West African Monetary Agency (WAMA)

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EDITORIAL

The West African Monetary Agency (WAMA) bulletin provides information on the activities of the Agency and also presents research output on topical economic issues. It is our pleasure therefore to keep you updated with this edition of the bulletin.

In this issue, readers are opportune to be updated with an abridged version of the Agency's progress report authored by the Director General of the WAMA, Mr. Momodou Bamba Saho who also doubles as the chief editor of this Bulletin. The report highlights progress made in the West African Economy through tracking the key macroeconomic developments of member countries with respect to implementation of the ECOWAS Monetary Cooperation Programme (EMCP). This edition provides information on progress made thus far, by highlighting ongoing studies which are activities aimed at achieving the objectives of the roadmap programme for the single currency. It also documents the challenges arising from the process of implementing of the ECOWAS single currency programme as well as drawbacks experienced by member countries due to Covid-19 Pandemic in meeting up with the convergence criteria.

Also in the Bulletin, are studies on Central banking under monetary union arrangement: Lessons for ECOWAS. Finally, it presents a study on Predicting and forecasting optimum currency area: Indices for ECOWAS. We hope that the information provided in this issue would be beneficial to readers and stakeholders of the ECOWAS Monetary Cooperation Programme. We happily welcome your views, which would certainly enable us improve the quality of future editions.

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WAMA Digest:
DIRECT GENERAL'S PROGRESS REPORT

MOMODU BAMBA SAHO

Introduction

The year 2020 is a critical juncture for the ECOWAS Monetary Cooperation Program (EMCP). The ECOWAS single currency was scheduled to be created in 2020. However, policy makers in Member States are navigating the major challenges imposed by the COVID-19 pandemic. What started as a public health crisis in late 2019 has now evolved into an economic crisis of unprecedented proportions with many economies around the world in recession. The human and economic cost of the pandemic will have a devastating impact on the economies of Member States. Economic activity in ECOWAS would be significantly affected on both the demand and supply sides. Amongst other issues: the collapse in the price of oil, the pressures on budgets for increased expenditure on public health and social safety nets, declines in remittances and receipts from travel and tourism, depression of economic activity from the various lockdowns in the region and disruptions in global supply chains. These connected shocks are expected to lead to a severe reduction in economic activity and limit the ability of Member States to comply with the convergence criteria.

Policy makers across the region have prioritized measures to mitigate the health shock and stabilize national economies. It is likely that economic recovery plan will be drawn out. The aggregate output in ECOWAS is expected to contract by 2.1 percent in 2020, reflecting contraction in some major economies. Compliance with the convergence criteria will also deteriorate. We now expect that only one Member State may meet all four primary convergence criteria in 2020. These developments require exhaustive consultations among Member States to explore further scope for collaboration and chart a way forward that will preserve the spirit of the EMCP. The West African Monetary Agency (WAMA) will continue to work with the Member Central Banks to steer through this path.

Overview of the Macroeconomic Situation in the ECOWAS in 2019

The global economy slowed to 2.9 percent in 2019, from 3.6 percent in 2018. This development was due to the uncertainties created by disruption in automobile industry in the Euro area, prolonged trade dispute between the US and China as well as sluggish investment and recovery in some major economies. The international Monetary Fund (IMF), in its June 2020 World Economic Outlook (WEO) update, projects global growth at -4.9 percent in 2020 on account of the impact of the pandemic.

In spite of the global headwinds, economic activity in ECOWAS continued to strengthen in 2019, recording an aggregate growth rate of 3.3 percent compared to 3.0 percent in the preceding year. Most Member States recorded robust growth rates ranging between 5.0 - 7.3 percent. Performance was mainly occasioned by improvements in mining (especially oil and gas production), continued investments in public infrastructure, agriculture and services (especially, in ICT and financial services) and favourable rainfall patterns.

Inflation declined in most Member States in 2019, largely reflecting moderation in food prices and exchange rate stability. However, aggregate end-period inflation increased slightly to 9.8 percent from 9.7 percent in 2018, due to budding inflationary pressures in Nigeria. Generally, the West African Economic and Monetary Union (WAEMU) experienced deflationary pressures, driven by higher output in cereal production and implementation of policies aimed at reducing production cost and providing markets for agricultural products. In the West African Monetary Zone (WAMZ), Liberia, Nigeria and Sierra Leone continued to record double-digit inflation in 2019.

