quick macroeconomic adjustment to facilitate the convergence of macroeconomic indicators for a single currency. [Harvey et al. \(2015\)](#) study also focused on the credibility of single currency in the West Africa Single Currency zone. The study adopted Structural Vector Autoregressive Model (SVAR) to examine the linear dependence and underlying structural shocks of the

countries in the zone. Findings show that countries respond asymmetrically to common supply, demand, and monetary shocks. Countries in the region would respond differently to a common monetary policy. He further concluded that monetary union both now and in the future is not encouraged unless the economies of the countries involved converge. Babalola and Olalowo (2019) study focused majorly used 6 criteria for monetary union. The criteria are inflation rate, fiscal deficit, public debt, tax revenue, exchange rate, and external reserve, descriptive statistics was employed in the study to analyze the convergence of the six economic indicators. The study, therefore, concluded that the region is not ready for a single currency zone except for external reserves that converged while other economic indicators failed to converge. He further emphasized that the region's inflation rate is very high and this would weaken the purchasing power of the currency if the single currency is implemented.

The study of Oloyede et al. (2021) focused on the effect of a single currency on trade in the region while a similar study was carried out by Adu et al. (2022) but he focused on Francophone countries only in the region and their findings differ.

Oloyede et al. (2021) the study adopted Pool regression for the study and concluded that there is a positive and insignificant relationship between economic growth and trade openness in the West African region while Adu et al. (2022) examined the impact of the CFA franc on members' bilateral trade flow. The study adopted a structural gravity model with a three-way fixed effect. Findings show that heterogeneous estimates of the CFA franc's impact across different pair in the union: 64 percent are insignificant, 7.3 percent is negatively significant and 29 percent are positively significant. He concluded that the country pair's sizes and geographical continuities determine the ultimate CFA franc trade effect.

Adu et al. (2018) examined real exchange rate responses to shocks in West Africa Monetary Zone. Findings show that countries in the region are structurally different, and asymmetric shocks with inadequate adjustment mechanisms imply that a monetary union would be costly.

The study of Ogunkola (2005), Cham (2016), and Yusuf et al. (2018) findings are different; the study concluded that the region would gain from a single currency in the region. Ogunkola (2005) examines the viability of a single monetary zone in ECOWAS. Findings show that the region is closer to monetary union than before against most studies that found the region not to be ready for a single currency. Cham (2016) examines the relationship between monetary integration, foreign direct investment, and foreign trade among member countries in the region. The findings of the study concluded that foreign direct investment into the West Africa Monetary Zone is influenced positively by monetary integration. The results of the study further strengthen empirical evidence of monetary unions positively influence trade among member countries. Yusuf et al. (2018) focused their study on political constraints hindering the single currency in the West Africa Economy Zone. The study highlighted political constraints but concluded that the benefit associated with a single currency for the region is more than the cost. The study, therefore, examines the impact of a single currency on the West African economy both in the short and long-run using panel cointegration test and pool regression.

In essence, the study of Fontana et al. (2023) and Fankem and Mbesa (2023) shows that the region is not ready for single currency. Their finding is similar to the studies conducted by Okafor, 2013; Harvey and Cushing, 2015; Babalola and Olalowo, 2019. Findings by Fankem and Mbesa (2023) and Fontana et al. (2023) are similar. Fankem and Mbesa (2023) concentrated his study on different Monetary Unions in Africa such as East African Community, Central African Community, West African Community, Southern African Community and Arab Maghreb Union while Fontana et al. (2023) focused majorly on West African Countries. Findings of their study show that monetary community experiences heterogeneous synchronization across time and horizons between the regional economic communities. The study concluded that business cycle synchronization across the regional economic

communities has not yet reached a sufficient level to allow African countries to benefit from a common monetary policy.

The study of Masson (2019) and Amato and Nubukpo (2020) have similar conclusion. The study of Masson (2019) concluded that the requirements for a sustainable monetary union are not adequately captured by the optimum currency area (OCA) and macroeconomic convergence criteria which are given the most attention in plans for African monetary unions.

