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ECOWAS Common Currency, a Mirage or Possibility?

Summary: Unlike previous studies, the current study uses oil price and inflationary shocks to assess the feasibility of actualizing the ECOWAS Vision 2020, which is aimed at creating a monetary union. With the help of the Blanchard and Quah (BQ) decomposition for a sample from 1975:05 to 2018:08, two sets of models are estimated: models for inflationary shocks and models for oil price shocks. It is found that although the vision is a mirage, the creation of a common currency can serve as a shock absorber against the negative spillovers of global and regional inflationary shocks. The study also finds that oil price shocks lead to appreciation of the currency for the oil exporting country Nigeria, while Nigeria, the Gambia and Ghana stand out in their responses to oil price shocks. The study recommends that these countries cannot be part of the Vision and that more coordination among ECOWAS members is needed before this Vision can be actualised.

Keywords: Monetary Union, Optimal currency area, ECOWAS, WAEMU, SVAR, BQ decomposition.

JEL: C13, E31, E52, E58, F33, F42.

After the establishment of the European Monetary Union (EMU), which led to the creation of the euro as the single currency, several groups of countries have attempted to follow suit. One of these groups of countries is the Economic Community of West African States (ECOWAS), which was established by the Treaty of Lagos signed on 28th May, 1975. In order to form a monetary union, the ECOWAS adopted a resolution in June 2007, which introduced ECOWAS Vision 2020. Additionally, the ECOWAS adopted convergence criteria in 2001, similar to the Maastricht Treaty of the EMU (Economic Community of West African States - ECOWAS 2017).

This paper attempts to empirically establish whether the ECOWAS's Vision 2020 is a mirage or possibility based on the Optimum Currency Areas (OCA) theory developed by Robert A. Mundell (1961), Ronald I. McKinnon (1963) and Peter Kenen (1969), in the light of inflationary and oil price shocks. To achieve this, the study attempts to answer the following research questions: (i) Do members of the ECOWAS meet the primary and secondary convergence criteria?; (ii) Are the shocks in ECOWAS countries symmetric?; (iii) Is the members' source of shocks regional?; (iv) Are the responses of ECOWAS countries to a given shock similar?

This paper contributes to the current debate about ECOWAS's plan to create a single currency as follows. Unlike other studies, we focus on inflationary and oil price shocks. We look at the dynamics of domestic inflation in relation to global and regional inflation. Additionally, we examine the dynamics of REER in the light of oil price and

productivity shocks. Moreover, we split the dynamics of these shocks into four periods: (i) pre-WAEMU; (ii) post-WAEMU; (iii) pre-WAMZ; and (iv) post-WAMZ. We also combine impulse response, variance decomposition and correlation analyses to examine these shocks.

The major findings of this paper include the following. The domestic shocks of the WAEMU members have higher correlation than those of the WAMZ members. Responses to shocks are not similar across the ECOWAS members. The formation of WAEMU tends to reduce the impact of global inflationary shocks on the members.

1. Overview of ECOWAS

The organization currently comprises fifteen (15) member countries. They include Benin (BEN), Burkina Faso (BFA), Cote d'Ivoire (CIV), Guinea Bissau (GNB), Mali (MLI), Niger (NER), Senegal (SEN), Togo (TGO), the Gambia (GMB), Ghana (GHA), Guinea (GUI), Nigeria (NGA), Sierra Leone (SLE), Cabo Verde (CPV) and Liberia (LBR). The West African Economic and Monetary Union (WAEMU) is made up of the first eight members, while the last two are not part of any monetary union. The remaining members comprise the West African Monetary Zone (WAMZ). The WAEMU and WAMZ were established in 1994 and 2000, respectively. Only three Member States, namely Guinea, Liberia and Nigeria, met the first of the primary criteria (deficit-GDP ratio less than 3 per cent) as opposed to six in 2015, which were Benin (6.2%), the Gambia (9.5%), Ghana (10.9%) Niger (6.1%), Sierra Leone (6.4%) and Togo (8.5%). In terms of the second of the primary criteria (annual average inflation less than 10 per cent), only Ghana, Nigeria, and Sierra Leone recorded an inflation rate of more than ten percent (10%) in 2016. In 2015, all ECOWAS members other than Ghana recorded an inflation rate of less than 10%. The Anglophone countries recorded higher inflation rates. The higher inflation rates could be attributed to the depreciation of the currencies of these members in 2015 and 2016. The target of the third primary criterion (gross external reserves greater than 3 months of imports) was previously six months of imports, but was reduced to three months of imports in 2015. In 2016, only the Gambia (2.4 months), Ghana (2.8 months) and Guinea (1.4 months) did not meet this criterion. Nigeria (6.5 months) and Cabo Verde (6.4 months) had the largest coverage of imports in both 2015 and 2016 (ECOWAS 2017).

Only Cabo Verde (128.6%), the Gambia (117.3%) and Togo (79.4%) have not met the first of the secondary criteria (debt-GDP ratio lower than 70 per cent). Guinea, Nigeria, the Gambia and Sierra Leone did not meet the second of the secondary criteria (Central bank financing of deficit above 10 per cent of the previous year's tax revenue). Regarding the third secondary criterion (variation of nominal exchange rate within the band of ±10 per cent), compared to two in 2015, three currencies, experienced an average variation outside the ±10% band in 2016. The affected currencies were the Guinean franc (16.4%), Nigerian Naira (23.5%) and Sierra Leonean leone (19.1%), as reported by (ECOWAS 2017).

2. Literature Review

The preconditions of forming an MU guided by the OCA include the existence of symmetry of shocks across all the members (Mundell 1961), open economies (Kenen 1969) as well as well-diversified economies (McKinnon 1963). Krishna Regmi, Alex Nikolsko-Rzhevskyy, and Robert Thornton (2015) and Raymond Adu, Ioannis Litsios, and Mark Baimbridge (2019) highlighted the common empirical methodologies for operationalizing the OCA. Terence D. Agbeyegbe (2008) and Dubravko Mihaljek (2018), for example, assessed the *convergence criteria* of the MU candidates, whereas Regmi, Nikolsko-Rzhevskyy, and Thornton (2015) and Simplice A. Asongu, Oludele E. Folarin, and Nicholas Biekpe (2019) assessed the nature of the symmetry of macroeconomic shocks by analysing the correlation of macroeconomic variables of the potential MU members (see for example, Antonella Cavallo and Antonio Ribba 2015; Irfan Civcir and Dizem Ertac-Varoglu 2019).

