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Analysis of Convergence Criteria in a Proposed Monetary Union: A Study of the Economic Community of West African States

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ABSTRACT: This study examines the processes of the monetary union of the Economic Community of West African States (ECOWAS). It takes a critical look at the convergence criteria and the various conditions under which they are to be met. Using the panel least square technique an estimate of the beta convergence was made for the period 2000-2008. The findings show that nearly all the explanatory variables have indirect effects on the income growth rate and that there tends to be convergence in income over time. The speed of adjustment estimated is 0.2% per year and the half-life is -346.92. Thus the economies can make up for half of the distance that separates them from their stationary state. From the findings, it was concluded that a well integrated economy could further the achievement of steady growth in these countries in the long run.

Keywords: Monetary Union; Convergence Criteria; ECOWAS
JEL Classifications: C23; E42; F33; F41

1. Introduction

In recent times and as a consequence of the successful emergence of the Euro as the single currency of the European Union, there has been renewed global interest in economic and monetary integration as means of facilitating economic growth and development. Other regions are attempting to emulate the European Union by setting up institutional frameworks and establishing processes of convergence similar to that of the EU as prerequisites for wider monetary integration. Monetary integration is considered important in international economic relations because it plays important roles in the addressing of the problems of multiplicity of currencies and exchange rate regime that often hinders trade flows between countries. The expected benefits of such a union include promotion of trade; creation of larger market and widening of business/trade-related income-earning opportunities for the citizenry for improvement of their standard of living; facilitation of unhindered movements of persons and labour in the sub-region through dismantling of barriers, thereby strengthening cultural, economic, social and political cooperation (common central bank, judiciary, parliament, etc); creation of a more favourable environment for collective pooling of resources for development of essential regional infrastructure and enhancement of economic competitiveness, derivation of economics of scale, and reduction in transactions costs (Sanusi, 2003; Qureshi and Tsangarides, 2006).

One of the regions where efforts has been made to launch a monetary union is West Africa. Economic and Monetary integration in West Africa dates back to the colonial days. The Anglophone countries – The Gambia, Ghana, Nigeria and Sierra Leone operated under a common Currency Brand – The West African Currency Board, managed by the British, the legal tender being the Pounds Sterling. The Francophone countries – Benin, Burkina Faso (Upper Volta), Cote d'ivoire, Guinea,

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Mali, Niger, Senegal and Togo – also had similar arrangement with France, using the CFA Franc. The Anglophone arrangement was dissolved in the early 1960s, while the Francophone model continued and was developed into a full fledge Monetary Union in 1962 after the withdrawal of Guinea. As a result of renewed political commitment by member Governments, the Union was strengthened and expanded leading to the creation of the West African Economic and Monetary Union (UEMOA), in 1964. The Union currently has a lusophone country, Guinea Bissau (Rogers, 2004).

When the Economic Community of West African States (ECOWAS) comprising 15 West African countries (Benin, Cote d'lvore, Gambia, Guinea, Liberia, Nigeria, Burkina Faso, Cape Verde, Ghana, Guinea-Bissau, Mali, Niger Senegal , Sierra Leone and Togo) was formed in 1975, it was based on the realization of the need to further promote an economically integrated West Africa. However, despite economic integration, trade flow between the various integrating countries remains poor. Various studies on the performance of ECOWAS pointed to lack of a region wide monetary union as one of the factors responsible for low intra-regional trade in the sub-region (Ogunkola, 2001; 1997; 1995 and Jebuni, Ogunkola & Soludo, 1999). The vision of ECOWAS since it was founded in 1975 has been to create a single regional economic space having a single market and single currency that can accelerate socio-economic development and global competitiveness. Hence, in July 1987 ECOWAS adopted the ECOWAS Monetary Cooperation Programme (EMCP) with the specific objectives of improving and strengthening sub-regional payments systems under the West African Clearing House (now West African Monetary Agency - WAMA); introducing limited currency convertibility; establishing a single monetary zone, and eventually a common Central Bank and a single currency by the year 2000 (Sanusi, 2003). However, the proposed date for the realization of a single currency was later revised to 2005, 2009 and then 2020.