Also, Amato et al. (2020) believes that suitability of monetary union cannot be judged on the basis of historical data since the structure of these economies is likely to change in the event of economic union "Lucas Critique". Also, inflation rate convergence was insignificant requirement for optimal currency areas since countries involved would lose their monetary autonomy. He further emphasized that the difference in institution characteristics would reflect in the development of monetary policy. The study concluded that single currency in West Africa confirms itself as an appropriate and important project and this would offer countries in the union the opportunity to mutualize their monetary means to pursue their common and special objectives. In this study, the short-term and long-term effects of a single currency in the region are looked at. For the long-term relationship, a cointegration test was done, and for the short-term relationship of a single currency among the countries in the region, pool regression was done.

Data and methodology

The study covers 6 countries in the ECOWAS community which includes Cote d'Ivoire, Gambia, Ghana, Nigeria, Togo, and Sierra Leone. The period for the study is from 1996 to 2021. Between the period of 2003 and 2006, the region implements a disaster risk deduction policy (see ECOWAS, 2006). African Continental Free Trade Area (ACFTA) was proposed in 2015, and signed in 2018. This policy facilitated significant growth in the level of trade in Africa because of the adoption of information and communication technology within the region (see Ejemeyovwi et al., 2020; Oloyede et al., 2021). The period considered in this study will help to show the impact of various policies from time to time on the member state in the region.

The study of Adu et al. (2018) adopted the real exchange rate as a proxy for a single currency in their study while other variables are production, terms of trade, oil prices, trade openness, government expenditure, and real interest rate. This study adopted a real exchange rate (REE) to capture a single currency for the member countries. This will help to consider the purchasing power of each currency rather than the nominal value of their respective domestic currency. Other variables used in the study are gross domestic product growth rate, degree of openness (DOP), terms of trade (TOT) and Worldwide Government Indicators which are measured as Government Effectiveness (GOF), Political Stability (POS), and Regulatory Quality (ROQ). Yusuf et al. (2018) concluded that political constraint is a major factor hindering single currency implementation leading to shifting implementation dates repeatedly in the past. This study adopted Worldwide Government indicators which comprise six dimensions of governance to examine the role of government and politics in single currency implementation in the region. All data are from World Development Indicators and Worldwide Government Indicators.

The following are the steps that our study takes. Unit root test is used for stationary of the data. Thereafter, the panel co-integration test and Pool Regression are done to check for long-run and short-run relationships respectively. Finally, impulse response analysis to examine real exchange rate response to shocks among ECOWAS countries.

Unit root test

In this section, the time properties of the variable used in this study are tested with panel unit root tests such as the Augmented Dickey-Fuller(ADF) (Dickey and Fuller, 1981); Phillip Perron (PP) (Phillips

and Perron, 1988). The decision rule is that if the absolute p-value of the LLC test, IPS test, ADF test, or of PP test is <5 percent critical value, then it is adjudged that the tested variable is stationary or does not have unit roots. If found otherwise that the absolute p-value of the ADF test or that of the PP test is greater than 5 percent critical value, then it is adjudged that the tested variable is non-stationary or has unit roots.

Panel cointegration test

Before the panel error cointegration model (PECM) is estimated, it is necessary to first establish the presence of cointegration among the variable of interest. As a result, the panel Engle and Granger-based cointegration test proposed by Pedroni (2004) and Johansen (1995) panel cointegration test were conducted. There is a possible long-run relationship between real exchange rates and economic performance. In the cointegration analysis, both Pedroni (2004) and Johansen Fisher (1995) panel cointegration tests are conducted for sensitivity and robustness checks. The Pedroni (2004) panel cointegration model can be expressed with the variables as:

$$fRER_{it} = \alpha_i + \beta_1 GDP_{it} + \beta_2 DOP_{it} + \beta_3 TOT_{it} + \beta_4 POS_{it} + \beta_5 GOF_{it} + \beta_7 ROQ_{it}$$

Where α_i is the unobservable individual country-specific effect, $t = 1, \dots, T$ and $i = 1, \dots, N$, t is the number of observations over time, i is cross-sectional units and η_{it} represents error term. Pedroni (2004) proposed the computation of the test statistics by taking the first difference of Eq. (4) and performing cointegration on its residual. The error term is modeled in the first autoregressive process as:

$$\eta_{it} = \Phi_i \eta_{it-1} + \mu_{it} \quad (5)$$

The null hypothesis of no cointegration is tested for all the statistics. Choosing the appropriate lag length is crucial for panel cointegration results. The Johansen Fisher (1995) panel cointegration model, on the other hand, has the form of a vector autoregression (VAR) of order written as:

$$y_{it} = \alpha_i + A_1 y_{it-1} + \dots + A_p y_{it-p} + v_{it} \quad (6)$$

Where y_{it} is a vector of $NT \times 1$ variables integrated of order 1 i.e. I (1), in this study, $RER_{it} = (fGDP_{it}, fDOP_{it}, fINF_{it}, fLFDI_{it}, fGOS_{it}, fGOF_{it}, fPOS_{it})$ is the error term. The cointegration and the short-run terms can be expressed in Eq. (6) as:

$$\Delta y_{it} = \alpha_i + \prod y_{it-1} + \sum_{j=1}^p \Delta y_{it-j} + v_{it} \quad (7)$$