Employing fractional integration and cointegration as econometric methodology, Paul Alagidede, Simeon Coleman, and Juan Carlos Cuestas (2012) found evidence of significant heterogeneity in the behaviour of inflation among the WAMZ countries. They suggested that policy coordination among the central banks of the members should be enhanced before signing the treaty for a single currency. Adu, Litsios, and Baimbridge (2019) examined the REER responses to shocks in exchange rate determinants in WAMZ using annual data ranging from 1980 to 2015. They found an asymmetric response of REER to shocks across the WAMZ countries, while the relative contribution of the shocks to REER movement was different across the countries. In contrast to other studies, Xavier Debrun, Paul Masson, and Catherine Pattillo (2005) developed and calibrated a model in which the incentive to join the MU was provided by the negative spillover from the independent monetary policy. They identified the lack of fiscal convergence as the main hindrance to actualizing an MU in West Africa. Their findings contradicted the conclusions of other studies, which identified asymmetric shocks or a low level of regional trade as the main constraints preventing the establishment of the MU. Correlation analysis was employed by David Fielding, Kevin Lee, and Kalvinder Shields (2004) to determine whether monetary integration among the members of (CFZ) led to the improvement of macroeconomic integration. Romain Houssa (2008) examined the asymmetric shocks of monetary union in West Africa. After employing a dynamic factor model, the study found that correlations of demand shocks were more similar among the Francophone countries of the region. After applying both soft and hard clustering algorithms on some variables, selected based on OCA and convergence criteria, Charalambos G. Tsangarides and Mahvash S. Qureshi (2008) examined the suitability of an MU among WAMZ as well as ECOWAS countries. The outcomes of their cluster analysis showed significant dissimilarities among the MU candidates, especially the WAMZ countries. They further revealed that it would be costly for Ghana and Nigeria to be in the WAMZ because they are "singletons". Carsten Hefeker (2010) examined the interactions among fiscal policy, structural reform, and monetary union. His conclusions revealed that a symmetric monetary policy may play a role in influencing fiscal authorities to adopt a distortionary fiscal policy, which subsequently reduces their structural reform efforts. He further argued that an asymmetric monetary union causes further polarization among

the member countries. Chuku Chuku (2012) examined the feasibility of creating a common currency in West Africa using structural VAR analysis. The results of the study indicated that symmetry in the responses of economies to external shocks is high and that correlations of their demand, supply and monetary shocks are asymmetric. Adu, Litsios, and Baimbridge (2019) investigated the behaviour of the real exchange rate in the light of asymmetric shocks in the West African Monetary Zone (WAMZ). The study also confirmed the existence of the asymmetric response of the real exchange rate to a given shock. Anders Ögren (2019) and Antje Wiener, Tanja A. Börzel, and Thomas Risse (2019) provided a historical and theoretical account of monetary arrangement around the world, whereas Mohd H. Kunroo (2015) and Nauro F. Campos, Jarko Fidrmuc, and Iikka Korhonen (2019) explored the most recent literature on the OCA. Asongu, Jacinta Nwachukwu, and Vanessa Tchamyou (2017) provided a detailed review of recent studies on proposed African monetary unions.

In the light of the foregoing literature review, it can be argued that no study has employed the OCA in conjunction with the BQ decomposition to analyse the mirage (possibility) of forming an MU among the ECOWAS members. The studies that have utilized this methodology have mostly focused on Asian countries (see Grace H. Y. Lee and Mohamed Azali 2012; Paul De Grauwe 2016; Shafighi Najla and Behrooz Gharleghi 2016; Jong-Wha Lee and Warwick J. McKibbin 2019) and European countries (see Alison Johnston and Aidan Regan 2016; Giancarlo Corsetti et al. 2019; Salim Dehmej and Leonardo Gambacorta 2019) or Latin American countries (Luis F. Vegh and Carlos A. Morano 2017; Kurt A. Hafner and Lennart Kampe 2018). Assessment of the ECOWAS in the light of oil price and inflationary shocks through employing BQ decomposition can provide further insight into the mirage or possibility of the ECOWAS members forming a fully-fledged MU. The OCA explains how the shocks should behave, while the BQ decomposition is helpful in splitting the shocks into temporary and permanent. Thus, the BQ decomposition can be used to model a combination of I(1) and I(0) variables (Chuku 2012; Walter Enders 2015; Sagiru Mati, Civcir, and Hüseyin Özdeşer 2019; Yohanna Panshak, Civcir, and Özdeşer 2019).

3. Data and Methodology

The monthly series of Consumer Price Index (CPI), which is used to calculate the inflation rate, was obtained from the International Financial Statistics (IFS) database (International Monetary Fund 2019)[1]. Annual percentage change in CPI measures the inflation level, algebraically $\pi_t^i = (lnX_t - lnX_{t-12}) \times 100$. The CPI (2010 = 100) monthly series from May 1975 to August, 2018 is employed for the analysis. The choice of sample period reflects the date on which the Treaty of Lagos was signed.

Global Inflation (GI) and Regional Inflation (RI) are calculated from the weighted averages of Global CPI and Regional CPI respectively. Specifically, $w_i = \frac{\overline{X}_t}{\sum_1^n \overline{X}_t}$, $r_t = \sum_1^n w_{it} X_{it}$, $g_t = \sum_1^n w_{it} X_{it}$, where w_i, r_t and g_t stand for the individual weight, regional CPI, and global CPI, respectively. X_t is the CPI, $\overline{X}_t$ is the mean of the

[1] **International Monetary Fund.** 2019. International Financial Statistics. https://data.imf.org/?sk=4c514d48-b6ba-49ed-8ab9-52b0c1a0179b (accessed August 15, 2019).

CPI, and n is the number of countries considered in the calculation of regional or global CPI. The United States of America (USA), United Kingdom (UK), France and China are taken as global economies, because these economies exert influence on the ECOWAS countries. Some studies consider the USA to represent the global economy (see for example Regmi, Nikolsko-Rzhevskyy, and Thornton 2015). Due to a lack of CPI data for some ECOWAS countries over the full sample, only eight are considered in this study. These countries include Nigeria (NGA), the Gambia (GMB), Ghana (GHA), Cote d'Ivoire (CIV), Burkina Faso (BFA), Niger (NER), Senegal (SEN) and Togo (TGO). The CPI values for Togo are missing over the period of 1995:01 and 1995:07. However, we use the forecasted values from an ARIMA(2,1,2) model to create the missing values as it is important to include Togo as part of the analysis because it is one of the original founders of ECOWAS. The first three countries are members of the WAMZ, and the rest are members of the WAEMU. For the data analysis and estimation, this study uses long-run restrictions to identify the structural global shocks (GS), regional shocks (RS) and domestic shocks (DS). This form of identification is based on the decomposition of Olivier J. Blanchard and Danny Quah (1989), which was also adopted by Regmi, Nikolsko-Rzhevskyy, and Thornton (2015) and Adu, Litsios, and Baimbridge (2019). Specifically, the model involves the estimation of the following equation:

$$\begin{bmatrix} 1 & \xi_{12} & \xi_{13} \\ \xi_{21} & 1 & \xi_{23} \\ \xi_{31} & \xi_{32} & \xi_{33} \end{bmatrix} \begin{bmatrix} \pi_t^g \\ \pi_t^r \\ \pi^{reer} \end{bmatrix} = \begin{bmatrix} \lambda_{11}(L) & \lambda_{12}(L) & \lambda_{13}(L) \\ \lambda_{21}(L) & \lambda_{22}(L) & \lambda_{23}(L) \\ \lambda_{31}(L) & \lambda_{32}(L) & \lambda_{33}(L) \end{bmatrix} \begin{bmatrix} \pi_{t-1}^g \\ \pi_{t-1}^r \\ \pi_{t-1}^g \end{bmatrix} + \begin{bmatrix} \gamma_{11} & 0 & 0 \\ 0 & \gamma_{22} & 0 \\ 0 & 0 & \gamma_{33} \end{bmatrix} \begin{bmatrix} d_{1t} \\ d_{2t} \\ d_{3t} \end{bmatrix} + \begin{bmatrix} \varepsilon_{1t} \\ \varepsilon_{2t} \\ \varepsilon_{3t} \end{bmatrix}. \tag{1}$$

Equation (1) can be represented compactly as:

$$\Xi X_t = \Lambda(L) X_{t-1} + \Gamma D_t + \varepsilon_t, \tag{2}$$

where Ξ represents the matrix of coefficients of the endogenous variables, Λ is the matrix of coefficients of the lagged endogenous variables, and Γ is the matrix of coefficients of the dummy variables.

