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# Optimality of a monetary union: New evidence from exchange rate misalignments in West Africa

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ABSTRACT

This paper aims to study the optimality of a monetary union in West Africa by using a new methodology based on the analysis of convergence and co-movements between exchange rate misalignments. Two main advantages characterize this original framework. First, it brings together the information related to several optimum currency area criteria—such as price convergence, terms of trade shocks, trade and fiscal policies—going further than previous studies which are mainly based on only one criterion at a given time. Second, our study detects potential competitiveness differentials which play a key role in the debate on the optimality or not of a monetary union, as evidenced by the recent crisis in the Euro area. Relying on the recent panel cointegration techniques, cluster analyses and robustness tests, our results show that the WAEMU area is the most homogeneous area in Central and Western Africa and could be joined by Ghana, Gambia and, to a lesser extent, Sierra Leone, and that Ghana and Senegal appear to be the best reference countries for the creation of the whole West Africa monetary union.



## 1. Introduction

In recent years, there has been a renewed interest in analyzing monetary unions in Africa, especially with the project of the countries belonging to the Economic Community of West African States (ECOWAS) to form a new monetary union. The ECOWAS was established in 1975 in order to promote cooperation and economic integration in West Africa.[1] Noting the mitigated progress in terms of economic integration, ECOWAS leaders have quickly thought about the creation of a single currency to meet their goals. From 1983, several projects have been established (see Section 2.1), but they have been unheeded until the successful launch of the Euro in 1999. These projects have been revived through the establishment of convergence criteria, in 2000, whose achievements are decisive for the creation of the future monetary union.

In this paper, our aim is to contribute to this debate by analyzing the optimality of forming a monetary union in West Africa. An abundant literature,[2] generally based on the optimum currency area (OCA) criteria, has investigated the relevance of a monetary union within the ECOWAS area. These studies highlight the heterogeneity of West African countries, and generally conclude that one of the main problems of forming a monetary union is the inclusion of Nigeria. Indeed, the latter—which is the main economy and the most populous country of the ECOWAS (around 60% of the revenue and 52% of the population)—is structurally very different from other countries of this area. Consequently, the benefits of the ECOWAS monetary union should be considered with caution especially for WAEMU countries. Indeed, the expected gains for WAEMU countries, which record low inflation rates, should be lesser than those of the other area members (see De Grauwe, 1996 or Debrun et al., 2005). However, most of this previous literature is based on only one OCA criterion, leading frequently to contradictory results as evidenced by studies on supply and demand shocks or output and price convergence. This illustrates the "problem of inconclusiveness" highlighted by the literature on the OCA theory (see for instance, Tavlas, 1994 or Mongelli, 2008).

To address these concerns, we go further than the previous studies by proposing a global indicator related to economic competitiveness

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[1] ECOWAS area is actually composed by fifteen countries: eight West African Economic and Monetary Union (WAEMU) countries which share the same currency named "CFA franc", and the others that have each their own currency. The WAEMU consists of the following countries: Benin, Burkina Faso, Guinea Bissau, Ivory Coast, Mali, Niger, Senegal, and Togo. Its CFA franc, issued by the Central Bank of West African States, has been pegged to the French Franc and to the Euro since 1999. The convertibility of the CFA franc is however unlimited relative to the Euro and guaranteed by France. In return, the CFA zone countries depose at least 65% (50% for the WAEMU, since 2005) of their foreign reserves in a special operating account held by the French Treasury. The other ECOWAS countries are: Cape Verde, Gambia, Ghana, Guinea, Liberia, Nigeria and Sierra Leone. These countries, with the exception of Cape Verde and Liberia, stated their intention to create a new monetary union named West African Monetary Zone (WAMZ) before 2015. Thereafter, the WAMZ would merge with WAEMU in 2020 in order to build a monetary union of ECOWAS.

[2] See references in Section 2.2.

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which should play a key role in the debate on the optimality or not of a monetary union, especially after the recent crisis in the Euro area. More specifically, we focus on the similarities and dissimilarities of ECOWAS member states in terms of economic competitiveness through analyzing exchange rate misalignments, defined as the difference between the observed exchange rate and its equilibrium level. Since the equilibrium exchange rate is defined as the real exchange rate that allows an economy to reach its internal and external equilibriums, exchange rate misalignments constitute not only an indicator of competitiveness, but also a useful indicator of the viability of a monetary union.[3] Indeed, large differences in competitiveness between countries within a monetary union could lead to current imbalances, as evidenced by the recent experience of the Euro area (see Coudert et al., 2012).[4] In this context, it would be difficult for the common central bank to set up common and consensual policies (monetary and exchange rate), which in turn could challenge the stability of the union.

Consequently, we argue that a viable monetary union, which will be sustainable in the future, requires that countries forming this union should have close competitiveness levels. More specifically, we define as optimal a currency area in which economic policies are consistent and convergent. As real exchange rates affect and are affected by all other policies, we propose to test this optimality hypothesis by analyzing the behavior—convergence and co-movements—of the real exchange rate misalignments.

Turning to methodological issues, we rely on the Behavioral Equilibrium Exchange Rate approach (BEER) introduced by Clark and MacDonald (1998) to estimate the equilibrium exchange rate of ECOWAS countries and derive corresponding misalignments. Within this framework, the real equilibrium exchange rate is the solution of a long-run relationship between the real exchange rate and a set of macroeconomic fundamentals. To consistently estimate such long-run relationship, we use various recent panel cointegration techniques (Pool Mean Group, Dynamic OLS and Fully-Modified OLS estimators). We complement the investigation by a cluster analysis, allowing us to study similarities and dissimilarities of the CFA and WAMZ countries in terms of price competitiveness. Afterward, we use the Bayesian Model Averaging (BMA) approach to select relevant determinants of the equilibrium exchange rate and then to check the robustness of our findings to the model specification.