The EMCP contained a set of macroeconomic convergence criteria which member countries were expected to observe prior to the emergence of the monetary union. From the economic point of view, the convergence of macroeconomic policies is a pre-requisite for the creation of currency union and this would be viable only if the member countries first succeed in achieving comparable inflation rates and sustainable budget deficit, an approach known as "gradualism". Thus, to achieve the goal of regional trade liberalization and monetary union various activities such as preferential integration of intra regional trade, transport and communication projects, monetary integration and so on were slated for implementation. Two monetary zones were created namely the West African Monetary Zone (WAMZ), comprising of The Gambia, Ghana, Guinea, Nigeria and Sierra Leone and the CFA zone consisting eight Francophone States and Guinea Bissau. Both zones are part of the ECOWAS monetary integration programme (Qureshi and Tsangarides, 2006; Sanusi, 2003). The ultimate phase of ECOWAS sub-regional monetary integration efforts would be a merger of the WAMZ arrangement with the UEMOA (Union Economique et Monetaire Ouest Africaine) which already has a common central bank, the BCEAO.

By 1999 however, it was generally observed that the pace of implementation of the EMCP, especially the establishment of the single monetary zone, had not matched the expectations of the founding fathers. Some perceived major obstacles to successful implementation of the programme included: lack of political will and commitment; non-uniformity in the adoption of required macroeconomic framework and lack of policy coordination and harmonization between the Francophone West African countries which established an economic and monetary Union (UEMOA) in 1994 and the Anglophone countries (with the exception of the Republic of Guinea). Other problems include lack of political will and commitment on the part of member countries, different levels of development and shocks, distrust and suspicion among member countries, problem of meeting the stringent convergence criteria, inadequate financial market and infrastructure, problem of regulating and supervising the financial market integration and how to conduct effective monetary and fiscal policies. The net effects have been setback on general growth structure of the ECOWAS countries through long periods of macroeconomic instability.

In 2001, a surveillance mechanism was adopted. The intention of the surveillance mechanism was to serve as the regional instrument for monitoring the harmonization of macro-economic and financial policies of member-states and it becomes a crucial move in the achievement of monetary integration objectives particularly that of a common currency by 2020. The revised road map for the realization of a single currency for West Africa by 2020 was approved in 2009 after the adoption of

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the report of the inter-institutional working group on the ECOWAS single currency. Activities to be undertaken ahead of the new dates including the review and harmonization of the convergence criteria, the harmonization of statistics, domestic policies and the legal, accounting and statistical frame works of public finance. Moreover, between 2009 and the first three months of 2013, the harmonization of the regulatory and supervisory framework for banking and other financial institutions, the establishment of a payment system infrastructure for cross border transactions, the completion of the payment system infrastructure in Guinea, The Gambia and Sierra Leone and the completion of the on-going integration of the financial markets of the region was envisaged.

In the light of the above, this study examines the structure and trend in monetary union formation as it concerns the ECOWAS and the appropriateness of the convergence criteria. The study evaluates the convergence criteria for the ECOWAS, WAMZ and WAEMU from 2000 to 2010. The paper is divided into six sections. Following this introductory note is the literature review which forms section II. In section III, a descriptive review of the extent of achievement of the convergence criteria was carried out while section IV presents the empirical model to be estimated. Section V provides the discussion of empirical results while section VI concludes the paper.

2. Theoretical Considerations

2.1 Nature of Monetary Union and Need for Convergence Criteria

Monetary union refers a group of economies that have decided to share a common currency and thus a common monetary policy (Mankiw, 2003). Burda and Wyplosz (2001) defined it as an agreement among sovereign countries to use a common currency. According to these authors, it involves the irrevocable fixing of exchange rate and the abandonment of margins of fluctuation among a number of currencies with the implication that individual currencies are no longer distinguishable and a common currency may be substituted, individual central banks lose their autonomy and a single central bank takes care of the management of the common currency. A monetary union may not necesarily involve having a single circulating currency, but it entails a common monetary policy in an environment where capital controls have been freed and financial markets are not segmented (Masson, 1992). A monetary union is thus an epitome of full (or nearly complete) monetary integration, referring to a zone or an area within which the monetary policy and exchange rates of the countries that constitute the union is managed in such a way as to achieve common economic objectives.