The null hypothesis of no cointegration implies that $p(\prod) = 0$ and the presence of cointegration if otherwise.

Pool regression

In the study, panel OLS estimation methods were employed. The use of panel data regression is supported by the fundamental argument that the data to be utilized is subject to cross-sectional and temporal features, allowing for the analysis of firm innovation and performance across time as well as across the sampled quoted companies. Since panel regression

Table 1
Summary statistics.

Variables	Descriptive statistics			
	Mean	Std. dev.	Skewness	Kurtosis
RER	105.5768	30.36762	2.531015	11.58635
GDP	4.302150	4.824970	-0.187525	10.00166
DOP	62.71286	21.55458	0.270548	2.21306
TOT	91.04347	12.53148	0.294315	2.521306
POS	-0.607035	0.8333337	-0.431209	2.273507
GOF	-0.832291	0.458165	0.932541	0.252889
ROQ	-0.677893	0.341536	0.252889	2.789706

Table 2
Unit Root Test.

Variables	At Level	PP	First Difference	
	ADF		ADF	PP
RER	39.8464*** (0.0001)	75.7889*** (0.0000)	.....	.....
GDP	36.6852*** (0.0003)	53.7239*** (0.0000)	.....	.....
DOP	12.8364 (0.3810)	14.9286 (0.2454)	60.5579*** (0.0000)	124.920*** (0.0000)
TOT	48.0629*** (0.0000)	35.9680*** (0.0007)	.....	.....
POS	48.0629*** (0.0000)	35.9680*** (0.0002)	.....	.....
GOF	21.1657** (0.0480)	27.3863*** (0.0068)	.....	.....
ROQ	13.3175 (0.3464)	28.0613*** (0.0054)	62.6272*** (0.0000)	.....

Significance at 1%, 5%, and 10% critical levels is represented by ***, **, and *, respectively.

increases sample size and decreases the degree of freedom problem, it yields superior results and eliminates the issues with multicollinearity, etc (Greene, 2003). The error structure is simply $u_{it} = e_{it}$ where the e_{it} are independently and identically distributed with zero mean and variance σ_e^2 .

$$RER_{it} = \beta_0 + \beta_{1it} GDP + \beta_{2it} DOP + \beta_{3it} TOT + \beta_{4it} POS + \beta_{5it} GOF + \beta_{6it} ROR + u_{it} \quad (8)$$

Discussion of results

Preliminary results

The result in the Table 1 shows the descriptive statistics for the study. The real exchange rate adopted in this study has a mean of 105.5768 indicating that there is a downward trend of countries in the region's competitiveness in the period. The standard deviation is 30.36762 which indicated that the real exchange rate is unstable over the period. The gross domestic product growth rate, degree of openness, and terms of trade have a mean of 4.302150, 62.71286, and 91.04347 respectively while only the gross domestic product growth rate is relatively stable compared to the degree of openness and terms of trade. Government effectiveness was captured by political stability, government effectiveness, and regulatory quality with mean of -0.607035, -0.832291, and -0.677893 indicating political instability, government ineffectiveness, and poor regulatory equality among member countries. The standard deviations are all stable indicating a long-time inefficiency of the government in the region.

Table 2 shows the unit root results of the variables adopted for this study. RER, GDP, TOT, POS, and GOF are all stationary at the level. Then, the null hypothesis is accepted, while DOP is stationary at the first level. For variable ROQ, there is a rancor between the ADF and PP tests. The PP suggests that the variable is stable at levels while the ADP test suggests that the variable is stable at first different. The study adopted the PP test because it is robust to serial correlation.