Generally, fiscal policy in 2019 focused on strengthening tax administration to enhance revenue whilst minimizing leakages and rationalizing expenditure. Member States made modest gains in this regard as the overall aggregate budget deficit (excluding grants) narrowed to 1.4 percent of GDP from 1.8 percent of GDP in 2018, although the fiscal consolidation drive impinged on moderation in capital expenditure in some economies. In spite of the efforts, budget deficits remained high in Burkina Faso, Guinea Bissau, Niger, Senegal, Togo, Gambia, Sierra Leone and Cabo Verde.

External sector developments were mixed across the region. Merchandise trade improved in two-thirds of the Member States during the review period. However, the aggregate current account deficit widened significantly to 4.0 percent of GDP in 2019, from 0.3 percent in the preceding year, driven mainly by a surge in non-oil imports in Nigeria.

Status of Macroeconomic Convergence

Performance under the macroeco-nomic convergence programme improved as seven Member States (Benin, Burkina Faso, Cabo Verde, Cote d'Ivoire, Mali, Niger and Togo), complied with all the four primary criteria in 2019, compared to four (Benin, Cabo verde, Niger and Togo) in 2018. The number of Member States that complied with at least three primary criteria in 2019 also increased to thirteen, from ten in 2018. Only Togo sustained compliance with all the four primary criteria over the three-year period 2017 – 2019, whilst ten Member States sustained compliance with at least three primary criteria.

Performance improved with regards to the criteria on budget deficit and central bank financing and was sustained on inflation and gross external reserves. Eleven Member States (Benin, Burkina Faso, Cabo Verde, Cote d'Ivoire, Guinea, Liberia, Mali, Niger, Nigeria, Sierra Leone and Togo) met the criterion on budget deficit in 2019 compared to seven in 2018. This was the best performance on this criterion for many years consequent on increased revenue generation and capital expenditure moderation.

Fig 1: Compliance of the Member States with the Primary Criteria end-December 2019
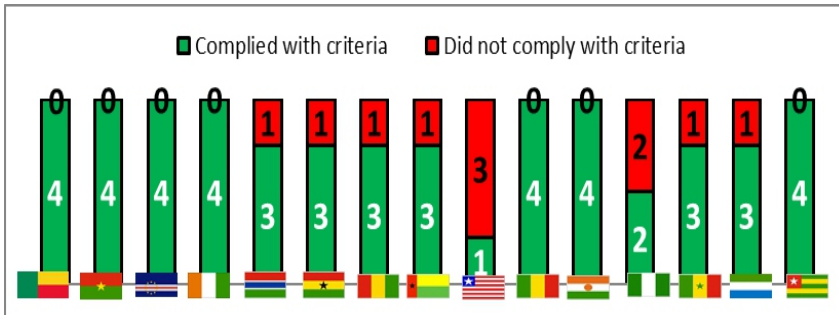
Source: WAMA Computation (2019)

Inflationary pressures moderated in many Member States during 2019 largely reflected by the tight monetary policy stance of some Member States and the moderation in food and fuel prices. Article 12 (New) of the Supplementary Act 2015 provides that the convergence criteria for inflation shall be less than 10 percent with a long term goal of less than or equal to 5 percent by 2019. On that basis, nine Member States (Benin, Burkina Faso, Cabo Verde, Cote d'Ivoire, Guinea Bissau, Mali, Niger, Senegal and Togo) met the inflation criterion in 2019.

Almost all ECOWAS member countries met the criterion on central bank budget deficit financing except Nigeria and Liberia in 2019 compared to ten in 2018. Similarly, thirteen out of fifteen member countries met the criteria on gross external reserves in 2019. Only Guinea and Liberia

missed the target consistently. Improving current account positions and increased foreign exchange inflows in a number of Member States have significantly contributed to this performance. In the period 2016 – 2019, performance under this criterion remained the most consistent; with at least twelve (12) Member States meeting the target.

Monitoring Financial Sector Developments

On the state of financial sector development in ECOWAS as at 2019 using the FSI indicator, It was shown that the banking system was adequately capitalized in all the Member States with the exception of one country. Similarly, there were no liquidity issues during the period. However, profitability challenges persisted in few Member States while Non Performing Loans remained high in almost all the Member States

with the exception of Burkina Faso, The Gambia and Guinea

Assessment of Exchange Rate Developments

On the state of assessment of exchange rate development, available data shows that ECOWAS currencies recorded mixed performances in the first half of 2020 as a result of the COVID-19 pandemic. Most central banks in the sub-region took emergency measures to mitigate the impact of the pandemic on economic activity and overall financial stability. The cedi, leone, Guinean franc and the naira appreciated against the West African Unit of Account (WAUA) compared to their performance at the end of December 2019. However, the CFAF, escudo, Liberian dollar and dalasi depreciated against the WAUA.