Or, in reduced form:

$$X_t = \Psi X_{t-1} + \varphi D_t + e_t, \tag{3}$$

where $\Psi = \Xi^{-1}\Lambda(L)$, $\varphi = \Xi^{-1}\Lambda\Gamma$ and $e_t = \Xi^{-1}\varepsilon_t$.

Equation (2) is a stationary VAR with vector X_t containing the variables, specifically global inflation (GI) π^g, regional inflation (RI) π^r, and domestic inflation (DI) π^d. The set of dummy variables is represented by D_t, which captures the break dates for GI, RI and DI. The Greek letters Ξ and Λ are $\mathbb{R}^{n\times n}$ matrices of parameters. Similarly, ε_t is a vector containing the inflationary shocks, GS, RS and DS. Equation (2) provides a compact representation of Equation (1) and Equation (3) is the reduced form VAR.

Using the Wold representation, the vector moving average of Equation (1) can be represented as follows (Enders 2015; Mati, Civcir, and Özdeşer 2019).

$$\pi_t^g = \sum_{q=0}^{\infty} \lambda_{11}(q)\varepsilon_{t-q}^g + \sum_{q=0}^{\infty} \lambda_{12}(q)\varepsilon_{t-q}^r + \sum_{q=0}^{\infty} \lambda_{13}(q)\varepsilon_{t-q}^d; \quad (4)$$

$$\pi_t^r = \sum_{q=0}^{\infty} \lambda_{21}(q)\varepsilon_{t-q}^g + \sum_{q=0}^{\infty} \lambda_{22}(q)\varepsilon_{t-q}^r + \sum_{q=0}^{\infty} \lambda_{23}(q)\varepsilon_{t-q}^d; \quad (5)$$

$$\pi_t^d = \sum_{q=0}^{\infty} \lambda_{31}(q)\varepsilon_{t-q}^g + \sum_{q=0}^{\infty} \lambda_{32}(q)\varepsilon_{t-q}^r + \sum_{q=0}^{\infty} \lambda_{33}(q)\varepsilon_{t-q}^d. \quad (6)$$

Or compactly as:

$$\begin{bmatrix} \pi_t^g \\ \pi_t^r \\ \pi_t^d \end{bmatrix} = \begin{bmatrix} \Omega_{11} & 0 & 0 \\ \Omega_{21} & \Omega_{22} & 0 \\ \Omega_{31} & \Omega_{32} & \Omega_{33} \end{bmatrix} \times \begin{bmatrix} \varepsilon_t^g \\ \varepsilon_t^r \\ \varepsilon_t^d \end{bmatrix}, \quad (7)$$

where $\Omega_{ij} = \Lambda_{ij}(L)$ is a lag operator polynomial; therefore, Equation (7) can be represented compactly as:

$$X_t = \Omega(L)\varepsilon_t. \quad (8)$$

For Equations (7) and (8) to be valid, the endogenous variables have to be stationary, while the structural shocks should have unit variance and be uncorrelated (Enders 2015; M. Hashem Pesaran 2015; Klaus Neusser 2016). The restrictions needed for identifying this system of equations involve the following small country assumptions: (i) Domestic economies are small open economies and domestic inflation has no contemporaneous and lagged effects on global inflation; (ii) Idiosyncratic shocks of domestic economies have zero long-run effects on both regional and global economies; (iii) Regional shocks have no long-run impact on the global economy. These assumptions are the same as in Regmi, Nikolsko-Rzhevskyy, and Thornton (2015) and Adu, Litsios, and Baimbridge (2019). Given these small country assumptions, Equation (1) is restricted such that $\lambda_{13}(L) = 0$, so that domestic inflation does not have either contemporaneous or lagged effects on global inflation. Three restrictions need to be imposed in order to identify Equation (1). For the identified VAR system, the number of restrictions (r) is given by $r = \frac{n^2-n}{2}$, where n is the number of variables in the system. Given 3 variables, the required number of restrictions is 3. Hence, a long-run restriction such that $\Omega_{12} = \Omega_{13} = \Omega_{23} = 0$ in Equation (7) is required to recover the shocks.

We also include other sets of models in order to analyse oil price shocks on REER, with a sample similar to M2, M3, M5 and M6. Due to the unavailability of oil price data, the sample of M2 begins from January 1980. Again, a three-variable VAR is also estimated, with oil price (o_t), productivity (p_t) and REER (r_t). All three variables are expressed in annual logarithmic change. As in Adu, Litsios, and Baimbridge (2019), it is assumed that country-specific shocks do not have a long-run effect on the oil price (Adu, Litsios, and Baimbridge 2019) and that demand-specific shocks do not have a long-run effect on supply (Blanchard and Quah 1989). In short, REER and productivity do not affect the oil price in the long-run, while REER does not affect productivity in the long-run. Thus, we have the following form of restrictions as shown in Equation (9):

$$\begin{bmatrix} o_t \\ p_t \\ r_t \end{bmatrix} = \begin{bmatrix} \Omega_{11} & 0 & 0 \\ \Omega_{21} & \Omega_{22} & 0 \\ \Omega_{31} & \Omega_{32} & \Omega_{33} \end{bmatrix} \times \begin{bmatrix} \varepsilon_t^o \\ \varepsilon_t^p \\ \varepsilon_t^r \end{bmatrix}, \quad (9)$$

where o_t is real oil price, generated by converting the oil price to domestic currency and then deflating it by domestic CPI, p_t is the productivity, measured by real GDP converted to monthly series by "quadratic match-average" and indexed to 2010, as employed by Dimitrios Asteriou, Kaan Masatci, and Keith Pılbeam (2016). We follow Adu, Litsios, and Baimbridge (2019) to construct the trade-weighted REER (r_t).

4. Empirical Results

For the full sample of 1975:05 to 2018:08, all the inflation variables (GI, RI and DI) appear to be I(0) except for global inflation, Nigerian inflation and Gambian inflation, based on formal unit root tests developed by David A. Dickey and Wayne A. Fuller (1979) and Peter C. B. Phillips and Pierre Perron (1988). However, when structural breaks are taken into account, these integrated inflation variables become stationary. The structural breaks occur at various dates, so a dummy variable is generated to capture each break date for each inflation variable; 1 is assigned for the specific break date and 0 otherwise. The structural break date for global inflation is 1981:11, while the dates for the Gambia and Nigeria are 1987:01 and 1996:07, respectively. Formally $D_{it} = 1$ for $t = i$ and $D_{it} = 0$ for $t \neq i$, where i is the break date. For the sake of comparison, four sub-samples are considered; two samples capture the period before and after establishment of the WAEMU and the other two samples cover the period before and after the creation of the WAMZ. A new definition of global CPI, which includes China, is also used for the samples after the creation of the WAEMU and WAMZ because China has become a major global player in recent years. For the sake of parsimony, the Schwarz Information Criteria (SIC) is used to determine the optimal lags for the VAR. The VAR with two lags is estimated for all the countries in the form of Equation (3). The lag selection is also guided by the number of lags necessary to make the VAR stable and whiten its error. All the VAR models meet the diagnostic requirements of homoscedasticity, non-autocorrelation and stability. The diagnostic results are not reported in order to save space. The models used in this study are defined in Table 1.