Pedroni panel co-integration test is carried out to examine the presence of co-integration among sampled countries within and between the groups. The result in Table 3 shows only test statistics calculated within the group. The alternative hypothesis of presence cointegration is

Table 3
Pedroni Panel Co-integration Test.

	t-statistics	p-value
ADF	-1.94	0.03
PP	-4.46	0.00

ADF = Augment Dicky Fuller, PP = Phillips-Peron.

Table 4
Johansen Fisher Panel Cointegration Results.

Coint. Rank	Trace Test	Prob.	Max Eigen Test	Prob.
None	184.8	0.0000	94.55	0.0000
At Almost 1	94.27	0.0000	46.62	0.0000
At Almost 2	57.13	0.0000	35.76	0.0004
At Almost 3	30.23	0.0026	17.02	0.0062

Table 5
Breusch-Pagan LM Test for Random Effect.

	Var	S
LOG(RER)	0.71	0.85
E	0.13	0.36
U	0.22	0.47
Test: Var(u) = 0 chibar2 = 12.34 Prob(chibar2) = 0.1453		

Table 6
Panel Regression.

Var	Pool	RE
	LOG(RER)	LOG(RER)
GDP	0.10** (0.03) [3.87]	-0.003 (0.01) [-0.36]
DOP	0.04** (0.003) [13.65]	-0.008 (0.001) [-0.58]
TOT	-3.20** (1.05) [-3.04]	-1.24 (2.81) [-0.44]
Control Variables		
POS	0.57** (0.16) [3.68]	0.13 (0.04) [3.15]
GOF	-1.29** (0.36) [-3.54]	-0.14 (0.10) [-1.40]
ROQ	-2.18** (0.40) [-5.45]	-0.20 (0.12) [-1.70]
Constant	99.46** (19.97) [4.98]	4.58** (0.13) [35.52]
OBS	96	96
R ²	0.73	0.11
Adj R ²	0.67	0.05
F-stat	2.31	1.79
AIC	1.02	0.11

Note: Panel I = Pool OLS, Panel II = Random Effect, *p < 0.1, **p < 0.05, ***p < 0.01, parenthesis are (standard error), [t-statistics].

accepted indicated by the panel ADF-statistics and PP-statistics at 5 percent and 1 percent significant level respectively. This shows the presence of cointegration between the real exchange rate and dependent variables (gross domestic product growth rate, degree of openness, terms of trade, political stability, regulatory quality, and government effectiveness).

To further establish cointegration relationships between our variables, Johansen Fisher Panel cointegration was done. Both the Trace Test and Max Eigen Test show the presence of cointegration among the variables. The alternative hypothesis is accepted at 1 percent indicating there is a presence of cointegration among the variables (Table 4).

The paper conducted a panel regression to overcome the heterogeneity problem that could result in endogeneity which often leads to biased results. Table 5 is the results of the Breusch-Pagan multiplier (LM) test to check for random effects in the panel model. Therefore, the test checks for the existence of heteroskedasticity at the individual level. Findings from the Breusch-Pagan LM test show that the error terms are

not individual specific which suggests that random effect is not suitable. Hence, we employed the pool OLS model to explain the relationship between real exchange rate (RER), gross domestic product (GDP), degree of openness (DOP), terms of trade (TOT), political stability (POS), government effectiveness (GOF) and regulatory agency quality (ROQ).

From the panel results presented in Table 6, the gross domestic product growth rate positively and significantly impacts the real exchange rate (RER). A percent rise in the gross domestic product leads to a 10% rise in the real exchange rate. This indicated that a rise in real exchange rate implies that the region would increase its competitive advantage among members of West African countries. This indicated that a single currency among West African countries would lead to a rise in the value of the single currency in the world just like the Euro. As both the economy and value of the single currency rise, it leads to a rise in the competitiveness of the currency for trade in the region and the world at large.

Also, the elasticity of the degree of openness significantly improves the real exchange rate at 4 percent, such that a percent increase in the degree of openness would lead to a 4 percent rise in the real exchange rate. The result suggests that trade liberalization without any form of barriers among West African countries improves the real exchange rate for trading. The rise in trade among member countries would lead to a rise in the value and competitiveness of the single currency. Countries in the region would gain from trade liberalizations thereby expanding the economy of member countries.

Also, the coefficient of terms of trade significantly impacts the real exchange rate at 320 percent. This means that a one percent increase in terms of trade among member countries would lead to a rapid fall in real exchange rates. In other words, a one percent increase in terms of trade among the countries may worsen the real exchange rate by 320 percent. The decline in terms of trade implies that the price of exports falls relative to imports. Imports become more expensive and the single currency of member countries would lose its competitiveness both among the member country and globally.