Changes in bilateral exchange rates indicated that the cedi was the only currency that appreciated against all ECOWAS currencies in the first half of 2020. This could be due to a drop in the demand for foreign exchange for imports from China, the country's main supplier. Other currencies that appreciated were the Guinean franc and the naira. The Liberian dollar, on the other hand, depreci-

ated against all ECOWAS currencies, followed by the FCFA and escudo. This depreciation was caused by increased demand for foreign exchange vis-à-vis the limited supply from export receipts. This explains why some central banks in the region often use their policy rates or foreign exchange reserves to reduce the depreciation of their national currencies.

Implementation of other Roadmap Activities

The implementation of the EMCP has been guided by the Roadmap for the ECOWAS Single Currency Program adopted by the Convergence Council on 25th May, 2009 in Abuja. At its 5th Meeting held in Accra on 21st February 2018, the Presidential Task Force adopted a Revised Roadmap for the ECOWAS Single Currency Program. In order to achieve the single currency program, activities that were and are still being implemented by WAMA include proposal on; creation of community solidarity and stabilization fund, proposal on establishment of the ECOWAS exchange rate mechanism, harmonization of ECOWAS monetary policy framework, designation of the hosting country of the ECOWAS

Central Bank, and criteria for selection of qualified countries and launching of the ECOWAS Monetary Union. In addition to meeting the requirement of preparation and adoption of the monetary union's regulations and the statute of the CBWA, the legal committee mandated WAMA to conduct a study on, Size and Distribution of Capital of the proposed CBWA, and Reserve pooling for the optimal currency area (OCA). Proposal on these studies have been presented to the technical committee, observations were made and review is been done with a view to improving the quality of the documents. Furthermore, a revised version of the study on Determination of the Unit of Account of the eco is ongoing. It is been revised in line with the recommendations of the Committee of Governors.

The economies of the region have been hit hard due to Covid -19 pandemic. Many areas of socioeconomic activities have been severely disrupted. Lockdown measures imposed by governments to curb the spread of the disease disrupted production and supply chains for weeks. Most of

the affected businesses are small scale, which employ almost half of the workforce. The hospitality and airline industries are two of the sectors most affected by the pandemic. As cities go on lockdown and airports remain closed, hotels, restaurants, bars and nightclubs have become empty.

The deterioration in terms of compliance with the convergence criteria is likely to be most severe in the area of budget deficits. This projection is premised on significant revenue underperformance and increased health and social expenditures to mitigate the impact of the pandemic on the general population, especially the most vulnerable in society. Consequently, only Cabo Verde and The Gambia are projected to meet the budget deficit criterion in 2020.

Table 1: Number of Countries that Met the Convergence Criteria in ECOWAS (2016 2020)

	2016	2017	2018	2019	Pre-COVID 2020**	COVID 2020**
Primary Criteria						
Budget Deficit (Incl. Grants)/GDP	3	7	7	11	10	2
Inflation (annual average)	12	11	12	12	12	12
Gross External Reserves	12	13	13	13	14	12
Central Bank Budget Deficit Financing	11	13	10	13	14	11
Secondary Criteria						
Nominal Exchange Rate	11	13	14	14	13	14
Public Debt/GDP	12	12	12	13	13	12

Sources: National Authorities; WAMA   **Projections

To a lesser extent, the criteria on gross external reserves and central bank financing of deficit would also be negatively impacted given the expected slowdown in the traditional sources of foreign exchange and negative impact on the budget, respectively. As a result, twelve Member States are expected to meet the target on gross external reserves against fourteen in the initial projection while eleven Member States are expected to satisfy the target on central bank financing of the budget deficit, lower than the fourteen initially projected. While inflationary pressures are now expected to generally increase across the region, performance in terms of the number of countries meeting the target would remain unchanged at nine given the anticipated relative stability in the domestic currencies and some of the introduced administered prices instituted to combat the negative impact of the virus on society
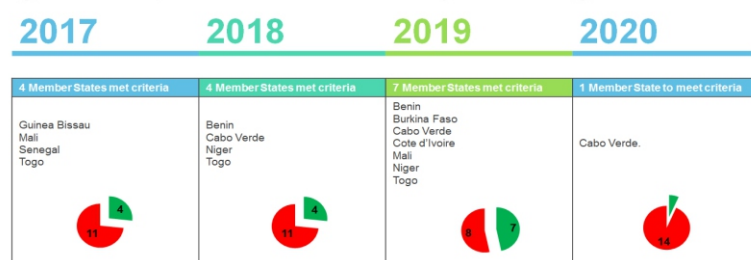
Convergence Deadline

Article 15 of the Supplementary Act provides that the deadline for macroeconomic convergence is 31st December, 2019. By that date, all Member States were expected to comply with all the primary criteria over the preceding three years 2017-2019. The performance of the Member States over that period is shown in Chart 3.