Table 1 Sample, Model and Definition of Global Variable

Model name	Sample	Definition of global CPI
M1	1975 to 2018a	Weighted averages of CPI's of US, UK, and France used as a global CPI
M2	1975 to 1993b	Definition of global CPI same as M1
M3	1994 to 2018c	Definition of global CPI same as M1
M4	1994 to 2018c	Weighted averages of CPI's of US, UK, France and China used as a global CPI
M5	1975 to 1999d	Definition of global CPI same as M1
M6	2000 to 2018e	Definition of global CPI same as M1
M7	2000 to 2018e	Definition global CPI same as M4

Notes: a, b, c, d, and e stand for full sample, period before WAEMU, period after WAEMU, period before WAMZ and period after WAMZ, respectively. Due to the lack of oil price series, M2 and M5 samples start from January 1980, M5 and M6 samples end in December 2018 for the models of oil price shocks.

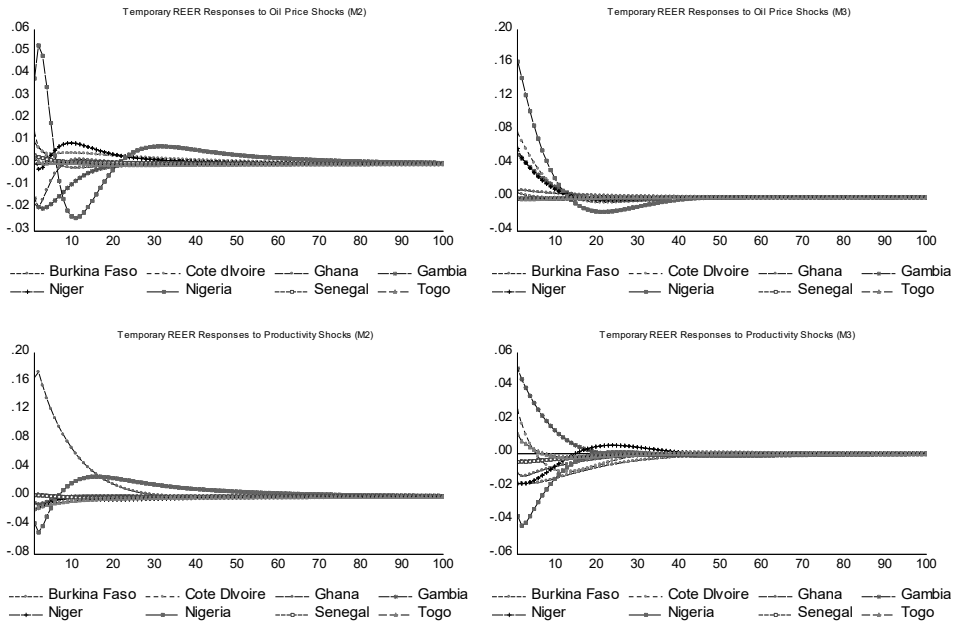
Source: Authors' compilation.

To save space, only comparisons of models 2 and 3 as well as models 5 and 6 are reported. We also determine that the inclusion of China as part of the global variable does not make any significant difference.

4.1 The Impulse Response of REER

The purpose of this section is to observe how REER responds to both productivity and oil price changes similar to Regmi, Nikolsko-Rzhevskyy, and Thornton (2015) and Adu, Litsios, and Baimbridge (2019). If the members of a monetary union respond to a given shock in a similar way, then a common monetary policy could be used to address the consequence of the shocks; otherwise, each member country has to use its own monetary policy to address the shock. In essence, if the members' responses to a given shock are similar, then monetary unification is beneficial; otherwise, it is costly.

In order to gain an insight into the responses of REER to productivity and oil price shocks, the impulse responses of M2 are compared with those of M3. Figure 1 reports the impulse responses of M2 and M3, while Figure 2 contains the impulse responses of M5 and M6. The top part of these figures represents the responses of REER to oil price shocks, while the responses of REER to productivity shocks are depicted at the bottom of these figures. For simplicity of reference, M2-O implies the sub-figure of the M2 model showing the response of REER to oil price shocks, and M3-P signifies the sub-figure of the M3 model showing the response of REER to productivity shocks.

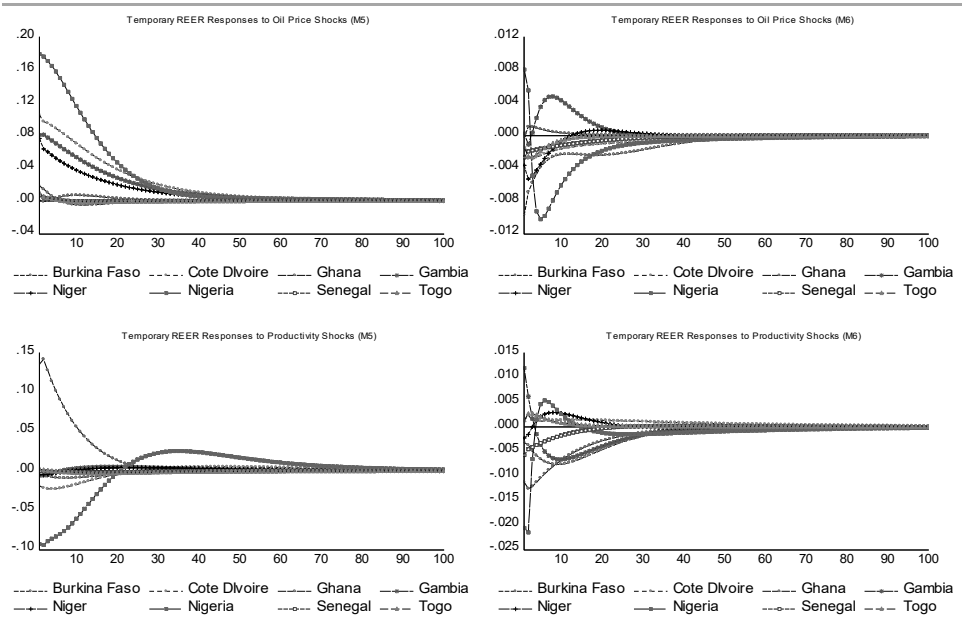


Source: Authors' estimations.

Figure 1 Response of REER to Oil Price and Productivity Shocks (M2 and M3)

The first task is to compare the impulse responses of the models before the establishment of the WAEMU (M2) and WAMZ (M5) with the corresponding models representing the period after their establishment. To this end, M2 is compared with M3, while M5 is compared with M6. Before the establishment of the WAEMU, M2-O shows that the responses of REER to oil shocks of Nigeria, Ghana and the Gambia are different from the responses of the rest of the countries. On the other hand, M3-O shows that Nigeria, Cote D'Ivoire and the Gambia have different paths of response to oil price shocks after creation of the WAEMU. As indicated by M2-P, Ghana and Nigeria have unique paths of impulse responses before the establishment of the WAEMU. As shown by M3-P, the paths of the REER responses to productivity shocks are similar after the creation of the WAEMU except for Nigeria, the Gambia, Cote D'Ivoire and Togo. In both cases, Nigeria, Ghana and the Gambia have different paths of impulse response from the rest of the countries.

Figure 2 compares M5 and M6 in order to determine the dynamics of the REER responses before and after the establishment of the WAMZ. Based on the impulse responses, the period after the creation of the WAMZ the paths of REER responses to oil price shocks are similar except for Nigeria, the Gambia, Niger and Cote D'Ivoire as shown by M5-O. However, M6-O shows that only Ghana, the Gambia and Nigeria stand out after the creation of the WAMZ. On the other hand, the paths of REER responses to productivity shocks are also similar before the WAMZ except for Nigeria and Ghana, as indicated by M5-P. In addition to Nigeria and Ghana, M6-P shows that the responses of REER to productivity shocks for Burkina Faso and the Gambia also stand out after the WAMZ.