Considering the effect of political stability in the panel model, government effectiveness, and regulatory agency quality on the real exchange rate, the results show that the three control variables affect the real exchange rate. The result shows that political stability has a positive and significant impact on the real exchange rate of member countries. The region would benefit from political stability indicating that a stable political system among West African countries significantly favours single currency among member countries. But government effectiveness and regulatory agency quality have negative and significant impact on the real exchange rate. Government effectiveness and regulatory agency quality have adverse effects on the real exchange rate at 129 percent and 218 percent respectively. Government effectiveness and regulatory agency of the government in the region would negatively affect the comparative advantages of a single currency in the region due to poor system of governance, abuse of the rule of law, and regulatory agency inefficiency (see Yusuf et al., 2018).

The study's findings differ from the results of Adu et al. (2019) who indicated that productivity and terms of trade have no significant impact on real exchange rate among West African member countries and concluded that monetary union would be costly now while in this study, the gross domestic product growth rate was found to have significant and a positive impact on single currency and terms of trade was found to worsen the competitiveness of the single currency by huge quantum. This implies that the whole gain from a single currency would be annihilated by unfavourable terms of trade.

The findings of Oloyede et al. (2021) indicated that the economic growth rate and degree of openness have a positive and insignificant impact on single currency in the region. The study emphasizes government and relevant stakeholders to ensure policy enhancement and enforcement to transmit the experienced economic growth into substantial trade gain. In this study, gross domestic product growth rate and degree of openness were found to have a positive and significant impact

Table 7
Diagnostic Test.

Normality test	
Jarque-Bera	12.68**
Cross-section Dependency test	
Pesaran CD	234.45

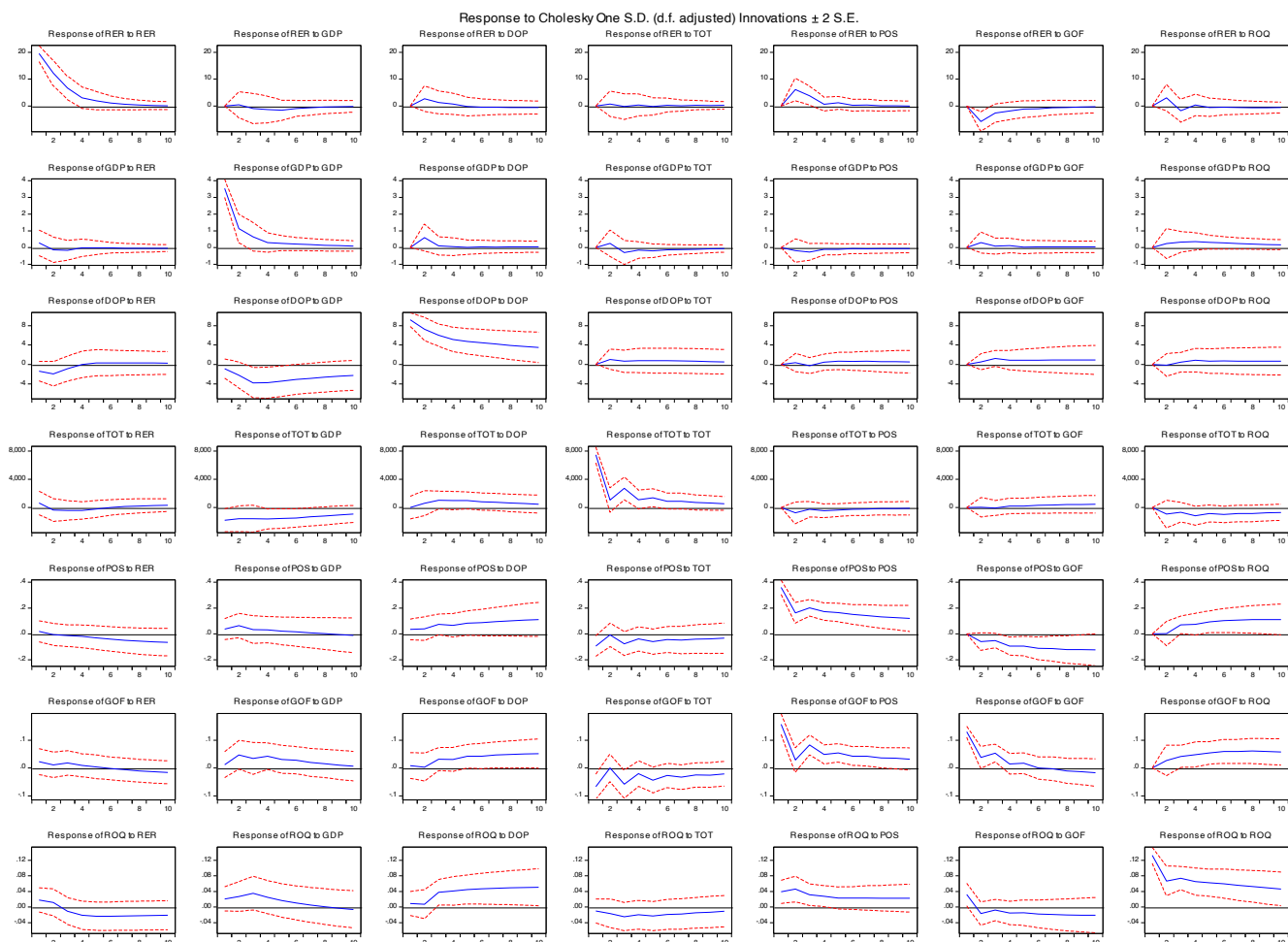
on the real exchange rate. This implies that there is potential benefit from a single currency through economic growth and trade liberalization policy. The findings of this study are in line with (see Yusuf et al., 2018; Oloyede et al., 2021) on government effectiveness, political stability, and regulatory quality. Oloyede et al. (2021) emphasize the weakness of the government and relevant stakeholders' lackadaisical approach to the enforcement of adequate policies. The study findings also found that government ineffectiveness and weak regulatory quality would harm the competitiveness of the single currency among member countries.