As noted earlier, a monetary union is an arrangement whereby a group of countries agree to use a common currency and adhere to a single monetary and exchange rate policy. Since the countries usually reflect monetary and fiscal diversity, they need to show a threshold level of convergence before they become members of such an arrangement. To ensure such a convergence, an appropriate set of convergence criteria is agreed upon, which each member country is supposed to qualify. Some criteria are deemed mandatory for entry only, while others are essential for entry as well as for the successful operation of the arrangement subsequently. The convergence required for a monetary union is two-pronged: monetary convergence and fiscal convergence, hence criteria are needed in both the areas. The key indicators used in the criteria in the former case include inflation, interest rate, and foreign exchange; and in the latter case, budget deficit and public debt (Ali, n.d).

According to Ali (n.d) the criticality of monetary criteria is relatively docile; they are relevant only for entry. Their relevance ceases to exist once monetary union comes into existence because once the monetary union is established, it, by default, achieves a high degree of monetary convergence through adopting a single currency and thereby a single exchange rate. In other words, the role of monetary convergence criterion is only to serve as a tool to check whether an adequate degree of monetary convergence has been achieved and maintained in the run-up to monetary union. In contrast to that of monetary criteria, the criticality of fiscal criteria is massive. This is so because fiscal policy still remains a national prerogative even after monetary union comes into existence. If a strong fiscal policy coordination framework is not put in place, undisciplined national fiscal policies with undesirable spillover effects between member states may conflict with a stability-oriented monetary policy and have the potential to ultimately undermine the very existence of the monetary union. Thus, fiscal criteria serve both as entry criteria (to meet conditions of threshold level of fiscal convergence) and permanent criteria (to sustain a stability-oriented single currency monetary union).

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2.2 Theoretical Appraisal of a Currency Union

The seminal paper of Mundell (1961) paved the way for the use of the theory of Optimum Currency Areas (OCAs) in the analysis of monetary union issues. The traditional theory of OCAs stems from the recognition that foreign trade imposes special trading costs (such as transport and monetary trade costs) that are not encountered in domestic trading. The monetary trade costs arise because of the existence of multiple currencies and multiple units of account. In a modern economy, unlike the barter system, multiple currencies raise problems of currency conversion. The theory compares and balances the costs and benefits of forming a monetary union. The net benefit is usually viewed as accruing to the union as a whole rather than to the individual cooperating countries. Indeed, the net benefit is a crucial factor in the formation of a monetary union based on economic grounds.

In theory, currency union can generate both the dynamic and static effects. Dramani (2011) states that the adoption of common currency can result in reduction of uncertainty, increasing commercial relationship and reduction in the negative externalities between the zone countries. Other expected benefits are true price comparison and exchange rate risk removal and inducement of a competitive environment. With a single currency, monetary union is likely to improve economic efficiency through lowering cost of currency conversion. Currency conversion involves a medium of exchange or transactions medium subject to a network externality (Dowd and Greenaway, 1993). According to traditional theory of OCAs, common currency is most appropriate for countries with similar shocks and business cycles, high trade integration, internal labor flexibility and fiscal policy flexibility (Glick, 2011).

Theoretical models of Rose and Van Wincoop (2001) suggests that a single currency has more relevance than is expected. National currency seems to be one of the barriers to international trade. The gravity model adopted with dummy variables denoting countries with a different currency and multilateral currency unions in their study of real benefits of currency unions shows that currency union lower barrier peculiar to national borders and this leads to trade and welfare. Uncertainty in most cases reduces potential investment flows. Fluctuations in exchange rates increase firms' potential risks to make investments. Several models have shown that reduction in exchange rate volatility increases trade and vice-versa. Kilic, Bayar and Arica in their 2014 study of the effects of European Economic and Monetary Union on inflows of foreign direct investments to the Eurozone concluded that the Union contributes to the inflow of foreign direct investment into the Eurozone by reducing the exchange rate volatility, inflation volatility and distance, and supporting economic growth.

Common currency has significant effects on reduction of exchange rate volatility (Rose, 2000; Frankel and Rose, 1998). It is however noted that currency union has a much higher effect on trade than that of only reducing exchange rate volatility. With common currency, consumers are able to make a more direct comparison of the value of goods traded. It therefore follows that the ability to directly compare value and price of goods traded allows several markets to come together forming homogeneous structure based on one common unit of account. Adoption of a single currency exposes domestic markets to foreign markets thereby increasing competition between member countries and changes the competitiveness of national industries which require adjustments in the structure of production and distribution processes (Alexander and Mandler, 2006). This might boost the productivity of domestic industries; create more innovation and new methods of reducing costs.