Source: Authors' estimations.

Figure 2 Response of REER to Oil Price and Productivity Shocks (M5 and M6)

4.2 Variance Decomposition of REER

The idea is that a country should join an MU if the regional shocks dominate, opt for an autonomous monetary policy if the shocks are idiosyncratic, or peg its currency against the global currency if the forecast error variance is dominated by the global shocks (Regmi, Nikolsko-Rzhevskyy, and Thornton 2015). In this section, we consider the shocks coming from REER as domestic because they are demand-related shocks, and shocks originating from oil price as global shocks, similar to Adu, Litsios, and Baimbridge (2019).

Tables 2 and 3 report the 2-month-ahead and 24-month-ahead variance forecast error of the REER models. A comparison of M2 and M3 is presented in Table 2, while M5 and M6 are compared in Table 3. Again, for easy reference, M2-2H denotes the 2-month horizon variance decomposition of model M2, while M3-24H represents the 24-month horizon variance decomposition of model M3 and so on.

The M2-2H of Table 2 shows that all the countries except Ghana had some significant magnitudes of shocks coming from REER before the creation of the WAEMU. However, the situation changed after the creation of the WAEMU as only Nigeria and Niger were dominated by oil shocks in the short horizon. Again, in the longer 24-month horizon, only Ghana was not dominated by the REER shocks before the WAEMU. After the WAEMU, all the countries were dominated by REER shocks, although Nigeria and Niger still recorded some large oil shocks of 30.10 and 37.16, respectively. The implication is that ECOWAS countries should not peg their currencies against the global currency.

Table 2 Variance Decomposition of REER, M2 and M3

Country	2-month horizon M(2)			2-month horizon (M3)			24-month horizon (M2)			24-month horizon (M3)		
	OIL	PROD	REER	OIL	PROD	REER	OIL	PROD	REER	OIL	PROD	REER
Burkina	6.87	0.50	92.63	0.91	12.85	86.24	6.00	1.20	92.80	1.04	33.09	65.86
Cote	20.64	1.18	78.18	44.17	4.19	51.64	16.83	2.64	80.53	28.41	3.20	68.40
Ghana	0.91	75.59	23.50	5.48	11.86	82.66	0.59	83.60	15.81	5.54	14.05	80.42
Gambia	7.05	2.33	90.62	30.48	29.16	40.35	13.55	2.03	84.42	21.75	20.97	57.29
Niger	0.39	17.71	81.90	52.34	5.88	41.78	9.23	12.20	78.57	37.16	7.57	55.27
Nigeria	12.28	11.06	76.66	55.77	3.87	40.37	7.65	9.34	83.01	30.10	3.35	66.55
Senegal	9.59	2.96	87.45	1.19	9.49	89.32	6.63	3.83	89.53	3.31	18.12	78.57
Togo	0.20	13.10	86.70	0.83	32.89	66.29	0.13	16.74	83.13	2.69	24.31	73.00

Source: Authors' estimations.

To make a comparison between the period before and after the creation of the WAMZ, Table 3 reports the variance decomposition of M5 and M6. According to M6-2H and M6-24H, Cote D'Ivoire, the Gambia, Niger and Nigeria were dominated by oil price shocks before and after the creation of the WAMZ, as their magnitudes of oil shocks were 94.16, 82.21, 75.14 and 76.05 (2-month horizon) and 78.69, 72.81, 69.12 and 50.94 (24-month horizon), respectively. All the countries were dominated by the REER shocks after the creation of the WAMZ in both the short and long horizon as presented by M6-2H and M6-24H of Table 3.

Table 3 Variance Decomposition of REER, M5 and M6

Country	2-month horizon M(5)			2-month horizon (M6)			24-month horizon (M5)			24-month horizon (M6)		
	OIL	PROD	REER	OIL	PROD	REER	OIL	PROD	REER	OIL	PROD	REER
Burkina	7.47	1.03	91.50	13.52	2.29	84.20	5.59	6.60	87.81	9.29	24.38	66.32
Cote	94.16	3.86	1.98	2.83	1.41	95.76	78.69	4.10	17.21	11.69	6.73	81.58
Ghana	0.00	73.93	26.07	0.04	10.15	89.80	0.34	80.82	18.85	0.05	12.48	87.46
Gambia	82.21	0.42	17.38	0.01	2.18	97.81	72.81	0.45	26.74	1.56	5.84	92.59
Niger	75.14	0.32	24.54	2.75	0.49	96.76	69.12	0.40	30.48	6.68	5.08	88.24
Nigeria	76.05	21.07	2.88	1.05	9.71	89.24	50.94	13.03	36.03	7.54	10.54	81.92
Senegal	9.27	0.02	90.71	7.43	36.16	56.41	4.50	3.13	92.37	7.63	27.48	64.88
Togo	3.81	0.26	95.93	2.22	2.24	95.54	2.21	1.47	96.33	4.44	5.13	90.44

Source: Authors' estimations.

4.3 Correlation of REER Shocks

This section employs correlation to determine the symmetry or otherwise of the inflationary shocks. The residuals from the SVAR for each country are taken to be the shocks, namely REER shocks, productivity shocks and oil price shocks. If the correlation is zero, negative or small, then the shocks are asymmetric, but if they are strongly positive, then they are said to be symmetric (Regmi, Nikolsko-Rzhevskyy, and Thornton 2015; Adu, Litsios, and Baimbridge 2019). The correlation estimates of productivity shocks and oil price shocks are not reported as it is observed that they are all strongly positive. Table 4 reports the correlation estimates of models M2 and M3. According to Panel A, the correlation between Senegal and Burkina Faso is weakly positive before the establishment of the WAEMU, but this figure drastically increases from 0.30 to 0.82 after the creation of the WAEMU as shown in Panel B. Panel A also shows that Ghana and Togo cannot have the same monetary policy to address their REER shocks as the correlation between them is strongly negative (-0.44). Other strong positive correlations are recorded between Nigeria and Cote D'Ivoire, Nigeria and Niger, Niger and the Gambia, Cote D'Ivoire and Burkina Faso, Cote D'Ivoire and the Gambia, Cote D'Ivoire and Niger, Burkina Faso and Niger, and Burkina Faso and Senegal. The higher correlation is due to the creation of a common currency among the countries except for Nigeria, the Gambia and Ghana. The correlation of REER shocks for Nigeria is positive with some countries because of inter-regional trade. It is obvious that the number of positive correlation estimates increased after the creation of the WAEMU.

Table 5 reports the correlation estimates of M5 and M6 in order to compare the period before and after the creation of the WAMZ. It is clear that the creation of the WAMZ did not improve the symmetry of shocks across the ECOWAS countries as the number of strongly positive correlation estimates for model has dropped, as shown by Panel B of the table.