Article 16 of the Supplementary Act also provided for a Convergence Phase from 1 January 2016 to 31 December 2019. It provides that when a number of Member States have satisfied the primary criteria, the Community shall enter a Consolidation and Stability Phase. Thus, only one Member State was expected to comply with all the primary benchmarks by end 2020. Under these extraordinary circumstances, it is difficult to envisage how the region could enter into a Consolidation and Stability Phase.

Fig 2: Compliance with Primary Convergence Criteria

2017 — 4 Member States met criteria: Guinea Bissau, Mali, Senegal, Togo

2018 — 4 Member States met criteria: Benin, Cabo Verde, Niger, Togo

2019 — 7 Member States met criteria: Benin, Burkina Faso, Cabo Verde, Cote d'Ivoire, Mali, Niger, Togo

2020 — 1 Member State to meet criteria: Cabo Verde.

Conclusion

In these very uncertain macro-economic conditions, it is obviously difficult to predict what will happen next or how long the crisis will last. What is certain, however, is that the ECOWAS economy has been hit hard; with a potentially long-term effect. We must therefore expect to experience difficult periods in the coming months and work to restore economic stability in order to lay the basis for a durable monetary union.

We invite our readers to please read the next volumes of the WAMA Bulletin to keep up to date with the evolution of the Agency's work on the process of creation of the single currency of the ECOWAS region.

Training Session of the Research and Statistics Department of WAMA on   ." Global VAR Model Analysis of Shocks Spillovers   ." held November 16   – 20, 2020 at the WAMA Conference Room

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The West African Monetary Agency (WAMA), Freetown, Sierra Leone, organized a 5-day special training on "Global VAR Model Analysis of Shocks Spillovers." The training, which was declared open by the Director-General (DG), WAMA, Momodou B. SAHO, was held at the Agency's Conference Room from November 16 – 20, 2020. A total of fourteen (14) participated in the training including staff of WAMA, Sierra Leone Ministry of Finance, and the Bank of Sierra Leone.

In his opening remarks, the DG welcomed participants and urged them to actively participate in the training so as to acquire new skills that would advance their intellectual capacity and enhance their productivity and deliverables. He added that the participants should also seize the forum as an opportunity to maximize their interactions with the resource person and fellow participants to build a strong network of academic excellence.

The training was facilitated by Professor **Afees A. Salisu -** the

IN-HOUSE TRAINING PROGRAMME ON GLOBAL VAR MODEL ANALYSIS OF SHOCKS SPILLOVERS FREETOWN, SIERRA LEONE NOVEMBER 16-20, 2020

Director, Centre for Econometric & Allied Research (CEAR), University of Ibadan. Nigeria. The course's overall objective was to expose participants to new skills in analyzing shock spillovers using the novel GVAR model and technique. To this end, participants were expected at the end of the course to be able to:

- Specify and estimate GVAR models;

- Perform relevant diagnostic tests;

- Interpret results; and

Apply them in policy formulations.

Given the above, a simplistic approach was adopted in accomplishing the set objectives. It commenced with a refresher session on multivariate models, causality, impulse response functions (IRFs), and forecast error variance decompositions (FEVD). Following that was an in-depth, hands-on GVAR session and its application in solving economic distortions.

Towards the end of the training, participants became reasonably

proficient in GVAR analysis. Remarkably, with a promise to render technical support, the facilitator coordinated participants to conduct studies in three (3) groups to be published in reputable academic journals. Studies-in-progress by the participants are:

- Global geopolitical risks and macroeconomic volatility of emerging economies in Africa: A Global VAR analysis;

- Pandemics and macroeconomic volatility of emerging economies in

Africa: A Global VAR analysis; and

Global economic uncertainty and macroeconomic volatility of emerging economies in Africa: A Global VAR analysis.

The training came to a close with the issuance of certificates , which were distributed by the Director General of WAMA. Participants expressed appreciation to the Management of WAMA for the opportunity to foster knowledge among professional staff and provide re-

sourceful skills that would improve their productivity in meeting the Agency's mandates. The Director of Research and Statistics (DRS) of WAMA, Dr. Abdulsalam, thanked Prof. Salisu for the excellent presentations and facilitation during the training on behalf of Management. He also solicited his continuous support in furthering intellectual capacity at WAMA.