The main cost of a monetary union is the member country's loss of the ability to manipulate the value of its currency and to conduct an independent monetary policy such as devaluing its currency and adjusting its interest rate as a tool for macroeconomic adjustment. So long as a nominal exchange rate has real effects, the elimination of national currencies in a monetary union has a cost. Exchange rate as a policy instrument can affect relative prices such as the real wage and the relative price of traded to non-traded goods.

When economies surrender their national currencies, the management of shocks is left to other policy instruments such as fiscal policy. However, since macroeconomic disturbances affect different economies differently, the analysis of costs of forming a monetary union has been understandably concentrated on asymmetric shocks and alternative adjustment mechanisms. If the costs facing the countries are asymmetric, then the formation of a monetary union among them may not be beneficial as it can lead to deeper recession and more a pronounced business cycle (Bayoumi and Ostry, 1997;

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Bayoumi et al., 1997). There are efforts at distinguishing between supply and demand shocks. The issues in alternative adjustment mechanisms have focused on labour mobility within the union, wages and prices, and fiscal policy among others.

The traditional theory of OCAs can be appreciated from the perspective of the costs of forming a monetary union. There are three criterion involved. The first criterion is high degree of factor mobility, especially labour. This is an essential element in the formation of an enduring monetary union (Mundell, 1961). Mundell postulates that if there is a high degree of labour mobility within a region, the cost of forming a monetary union in the region will be minimized. The view is that high mobility of factors of production allows an economy within a monetary union to deal with asymmetric shocks through migration, lessening the need for adjustment through exchange rate changes. Thus, it can be averred that this proposition is based on an alternative adjustment mechanism.

The second criterion, postulated by McKinnon (1963), is based on a similar argument. If there is a high degree of openness among nations prior to the establishment of a monetary union, the formation of such a union is likely to be beneficial as most prices are already being determined in the market. Indeed, the deviations from the law of purchasing power parity of individual countries are a reflection of country risks. Formation of a monetary union among countries with a high degree of openness eliminates the divergences of different national currencies in the union. Since this is likely to have been minimal prior to the formation of the union, the benefits of eliminating transaction costs relative to the overall costs of monetary union will ultimately be beneficial to the region.

Kenen (1969) proposes the third criterion, which is the degree of product diversification among the countries intending to form a monetary union. The assumption is that a more diversified economy is less likely to suffer from a country-specific shock and the country's exchange rate is therefore less useful in macroeconomic adjustment.

3. The Convergence Criteria Status in ECOWAS: A Snap-Shot

In this section, we examine the status of both the primary and secondary criteria in ECOWAS countries. The proposed Convergence criteria in the three monetary zones are presented in Table 1 and the extent to which the ECOWAS countries attained these criteria within the specified period are assessed.

Within the specified period, while some ECOWAS countries met some of the convergence criteria, some did not. First, there was a high level of fiscal deficit and this remained a major macroeconomic management policy challenge for ECOWAS member states during the period under review. In 2007 only six countries met this target namely Benin, Cote d'lvore, Gambia, Guinea, Liberia and Nigeria while nine countries did not meet this target namely Burkina Faso, Cape Verde, Ghana, Guinea-Bissau, Mali, Niger Senegal , Sierra Leone and Togo**.** In terms of inflation rates, seven countries namely Benin, Burkina Faso, Cape Verde, Cote d'lvore, Mali, Niger and Togo achieved this objective while the other eight countries did not meet the target in year 2007.

Performance in terms of budget deficit financing by the Central bank remained impressive during the period as 14 countries met the target in 2007. The Performance with regard to the accumulation of gross external reserves in 2007 within ECOWAS remained virtually the same with the eight UEMOA countries and Nigeria meeting the target as in previous years. While the reserves positions of Cape Verde, Guinea and Liberia was a cause of concern. All the UEMOA countries registered no domestic arrears of accumulation during the review period. While information was not available for Cape Verde, Liberia and the WAMZ Countries for evaluation of this criterion. Performance in terms of tax receipt remained low during the review. Only three countries fulfilled this criterion namely Cape Verde, Ghana and Senegal.