Table 4 Correlation of REER Shocks: M2 and M3

Panel A: Correlation of REER shocks (M2)

Country	BFA	CIV	GHA	GMB	NER	NGA	SEN	TGO
BFA	1.00							
CIV	0.27	1.00						
GHA	-0.06	-0.05	1.00					
GMB	0.01	-0.13	0.14	1.00				
NER	0.16	0.24	0.01	-0.02	1.00			
NGA	-0.04	0.06	0.01	0.01	-0.53	1.00		
SEN	0.30	0.29	-0.01	0.06	0.14	0.05	1.00	
TGO	-0.19	0.15	-0.44	-0.11	0.16	0.00	0.20	1.00

Panel B: Correlation of REER shocks (M3)

Country	BFA	CIV	GHA	GMB	NER	NGA	SEN	TGO
BFA	1.00							
CIV	0.44	1.00						
GHA	0.12	0.11	1.00					
GMB	-0.03	0.68	0.20	1.00				
NER	0.66	0.79	0.11	0.34	1.00			
NGA	0.12	0.88	0.18	0.85	0.53	1.00		
SEN	0.82	0.24	0.09	-0.26	0.48	-0.11	1.00	
TGO	0.08	0.00	-0.34	-0.09	0.13	-0.05	0.13	1.00

Source: Authors' estimations.

Table 5 Correlation of REER Shocks: M5 and M6

Panel A: Correlation of REER shocks (M5)

Country	BFA	CIV	GHA	GMB	NER	NGA	SEN	TGO
BFA	1.00							
CIV	0.33	1.00						
GHA	0.10	0.02	1.00					
GMB	0.12	0.91	0.01	1.00				
NER	0.56	0.87	0.12	0.73	1.00			
NGA	0.17	0.94	0.02	0.93	0.75	1.00		
SEN	0.79	0.33	0.10	0.14	0.53	0.22	1.00	
TGO	0.05	0.08	-0.38	-0.01	0.17	0.04	0.28	1.00

Panel B: Correlation of REER shocks (M6)

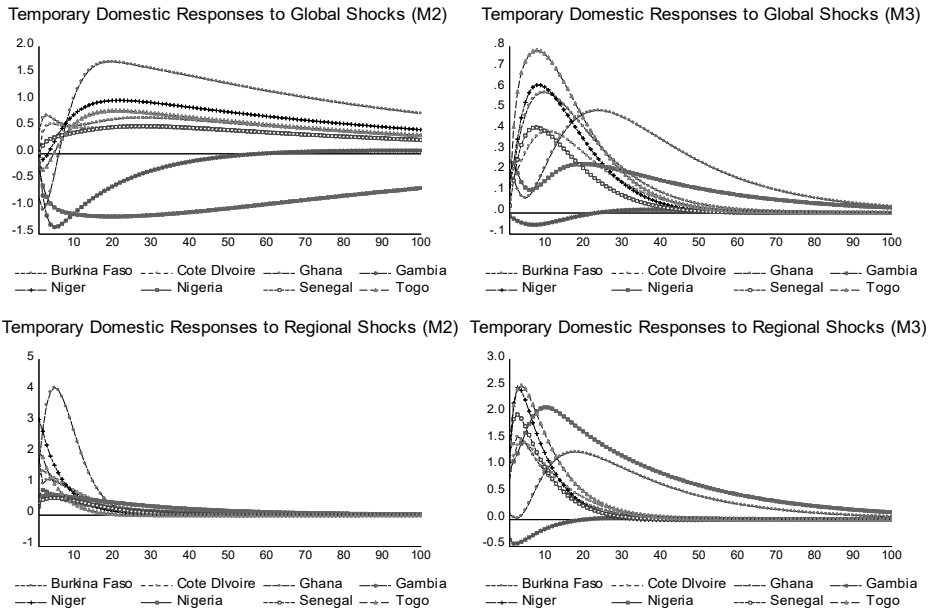
Country	BFA	CIV	GHA	GMB	NER	NGA	SEN	TGO
BFA	1.00							
CIV	0.16	1.00						
GHA	0.09	-0.00	1.00					
GMB	-0.14	-0.09	0.25	1.00				
NER	0.34	0.66	-0.06	0.13	1.00			
NGA	-0.01	-0.03	0.26	0.38	-0.06	1.00		
SEN	0.73	0.15	0.09	-0.10	0.33	0.01	1.00	
TGO	0.20	0.28	-0.49	-0.19	0.34	-0.13	0.31	1.00

Source: Authors' estimations.

4.4 The Impulse Response of Domestic Inflation

In order to gain an insight into the responses of domestic economies to the regional and global shocks, the impulse responses of M2 are compared with those of M3. Figure 3 reports the impulse responses of M2 and M3, while Figure 4 contains the impulse responses of M5 and M6. The top part of these figures represents the responses of domestic economies to global shocks, while the responses of domestic economies to regional shocks are depicted at the bottom of these figures.

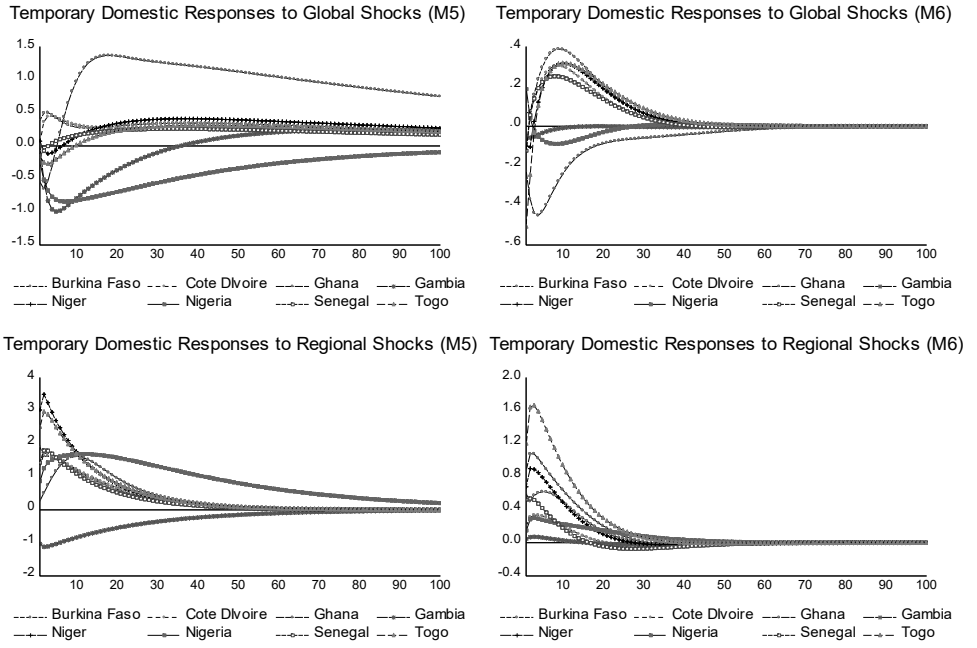
Before the establishment of the WAEMU, M2-G shows that the response of Ghana to global shocks could be as high as 1.72 and the response of the Gambia to global shocks could be as low as -1.38. On the other hand, M3-G shows that the highest response to global shocks after the creation of the WAEMU of 0.78 was recorded by Togo and the lowest value of -0.06 was recorded by the Gambia, indicating a fall in the magnitude of the responses by 55 per cent and 96 per cent, respectively. Additionally, M2-G and M3-G indicate that the shocks disappear at a shorter horizon in the latter model compared to the former. As indicated by M2-R and M3-R, the level of responses to regional shocks are lower after WAEMU creation, but the shocks die out faster before the establishment of the WAEMU. Moreover, the paths of the responses to global shocks are similar except for Nigeria, Ghana and the Gambia for both M2-G and M3-G, and the paths of responses to regional shocks are also similar except for Ghana in M2 and Ghana, Nigeria and the Gambia in M3-R. Again, Nigeria, Ghana and the Gambia stand out as their paths of responses differ from the rest as in the case of the REER responses.