In Table 7, the robustness of the estimated model was also checked using the normality test and cross-dependence test. The result of the Jarque-Bera stat suggests the residual of the model is normality distributed at a 5 percent level. Furthermore, we corrected for cross-sectional dependency in the individual disturbance term and the result Breusch Pagan LM suggests no correctional dependency after correcting through the Generalized Least Method (GLM) and this is necessary because of some unobserved common factors common to all the countries may affect the residuals. The result suggests that there is no cross-dependency in the model estimated.

The graph above represents the impulse response function of the study. It can be found that real exchange rate shock response is relatively stable in the long-run among while there is instability in the short run.

Conclusion

The study was carried out to examine the impact of a single currency on the economies of West African countries. The study results indicated that gross domestic product growth rate, degree of openness, and political stability have impacted the single currency competitiveness both among the member countries and globally but the possible advantage from the single currency would be annihilated by unfavourable terms of trade, government ineffectiveness, and weak regulatory quality. Government ineffectiveness and weak regulatory quality could account for the failure of member countries to meet up with both the primary and secondary criteria. The study thereby recommended that the single currency in the region would not benefit member countries in the short run but a possibility exists in the long run as a result of the cointegration relationship among variables used in the study. However, the paper was limited to short run and long run relationships where short run estimates were provided. Future research may extend the scope and provide long run estimates to explain the relationship between a unified currency, trade variables, political variables, government and regulatory variables among others. In addition, future research may also consider the dynamic relationship of using a single currency as a tool for economy transition instead of short run and long run term.



CRedit authorship contribution statement

Emmanuel Ayeni: Conceptualization, Methodology, Software, Validation, Formal analysis, Investigation, Data curation, Writing – original draft, Writing – review & editing, Visualization, Project administration. **Oluwaseyi Fanibuyan:** Writing – original draft, Writing – review & editing, Supervision. **Kayode Muhammed Ibrahim:** Writing – original draft, Writing – review & editing. **Iskil Adewale**