Using the annual data over the 1985–2009 period, our results confirm the heterogeneity and the non-optimality of the monetary unions in West Africa: CAEMC,[5] WAEMU and WAMZ. Despite these differences, among these areas, WAEMU seems to be the most homogeneous area with high correlation between its member countries' competitiveness level—a result that has been confirmed by cluster analyses on misalignments and robustness tests. Our findings also show that the WAEMU area can be joined by Ghana, Gambia and, to a lesser extent, by Sierra Leone from the WAMZ area. Nigeria, which appears alone in the WAMZ zone, displays interesting similarities with CAEMC member countries advocating for their merging. Finally, in the perspective of the creation of the monetary union of ECOWAS, we show that Ghana and Senegal would be the best references for the area since they are institutionally stable and economically relatively strong. In addition, misalignments of these two countries are positively correlated to those of most ECOWAS member states. By corroborating the main results of Bénassy-Quéré and Coupet (2005) and Tsangarides and Qureshi (2008) who use several variables related to the OCA criteria, our paper evidences the relevance of our global indicator based on exchange rate misalignments to assess the optimality of a monetary union.

The remaining of the paper is organized as follow. Section 2 presents the background of the ECOWAS area and reviews the literature on its optimality. Section 3 describes the empirical methodology and presents the results of panel unit root and cointegration tests, as well as the estimation of the long-run relationship. Section 4 analyzes the behavior of exchange rate misalignments derived from long-run estimated coefficients. In Section 5, we check the robustness of our findings using the Bayesian analysis before concluding the paper.

## 2. Background to the ECOWAS area and literature review

### 2.1. Background and state of convergence in the ECOWAS area

In the wake of their independence in the 1960s, Sub-Saharan Africa (SSA) countries have adopted different strategies in terms of exchange rate policy. Former British colonies have abandoned their currency boards to create their own currencies while the former French colonies decided to form a monetary union named "CFA franc zone". This situation, leading to the proliferation of non-convertible currencies, was seen as an obstacle to trade, integration and economic development. To promote regional integration, the Heads of States and Government of West African countries decided, in 1975 in Lagos (Nigeria), to create the ECOWAS. Thus, they established a clearing house whose purpose was to facilitate the use of national currencies for the settlement of trade between the members of the community.

The idea of a single currency for the ECOWAS area was explicitly mentioned for the first time in 1983 in Conakry (Guinea). On this occasion, the ECOWAS monetary cooperation program (EMCP) was proposed[6] before being validated in July 1987. In the short run, the EMCP should contribute to improve and strengthen the mechanism of the clearing house. To this end, the clearing house was substituted, in 1996, by the West African Monetary Agency (WAMA) which brings together all the central banks of the ECOWAS. This autonomous agency is however charged to manage the EMCP and ensure the harmonization of monetary policy framework. In the long run, the program should ensure the limited convertibility between currencies of the ECOWAS member states and that of the future common currency. The features of the ECOWAS monetary union have been defined in this program, that is: management and pooling of all reserves, common monetary policy and common convertible currency, an agreement on the convertibility guarantee, etc. So, the only difference between the *ECO* and the CFA franc is the uncertainty about the anchor currency.

However, the EMCP has been unheeded until the successful launch of the Euro in 1999 that has brought renewed interest in its achievement. To give new impetus to the program, ECOWAS leaders have decided in December 2000 to opt for another strategy that they called "Accelerated Integration". This strategy had two phases: the creation in 2003 of a second monetary union WAMZ whose common currency will be called "*ECO*", and the merging of the latter with the WAEMU in 2005. In this perspective, first-order and second-order convergence criteria have been defined. The first-order criteria, whose achievements are decisive for the creation of the future monetary union, are: single digit inflation rate; budget deficit lower than 4%; external reserves greater than 3 months of imports and central bank financing of government budget deficit lower than 10% of previous year's tax revenue. Concerning

[3] As misalignments are affected by many variables related to the OCA theory (price differences and economic fundamentals such as terms of trade shocks, trade and fiscal policies, productivity shocks, etc.) they can be viewed as an overall indicator of the viability of a monetary union compared to other OCA criteria. Moreover, Fielding (2005, pp. 12) argues the importance of the real exchange rate as well as that of the output and price shocks in analyzing the costs and benefits of a monetary union.

[4] Such a problem in the ECOWAS could easily lead to the collapse of the monetary union, since there is no natural leader, like Germany in the Euro area. Nigeria does not have credible monetary and budgetary policies since its inflation rate and budget deficits are higher than those of the WAEMU member states.

[5] The Central African Economic and Monetary Community is the second monetary union of the CFA zone whose member countries are Cameroon, Central African Republic, Chad, Congo Brazzaville, Equatorial Guinea, and Gabon.

[6] This project is part of a larger project initiated, in 1963, by the OAU (Organization of African Unity replaced by the African Union AU) whose aim is to create a single currency for all Africa. In this perspective, an expertise mission was led by Pr. Robert Triffin whose report was published in BCEAO *information and statistics note no 103*, February 1964. As suggested by Triffin's report, African Central Bank's Association was established in 1968 and five sub-programs around five African regions (North, South, East, Western and Central) were planed.