Source: Authors' estimations.

Figure 3 Response of Domestic Economies to Regional and Global Inflationary Shocks (M2 and M3)

Figure 4 compares M5 and M6 in order to determine the dynamics of the responses before and after the establishment of the WAMZ. Based on the impulse responses, the period after the creation of the WAMZ has not only shown lower responses of domestic economies to both the global and regional inflationary shocks, but also faster disappearance of both the shocks. Additionally, the paths of the responses to global shocks are similar except for Ghana, Nigeria and the Gambia for both M5 and M6, and the paths of responses to regional shocks are also similar except for Nigeria and the Gambia in M5-R. However, after the creation of the WAMZ, only Togo stands out as its response to regional inflationary shocks was the highest at the outset. This implies that most ECOWAS countries had similar response paths after WAMZ.



Source: Authors' estimations.

Figure 4 Response of Domestic Economies to Regional and Global Inflationary Shocks (M5 and M6)

4.5 Variance Decomposition of Inflation

Tables 6 and 7 report the 2-month-ahead and 24-month-ahead variance forecast error of the inflation models. A comparison of M2 and M3 is presented in Table 6, while M5 and M6 are compared in Table 7. The comparison of M2 and M3 in Table 6 provides a greater insight. The M2-2H of the table shows that only Cote D'Ivoire, Niger and Togo had some significant magnitudes of RS before the creation of the WAEMU. Their RS magnitudes were 31.07, 67.05 and 50.78 (2-month horizon) and 44.77, 55.92 and 40.47 (24-month horizon), respectively. However, the scenario changed after the creation of the WAEMU as only the non-WAEMU Anglophone countries were not RS-dominated. The RS for Ghana, the Gambia and Nigeria after WAEMU creation

are 0.24, 13.86 and 26.26 (2-month horizon) and 26.36, 9.68 and 81.59 (24-month horizon), respectively. The implication is that most members became suitable for the common currency after the creation of the common currency.

Table 6 Variance Decomposition of Inflation, M2 and M3

Country	2-month horizon M(2)			2-month horizon (M3)			24-month horizon (M2)			24-month horizon (M3)		
	GS	RS	DS	GS	GS	RS	DS	GS	GS	RS	DS	GS
BFA	1.93	13.40	84.67	1.39	75.56	23.04	11.97	23.67	64.36	17.96	73.51	8.54
CIV	1.43	31.07	67.50	1.39	66.47	32.14	13.71	44.77	41.52	8.49	77.89	13.62
GHA	2.86	16.39	80.75	1.24	0.24	98.52	6.17	24.45	69.38	2.93	26.36	70.70
GMB	4.85	7.89	87.26	0.04	13.86	86.10	21.62	4.79	73.59	0.25	9.68	90.07
NER	0.05	67.05	32.90	1.24	76.24	22.52	18.38	55.92	25.71	10.19	83.76	6.04
NGA	2.07	2.14	95.80	1.53	26.26	72.22	13.15	3.32	83.53	0.97	81.59	17.44
SEN	0.25	4.07	95.68	0.39	85.99	13.62	10.68	12.38	76.94	6.30	81.84	11.87
TGO	0.85	50.78	48.37	0.87	32.97	66.16	19.92	40.47	39.60	9.29	59.92	30.79

Source: Authors' estimations.

To make a comparison between the period before and after the creation of the WAMZ, Table 7 reports the variance decomposition of M5 and M6. According to M6-2H and M6-24H, Ghana, the Gambia and Nigeria were still not RS-dominated even after the creation of the WAMZ, as their RS magnitudes are 45.70, 0.49 and 1.71 (2-month horizon) and 26.94, 0.30 and 5.78 (24-month horizon), respectively. This means that Anglophone countries are not ready for the common currency.

Table 7 Variance Decomposition of Inflation, M5 and M6

Country	2-month horizon M(5)			2-month horizon (M6)			24-month horizon (M5)			24-month horizon (M6)		
	GS	RS	DS	GS	GS	RS	DS	GS	GS	RS	DS	GS
BFA	1.42	22.41	76.17	0.83	22.49	76.68	3.83	47.36	48.81	19.22	44.07	36.71
CIV	1.23	42.08	56.69	0.68	9.77	89.55	4.97	69.18	25.85	23.66	19.83	56.51
GHA	1.52	0.69	97.79	4.47	45.70	49.83	5.08	7.63	87.29	4.20	26.94	68.86
GMB	2.39	20.48	77.13	0.44	0.49	99.08	12.35	18.16	69.49	0.12	0.30	99.58
NER	0.04	78.35	21.61	0.62	37.29	62.09	0.97	88.28	10.75	10.79	53.01	36.20
NGA	1.59	11.50	86.91	0.62	1.71	97.67	6.18	27.62	66.20	0.68	5.78	93.54
SEN	0.18	39.81	60.01	1.30	39.38	59.32	1.21	55.78	43.01	16.44	33.12	50.44
TGO	0.38	66.18	33.44	2.11	27.51	70.38	0.69	81.11	18.20	3.60	49.27	47.13

Source: Authors' estimations.

4.6 Correlation of Domestic Shocks

The residuals from the SVAR of inflation model for each country are taken as the shocks; DS, RS and GS. If the correlation is zero, negative or small, then the shocks are asymmetric, but if they are strongly positive, then they are said to be symmetric (Regmi, Nikolsko-Rzhevskyy, and Thornton 2015). The correlation estimates of RS and GS are not reported as it is observed that they are all strongly positive. Table 8 reports the correlation estimates of models M2 and M3. According to Panel A, the

Table 8 Correlation of Inflationary Shocks: M2 and M3.

Panel A: Correlation of domestic inflationary shocks (M2)								
Country	**BFA**	**CIV**	**GHA**	**GMB**	**NER**	**NGA**	**SEN**	**TGO**
BFA	1.00							
CIV	-0.19	1.00						
GHA	-0.03	0.20	1.00					
GMB	-0.15	0.02	0.01	1.00				
NER	-0.58	-0.20	0.01	-0.00	1.00			
NGA	-0.05	0.05	0.07	-0.02	-0.04	1.00		
SEN	-0.17	-0.09	-0.29	-0.06	-0.28	-0.08	1.00	
TGO	-0.28	0.04	0.22	0.04	-0.27	0.17	-0.13	1.00

Panel A: Correlation of domestic inflationary shocks (M3)								
Country	**BFA**	**CIV**	**GHA**	**GMB**	**NER**	**NGA**	**SEN**	**TGO**
BFA	1.00							
CIV	-0.08	1.00						
GHA	-0.01	-0.04	1.00					
GMB	-0.25	-0.09	0.03	1.00				
NER	-0.07	0.05	0.04	-0.18	1.00			
NGA	-0.05	-0.08	-0.07	-0.02	-0.00	1.00		
SEN	0.01	0.10	-0.07	-0.25	-0.11	0.01	1.00	
TGO	-0.36	-0.32	-0.05	0.08	-0.34	-0.16	-0.47	1.00

Source: Authors' estimations.