The wage bill which forms a significant proportion of recurrent expenditure in ECOWAS member states is also monitored to highlight its impacts on the budget. As at the end of 2007, eight countries (Benin, Gambia, Guinea, Mali, Niger, Nigeria, Senegal and Togo) met this target. The criterion which monitors utilization of domestic resources for the investment needs of member countries suffer similar fate with the tax revenue mobilization criterion, although it is a bit better in terms of countries meeting the target. Seven countries (Benin, Burkina Faso, Ghana, Mali, Niger, Nigeria and Senegal) achieved the target in 2007.

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Table 1. Proposed Convergence Criteria in ECOWAS, WAMZ and WAEMU

ECOWAS	
Primary criteria	**Secondary criteria**
1. Overall fiscal deficit including grants/GDP ratio ≤ 3% 2. Average annual inflation rate ≤ 5% 3. Central Bank financing of the budget deficit ≤ 10% of previous year's tax revenue 4. Gross reserves ≥ 6 months of import cover.	1. Non-accumulation of domestic and external arrears and settlement of all outstanding arrears 2. Tax revenue/GDP ratio ≥ 20% 3. Wage bill/tax revenue ≤ 35% 4. Internally funded public investment/tax revenue ≥ 20% 5. Positive real interest rate 6. Real GDP growth rate ≥ 7%
WAMZ	
Primary criteria	**Secondary criteria**
1. Overall fiscal deficit including grants/GDP ratio ≤ 3% 2. Average annual inflation rate ≤ 5% 3. Central Bank financing of the budget deficit ≤ 10% of previous year's tax revenue 4. Gross reserves ≥ 3 months of import cover.	1. Non-accumulation of domestic and external arrears and settlement of all outstanding arrears 2. Tax revenue/GDP ratio ≥ 20% 3. Wage bill/tax revenue ≤ 35% 4. Internally funded public investment/tax revenue ≥ 20% 5. Positive real interest rate 6. Real GDP growth rate ≥ 7%
WAEMU	
Primary criteria	**Secondary criteria**
1. Basic fiscal balance/nominal GDP ratio ≥ 0 2. Average annual inflation rate ≤ 5% 3. Outstanding domestic and external debt/GDP ≤ 70%	1. Payment arrears: non-accumulation of payment arrears in the management of the current period. all outstanding arrears 2. Wage bill/tax revenue ≤ 35% 3. Internally funded public investment/tax revenue ≥ 20% 4. Tax revenue/GDP ratio ≥ 17% 5. Real GDP growth rate ≥ 7%

Source: Extracted from a study on the harmonization of convergence criteria within ECOWAS, Conakry (2011)

Two major exchange rate regimes exist within ECOWAS, the fixed exchange rate regime for Cape Verde and the countries of UEMOA and flexible exchange rate regime for Liberia and the countries of WAMZ. The co-existence of the two exchange rate regimes makes any evaluation based on the movements of the nominal exchange rate of little relevance, which makes analysis based on real exchange rate development more meaningful and appropriate. The real interest rate has been constantly negative in some countries despite the effect made with the view to solving the related problems of high inflation rates .The prevalence of negative real interest rates is inimical to domestic savings mobilization and financial intermediation which underscores the importance of the criterion as a key macroeconomic variable. Nine Countries (Benin, Burkina Faso, Cape Verde, The Gambia, Guinea, Mali, Nigeria, Sierra Leone and Togo) met this criterion.

4. Model Specification, Estimation and Discussion

4.1 The Model

The theory of convergence is in line with the neoclassical growth model (Solow, 1956; Swan 1956). This explains the fact that there is a tendency over the long term to level the rate of income growth or that of per capita production in different zones. Hence convergence exists when a "poor" economy tends to increase more rapidly than a "rich" economy such that the poor economy will catch up with the level of income per capita production of the "rich "economy. This is refered to in the literature as the β convergence (Barro and Sala-i-Martin, 1995). In the present case, we concentrate on the conditional convergence in which case, ECOWAS countries are assumed to be identical in terms of references, technologies and economic policies; one of which is the formation of a single currency by 2020. Based on the neo-classical model of growth (Solow 1956), an economy's growth rate is predicted to be positively correlated with the distance that separates it from its own stationary.