Appendix

List of countries used in the study

Cote d' Ivoire
GAMBIA
GHANA
SIERRA-LEONE
TOGO
NIGERIA

References

- Adam, A. M., & Chaudhry, I. S. (2014). The currency union effect on intra-regional trade in Economic Community of West African States (ECOWAS). *Journal of International Trade Law and Policy*.
- Adu, R., Litsios, I., & Baimbridge, M. (2019). Real exchange rate and asymmetric shocks in the West African Monetary Zone (WAMZ). *Journal of International Financial Markets, Institutions and Money*, 59, 232–249.
- Adu, R., Litsios, I., & Baimbridge, M. (2022). ECOWAS single currency: Prospective effects on trade. *Journal of International Money and Finance*, 126, Article 102651.
- Ajayi, K. (2005). Regional financial and economic integration in West Africa. *Department of Economics, Stanford University, Stanford, CA*, 94309.
- Alesina, A., Barro, R. J., & Teneyro, S. (2002). Optimal currency areas. *NBER macroeconomics annual*, 17, 301–345.
- Amato, M., & Nubukpo, K. (2020). “A new currency for West African states: The theoretical and political conditions of its feasibility”, PSL. *Quarterly Review*, 73(292), 3–26.
- Anyanwu, J. C. (2003). Estimating the macroeconomic effects of monetary unions: The case of trade and output. *African Development Review*, 15(2–3), 126–145.
- Babalola, A., & Olalowo, E. B. (2019). Empirical analysis of the prospect for single currency in West African sub-region. *Academic Journal of Economic Studies*.
- Baier, S. L., Yotov, Y. V., & Zylkin, T. (2019). On the widely differing effects of free trade agreements: Lessons from twenty years of trade integration. *Journal of International Economics*, 116, 206–226.
- Bakoup, F., & Ndoeye, D. (2016). Why and when to introduce a single currency in ECOWAS. *Africa Economic Brief*, 7(1), 1–16.
- Baldwin, R. E., Di Nino, V., Fontagné, L., De Santis, R. A., & Taglioni, D. (2008). Study on the impact of the euro on trade and foreign direct investment. *European Economic and Monetary Union Working Paper*, 321.
- Balogun, E. D. (2009). Inflation differential in the West African Monetary Zone (WAMZ) area: Implications for unionization.
- Bardi, W., & Hfaiedh, M. A. (2021). International trade and economic growth: Evidence from a panel ARDL-PMG approach. *International Economics and Economic Policy*, 18(4), 847–868.
- Carrère, C. (2004). African regional agreements: Impact on trade with or without currency unions. *Journal of African Economies*, 13(2), 199–239.
- Cham, T. (2016). Does monetary integration lead to an increase in FDI flows? An empirical investigation from the West African Monetary Zone (WAMZ). *Borsa Istanbul Review*, 16(1), 9–20.
- Chang, T. H., Huang, C. M., & Lee, M. C. (2009). Threshold effect of the economic growth rate on the renewable energy development from a change in energy price: Evidence from OECD countries. *Energy Policy*, 37(12), 5796–5802.
- Cissokho, L., Houghton, J., Makpayo, K., & Seck, A. (2012). Why is agricultural trade within ECOWAS so high? *Journal of African Economies*, 22(1), 22–51.
- De Grauwe, P. (2020). *Economics of the monetary union*. USA: Oxford University Press.
- De Sousa, J. (2012). The currency union effect on trade is decreasing over time. *Economics Letters*, 117(3), 917–920.
- Debrun, X., Masson, P., & Pattillo, C. (2005). Monetary union in West Africa: Who might gain, who might lose, and why? *Canadian Journal of Economics/Revue canadienne d'économie*, 38(2), 454–481.
- Fankem, G. S. G., & Mbese, L. C. F. (2023). Business Cycle Synchronization and African Monetary Union: A Wavelet Analysis. *Journal of Macroeconomics*.
- Fielding, D., & Shields, K. (2005). The impact of monetary union on macroeconomic integration: Evidence from West Africa. *Economica*, 72(288), 683–704.
- Fontana, F., Sheriff, M., & Kamara, H. (2023). Towards monetary Union in the Economic Community of West African States (ECOWAS): Better Policy Harmonisation and Greater Intra-Trade are Needed. *Journal of Policy Modeling*.
- Glick, R., & Rose, A. K. (2016). Currency unions and trade: A post-EMU reassessment. *European Economic Review*, 87, 78–91.
- Harvey, S. K., & Cushing, M. J. (2015). Is West African Monetary Zone (WAMZ) a common currency area? *Review of Development Finance*, 5(1), 53–63.
- Houssa, R. (2008). Monetary union in West Africa and asymmetric shocks: A dynamic structural factor model approach. *Journal of Development Economics*, 85(1–2), 319–347.
- Kenen, P. B. (1969). The international position of the dollar in a changing world. *International Organization*, 23(3), 705–718.
- Larch, M., Wanner, J., Yotov, Y. V., & Zylkin, T. (2019). Currency unions and trade: A PPML re-assessment with high-dimensional fixed effects. *Oxford Bulletin of Economics and Statistics*, 81(3), 487–510.
- Masson, P. R., & Pattillo, C. (2004). *The monetary geography of Africa*. Brookings Institution Press.
- McKinnon, R. I. (1963). Optimum currency areas. *The American Economic Review*, 53(4), 717–725.
- Mika, A., & Zymek, R. (2018). Friends without benefits? New EMU members and the “euro effect” on trade. *Journal of International Money and Finance*, 83, 75–92.
- Mundell, R. A. (1961). A theory of optimum currency areas. *The American Economic Review*, 51(4), 657–665.
- Mundell, R. A. (1997). Optimum currency areas. *presentación en la Universidad de Tel-Aviv*, 5.
- Nitsch, V. (2004). Have a break, have a... national currency: when do monetary unions fall apart? *National Currency: When Do Monetary Unions Fall Apart*.
- Ogunkola, O. (2005). An evaluation of the viability of a single monetary zone in ECOWAS.
- Okafor, H. O. (2013). Estimating the costs and benefits of a common currency for the Second West African Monetary Zone (WAMZ). *Journal of Economics and Behavioral Studies*, 5(2), 57–68.
- Oloyede, B. M., Osabuohien, E. S., & Ejemeyovwi, J. O. (2021). Trade openness and economic growth in Africa's regional economic communities: Empirical evidence from ECOWAS and SADC. *Heliyon*, 7(5), e06996.
- Pedroni, P. (2004). Panel cointegration: Asymptotic and finite sample properties of pooled time series tests with an application to the PPP hypothesis. *Econometric Theory*, 20(3), 597–625.
- Rose, A. K. (2000). One money, one market: The effect of common currencies on trade. *Economic Policy*, 15(30), 08–45.
- Tsangarides, C. G., & Qureshi, M. S. (2008). Monetary union membership in West Africa: A cluster analysis. *World Development*, 36(7), 1261–1279.
- Yusuf, A. S., Ahmad, A. A., & Wali, M. M. (2018). ECOWAS Single Currency and the Political Constraints. *International Journal of Academic Research in Business and Social Sciences*, 8(9), 537–546.
- Zannou, A. (2010). Determinants of intra-ECOWAS trade flows. *African Journal of Business Management*, 4(5), 678.
- Sare, Y. A. (2021). Threshold Effects of Financial Sector Development on International Trade in Africa. *Int. J. Finance & Econ.*, 26(1), 515–541.
- Kenen, P. B., & Meade, E. E. (2008). *Regional monetary integration*. Cambridge: Cambridge University Press.