Table 9 Correlation of Inflationary Shocks: M5 and M6

Panel A: Correlation of domestic inflationary shocks (M5)								
Country	**BFA**	**CIV**	**GHA**	**GMB**	**NER**	**NGA**	**SEN**	**TGO**
BFA	1.00							
CIV	-0.19	1.00						
GHA	-0.03	0.20	1.00					
GMB	-0.15	0.02	0.01	1.00				
NER	-0.58	-0.20	0.01	-0.00	1.00			
NGA	-0.05	0.05	0.07	-0.02	-0.04	1.00		
SEN	-0.17	-0.09	-0.29	-0.06	-0.28	-0.08	1.00	
TGO	-0.28	0.04	0.22	0.04	-0.27	0.17	-0.13	1.00

Panel A: Correlation of domestic inflationary shocks (M6)								
Country	**BFA**	**CIV**	**GHA**	**GMB**	**NER**	**NGA**	**SEN**	**TGO**
BFA	1.00							
CIV	-0.08	1.00						
GHA	-0.01	-0.04	1.00					
GMB	-0.25	-0.09	0.03	1.00				
NER	-0.07	0.05	0.04	-0.18	1.00			
NGA	-0.05	-0.08	-0.07	-0.02	-0.00	1.00		
SEN	0.01	0.10	-0.07	-0.25	-0.11	0.01	1.00	
TGO	-0.36	-0.32	-0.05	0.08	-0.34	-0.16	-0.47	1.00

Source: Authors' estimations.

correlation between Niger and Burkina Faso was strongly negative before the establishment of the WAEMU, but this figure fell significantly in absolute terms from 0.58 to 0.07 after the creation of the WAEMU, as shown in Panel B. The correlations between Burkina Faso and Togo, between Cote D'Ivoire and Togo, between Niger and Togo and between Senegal and Togo changed from -0.28, 0.04, 0.27, -0.13 to -0.36, -0.32, -0.34 and -0.47, respectively, as shown in Panel A and Panel B.

Table 9 reports the correlation estimates of M5 and M6 in order to compare the period before and after the creation of the WAMZ. It is clear that the creation of the WAMZ did not lead to the symmetry of shocks across the ECOWAS countries, as there is no strongly positive correlation estimate for model M6. Even considering China as one the global players does not make the domestic shocks symmetric, as none of the correlation estimates of M7 are strongly positive.

5. Discussion and Policy Implication

The results in the previous section will be compared against the research questions and then some policy options will be proposed based on the comparison. With regard to the first question, which asks whether the ECOWAS members meet the primary and secondary convergence criteria, none of the countries has met these criteria. Hence, the answer to the first research question is no, as revealed by the overview of these criteria in Section 1. The second question examines whether the domestic shocks are symmetric. The answer to this question is also no because the correlations of the domestic shocks are not strongly positive across all the countries, as indicated by Tables 4, 5, 8 and 9. This indicates that shocks that hit the ECOWAS members are asymmetric. The third question tests whether shocks in the ECOWAS countries are dominated by regional shocks. Variance decomposition in Tables 2, 3, 6 and 7 are used to address this question. All the ECOWAS countries, apart from Cote D'Ivoire, Niger and Togo, were not DS-dominated before the establishment of WAEMU, as shown by M2-2H and M3-24H of Table 6, but only Nigeria, the Gambia and Ghana were not RS-dominated after the creation of the WAEMU, as indicated by M3-2H. However, the longer horizon indicates that only Ghana and the Gambia were not RS-dominated as shown by M3-24H of Table 6. This implies that Nigeria and all the WAEMU countries became RS-dominated after the establishment of the WAEMU. Furthermore, Nigeria, Ghana and the Gambia were not RS-dominated even after the establishment of WAMZ, as shown by M6-2H and M6-24H of Table 7. The implication is that Nigeria, which was RS-dominated after the creation of WAEMU, ceased to be RS-dominated after the establishment of the WAMZ. Impulse response analysis is used to answer the fourth question, which examines whether the responses of the ECOWAS countries to a given shock are similar. According to M2-G, M2-R, M3-G, and M3-R of Figure 3, the paths of impulse responses are not similar for all the countries, even after the establishment of the WAEMU and WAMZ. Although some countries have similar paths of response to a given shock (GS or RS) in terms of sign, the magnitudes of the responses to inflationary shocks are different. Similar results are found for the models with oil price shocks.

The findings of this study correspond with the outcomes of similar studies. For example, Nigeria and Ghana stand out in the analyses similar to the outcomes of

Tsangarides and Qureshi (2008), Chuku (2012) and Adu, Litsios, and Baimbridge (2019). Additionally, Nigeria recorded the highest response of REER to oil price shocks, as reported by Adu, Litsios, and Baimbridge (2019). The heterogeneous responses of domestic inflation to global and regional shocks do not contradict the results of Alagidede, Coleman, and Cuestas (2012) and Chuku (2012). Furthermore, our results are in agreement with the outcomes of Houssa (2008) and Hefeker (2010) as the correlation of domestic shocks are more similar among the Francophone WAEMU members than the Anglophone WAMZ members. The reason for this could be that the WAEMU was formed earlier than the WAMZ. Thus, the members of the WAEMU are likely to have better coordination towards the formation of the MU than members of the WAMZ.

In essence, the answer to all the four questions is no; hence, forming a monetary union among the ECOWAS members by 2020 is nothing but a mirage. Nevertheless, the impulse response figures indicate that forming the WAEMU and WAMZ led to a lower magnitude of responses to both regional and global inflationary shocks.

6. Conclusion

Previous studies conducted in this area have focused on other sources of shocks than inflation and oil price. It is argued that inflationary and oil price shocks are equally important in any decision about forming an MU (Alagidede, Coleman, and Cuestas 2012; Adu, Litsios, and Baimbridge 2019). After conducting analysis using ECOWAS Convergence Criteria, impulse response, variance decomposition and correlation of these shocks, this study determines that the ECOWAS Vision 2020 aimed at forming a fully-fledged monetary union is nothing but a mirage. On the other hand, impulse response analysis shows that creating a common currency among the WAEMU countries serves as an inflationary shock absorber as the magnitudes of responses to both regional and global inflationary shocks fell after the establishment of the WAEMU. The analysis of variance decomposition further supports the advantage of creating a common currency, as all the WAEMU members and Nigeria have become RS-dominated since the inception of the WAEMU. Moreover, the study establishes the existence of a positive correlation of REER shocks among the Francophone countries. However, the correlation analysis of inflation indicates that neither the creation of the WAEMU nor the WAMZ has led to significant improvement of symmetry of the domestic inflationary shocks

Based on the forgoing analyses, this study arrives at the following conclusions. ECOWAS countries are not OCA-compatible as the responses of their inflation and REER to inflationary and oil price shocks are asymmetric, correlation of these shocks and their relative contribution to changes in inflation and REER vary across the countries. ECOWAS Vision 2020 is a mirage, as a single monetary policy could be costly for countries like Nigeria, Ghana and the Gambia as they could suffer from the creation of a common currency. However, the creation of a common currency among the WAEMU members has not only reduced the magnitudes of impulse responses but also made regional shocks dominate forecast error variance. To summarise, even though the ECOWAS Vision 2020 is not realizable, the creation of a single currency among the WAEMU members has helped to reduce the negative spillover effect of global and

regional shocks. Therefore, this study recommends that Nigeria, Ghana and the Gambia cannot be part of the vision of creating a single currency as they stand out from the rest of the countries, and that more coordination among the ECOWAS members is necessary before embarking on a pan-ECOWAS monetary unification.

This study is not intended to be exhaustive in this area as there are still some issues that can be explored in future researches. Other studies can be conducted using other forms of shocks than inflation and oil price, such as technological shocks.

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