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There is β convergence if the estimated β is significantly negative holding other effects constant. Following the neo-classical model, we specify the empirical model as:

$$\left(\frac{1}{T}\right)\ln\left(gdpg\right)=\alpha+\beta\ln\left(gdp(-1)\right)+\delta Xi+\varepsilon i \qquad .....1$$

Where $gdpg$ = income growth rate, $gdp(-1)$ = initial income level and Xi = state variables including Central Bank Financing (CBNFIN), Fiscal Deficit (FD), Inflation rate (INF), Public Investment (PUBINV), Real Exchange Rate (REXCR), Real Interest Rate (RINTR), Tax Revenue (TAX REV), Wage Bill (WAGE BIL) and External Reserve (EXTREX). The value of β enables us to estimate the speed of convergence $\phi=-\ln\left(\frac{1+T\beta}{T}\right)$ 2

and the necessary condition required to attain half of the distance that separate them from their stationary state

(The half- life) $\tau=-\left(\frac{\ln 2}{\ln(1+\beta)}\right)$ 3

4.2. Results and Discussion

Table 2 describes statistical behaviour of the variables used in our model. The mean values are at variance across all variables and do not have the tendency to coincide, ditto the median values. The highest positive mean value of 17.365 comes from PUBINV with lowest value of -2.215 from REXCR. The CBNFIN has the lowest and positive median value of 0.000 with highest value of 38.00 from WAGE_BIL. The most fluctuating variable given by its spread is WAGE_BIL with standard deviation of 21.088. This may be because issue of wage has often remained controversial as noticed in the labour theory. Only three variables - GDPG, REXCR and RINTR have their tail skewed to the left. The coefficient of kurtosis is positive for all the variables. But the value demonstrating the highest peakedness is 15.495. The J-B probability values show that all the distributions are non-normal.

Table 2. Descriptive Statistics Summary

Measure	CBNFIN	FD	GDPG	INF	PUBINV	REXCR	RINTR	TAX_REV	WAGE_BIL	EXTREX
Mean	4.794	7.600	0.026	5.630	17.365	-2.215	0.038	14.957	42.965	4.010
Median	0.000	6.900	0.089	3.400	16.400	-0.450	1.050	14.600	38.000	3.700
Std. dev	14.223	5.467	0.523	7.649	11.120	18.378	5.225	3.913	21.088	2.790
Skewness	3.508	1.353	-1.402	2.400	0.580	-2.502	-2.129	0.440	2.887	1.613
Kurtosis	15.358	5.085	14.452	9.739	2.531	15.495	8.997	2.380	12.553	6.006
J.B Prob	0.000	0.000	0.000	0.000	0.027	0.000	0.000	0.000	0.000	0.000

Source: Authors' computation using E-Views

The panel unit root test results are displayed in table 3. The Levin, Lin and Chu test method is used on the ground that it is widely used in the literature and is powerful when applied to panels of moderate size. However, the test depends crucially on the somewhat restrictive independence and identical assumptions across individuals. Only three variables - CBNFIN, GDPG and REXCR are without unit root in their levels, they are therefore integrated in their levels. The remaining variables are without unit root in their first differences and this follows the common experience in the literature. On this basis, other econometric specification results are not likely to be spurious.

Table 3. Panel Unit Root Test of Equality of Means

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	Test Method	***Statistic***	***OI***	***Decision***	***Test Method***	***Degree of freedom***	***Value***	***Prob***
CBNFIN	Levin, Lin & Chu	13438.1	I(0)	No unit root	Anova F test	(18,1935)	60138207	0.000
EXTRES	Levin, Lin & Chu	12.8732	I(1)	No unit root				
FD	Levin, Lin & Chu	4.961	I(1))	No unit root				
GDPG	Levin, Lin & Chu	7.807	I(0)	No unit root				
PUBINV	Levin, Lin & Chu	4.593	I(1)	No unit root				
REXCR	Levin, Lin & Chu	4.138	I(0)	No unit root				
TAX_REV	Levin, Lin & Chu	2.067	I(1)	No unit root				
WAGE_BIL	Levin, Lin & Chu	15.201	I(1)	No unit root				