Mobolaji: Writing – original draft, Writing – review & editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

- Glick, R., & Rose, A. K. (2002). Does a currency union affect trade? *The time-series evidence. Eur. Econ. Rev.*, 46(6), 1125–1151.
- Frankel, J., & Rose, A. (2002). An estimate of the effect of common currencies on trade and income. *Q. J. Econ.*, 117(2), 437–466.
- Masson, P. R. (2008). Currency unions in Africa: is the trade effect substantial enough to justify their formation? *The World Economy*, 31(4), 533–547.
- Masson, P., & Patillo, C. (2003). Monetary union in West Africa: an agency of restraint for fiscal policies? *J. Afr. Econ.*, 11(3), 387–412.
- HUMANITARIAN AFFAIRS DEPARTMENT (DHA)(2006). ECOWAS POLICY FOR DISASTER RISK REDUCTION. https://www.preventionweb.net/files/26398_4037ecowaspolicydrr1.pdf.
- Ejemeyovwi, J., Osabuohien, E., & Bowale, E. (2020). ICT adoption, innovation and financial development in a digital world: empirical analysis from Africa. *Transnational Corporations Review*.
- Dickey, D. A., & Fuller, W. A. (1981). Likelihood Ratio Statistics for Autoregressive Time Series with a Unit Root". *Econometrica*, 49, 1057–1072.
- Phillips, P. C. B., & Perron, P. (1988). Testing for a Unit Root in Time Series Regression. *Biometrika*, 75, 335–346.
- Greene, W. H. (2003). *Econometric Analysis* (5th ed.). Upper Saddle River, New Jersey: Prentice Hall.