Source: Authors' computation using E-Views

On the right panel of same table is the test of equality of means. The test method is based on Anova test with degree of freedom (18, 1935). The probability value is an indication that the means of the distribution is not just equal to a specified value. The panel least square estimation result is shown below:

$$GDPG = \underset{(-1.495)}{-0.502} - \underset{(-0.050)}{0.002GDP(-1)} - \underset{(-0.241)}{0.0003CBNFIN} - \underset{(-2.606)}{0.106FD} - \underset{(-1.275)}{0.014EXIRES} - \underset{(-1.831)}{0.011INF}$$

$$+ \underset{(1.338)}{0.103PUBINV} + \underset{(1.519)}{0.144TAX_REV} + \underset{(1.041)}{0.089WAGE_BIL} - \underset{(-0.643)}{0.001REXCR} - \underset{(-1.139)}{0.006RINIR}$$

$$R^2 = 0.53, DW = 1.88$$

The panel least square estimation displayed above shows that nearly all the explanatory have indirect effects on the income growth rate (GDPG). The Central Bank deficit financing variable (CBNFIN) for ECOWAS as a whole impact negatively on the income level and is as low as 0.0003. By implication, a one unit reduction in the proportion of government deficit financing would induce about 0.03 percentage increase in the income growth rate. Over spending of the government leading to deficit financing may not likely spur growth especially if directed towards unproductive activities and is not among the criteria likely to generate convergence. The fiscal deficit variable (FD) also gives similar relationship except that its negative significant impact on the income growth rate is such that a one percent increase in fiscal deficit results in about 0.11 percent reduction in the income growth. A higher deficit financing for the purpose of developing an unproductive sector could lead to declining growth and is in fact expected. External reserves variable (EXTRES) demonstrates a non-significant negative relationship. This shows some economic irregularities.

Inflation rate is significantly negatively related to income growth as is widely found in the literature. This implies that instability in the price level is not likely to support growth. On the real interest rate, the negative coefficient of -0.006, though negligible, is pointer to the increasing investment opportunity which leads to increasing growth rate. The interpretation here therefore needs caution. The investment climate in some ECOWAS countries is highly attractive and this tends to move investment forward. The exchange rate coefficient has a negative impact on growth demonstrating the fluctuating manner of exchange rate.

The partial effect of the initial income on the current income is negative but not significant implying that a one percent increases in the initial income results in about 0.002 decreases in current income. The negative impact is a demonstration of the likely convergence among ECOWAS countries. Poor countries in ECOWAS are likely to grow faster than the rich countries and in the long run operate at approximately same income level. Meeting the convergence conditions may bring about some unification in economic policies particularly as the move towards monetary union is on cause.

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The speed of convergence estimated is 0.2% per year and the half-life is -346.92. Thus the economies can make up for half of the distance that separates them from their stationary state.

The macro indicators show a fairly high explanatory power of about 53 percent. The degree of autocorrelation is low as demonstrated by the Durbin-Watson statistic (DW) value of 1.88. The analysis is extended to a Wald test of coefficient restrictions. For the coefficient restrictions, we assumed that all the slope coefficients have the same effects of either being significant or not. The Wald tests (Table 4) shows that the F-statistics is significant showing that the variables have non-zero effect on the ECOWAS economy.

Table 4. The Wald Test

	Wald Test		
F-statistic	10,20	6.612	0.0002
Chi-square	10	66.119	0.0000
Normality restriction(=0)			
C(1)		-0.502	
C(2)		-0.002	
C(3)		-0.0003	
C(4)		-0.106	
C(5)		-0.014	
C(6)		-0.011	
C(7)		0.103	
C(8)		0.144	
C(9)		0.089	
C(10)		-0.0008	

Source: Authors' computation using E-views

5. Conclusion

The drive towards the economic and monetary integration of West Africa dates back to the colonial period. Hence, when the ECOWAS was founded in 1975, one of its critical objectives was to create a single regional economic space with a single market and a single currency as a way of accelerating socio-economic development in the region. This culminated in the creation of two monetary zones - the West African Monetary Zone (WAMZ), and the CFA zone both of which are part of the ECOWAS monetary integration programme with the ultimate objective of an eventual merger of the two monetary arrangements to produce a single economic and monetary union.

This study evaluated the proposed monetary union in respect of ECOWAS economies. Based on this plan, an attempt was made to analyse the convergence criteria and the degree of convergence for the economies having such monetary union plans. The results of the estimation prove that there tends to be convergence in income levels among the economies concerned even though their stages of growth process are at variance. It follows therefore that integrating through the monetary union is a pointer towards achieving a more steady growth and better equilibrium state. There need be economic cooperation through policies that can enhance such a vision of well integrated economies as it is difficult to maintain a monetary union without effective fiscal policy mechanism and political support.

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