Training Session of the Research and Statistics Department of WAMA on " Econometric modeling and Forecasting." held February 17–21, 2020 at the WAMA Conference Room

The West African Monetary Agency (WAMA) organized a specialized training on Econometric Modelling and Forecasting at the Agency's Conference Room, from February 17 – 21, 2020. The training was declared open by the Director-General of WAMA, Momodou B. SAHO, who welcomed the participants and urged them to fully and meaningfully participate in the training programme.

The main objective of the training was to enhance the participants' research skills in econometric modelling and forecasting for policy analysis. The training was attended by eight (08) technical officials from WAMA and two (02) economists from Bank of Sierra Leone,

The Training was delivered by **Afees A. Salisu PhD,** University Professor and Doctoral Advisor, Senior Research Fellow, Centre for Econometric & Allied Research, University of Ibadan. Nigeria.

At the end of the training, participants were able to deal with Stata Software on panel data econometrics for policy analysis:

The following themes were treated:

General introduction of Panel data econometrics;

Static panel analyses: Preparing panel datasets, specification and estimation of

pooled reregression, fixed effects model and random effects model;

Testing for fixed effects and random effects. Choosing between fixed effects and random effects. Robustness tests.

Dynamic panel data analyses (short Panel): Static vs Dynamic panels, specification and estimation of Difference GMM;

Dealing with endogeneity bias and autocorrelation in dynamic panels. Diagnostic tests;

Nonstationary and heterogeneous panel (Long pan-

els): Panel unit root and cointegration tests;

Panel Autoregression Distributed Lag Model: Specification and Estimation issues (Pooled Mean Group and Mean Group estimators) I & II;

Dealing with nonlinearity and asymmetry in Nonstationary and Heterogenous panels: Panels Nonlinear ARDL Model I & II.

The participants expressed gratitude to the Management of WAMA and the Department of Research and Statistics for its continuous effort in enhancing the human resource capacity by organizing such an invaluable train-

ing. They emphasized that the knowledge and skills acquired during this training will improve job performance. The Chief Internal Auditor, Abdoulie CEESAY, on behalf of the Director General, expressed his gratitude to Prof. Salisu, for the excellent delivery during the training.

TRAINING PROGRAMME ON "ECONOMETRIC MODELLING WITH PANEL DATA" FREETOWN, SIERRA LEONE. ON 17TH - 21ST FEBRUARY, 2020.

Central Banking under Monetary Union Arrangement:

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Central banking is generally viewed as a process where an institution is responsible for the control of money supply through issuance of currency and setting of interest rates on loans; regulation of other banks by prescribing prudential limits and acting as

lender of last resort to banks, other credit institutions and governments. In Europe, central banking used to represent issuance and management of national currencies but evolved to include the conduct of monetary policy as an essential part of economic policies (Scheller, 2004). Recent crises showed the weaknesses in

basing central banking on monetary stability. In view of changed conditions from the crises, it is emphasized that central banking in the twenty one century should recognize interdependence among monetary stability, financial stability and economic stability as well as include policy measures in which goals may be

addressed (Dow, 2017). Under monetary union arrangement, a central bank is a common monetary authority for member countries which carries out central banking functions as mandated in the statute, for example European Central Bank (ECB) for the European Union and Central Bank of West African States (BCEAO) for the UEMOA countries. In this situation, national central banks of member countries operate as branches that carry out monetary policy operations of the regional central bank.

Taylor rule has advanced the practice of central banking. Several versions of Taylor rule have been used by policymakers at central banks. However Greenspan argued that Taylor rule might be preferable if future would be like the past but unfortunately this is not always true. So, a substantial degree of discretion is necessary so as to deal with shocks that are unfamiliar (Asso, Kahn and Leeson, 2010). ECB under monetary union arrangement views the usefulness of Taylor rule with some degree of reservation because price stability is the primary goal of the Bank.

The Bank of England and Swe-dish Riksbank, were the first prototypes of modern central banks which date back to 17th century. The Bank of England started operation in 1694 with the recognition of the role of lender of last resort. The earliest known Bank of Issue was the Riksbank of Sweden in 1656. In the United States, the USA Congress established first Bank of America in 1791 and the second Bank of America in 1816. The present Federal Reserve System was established to offer central banking operations in 1913. At the global level, Bank of International Settlement (BIS) started in 1930 and commenced central banking cooperation in 1931. Central bank cooperation comprises exchange of expertise, sharing of best practices as well as contributions to capacity-building. The IMF and the World Bank collaborate on the Financial Sector Assessment Programme (FSAP) and poverty reduction programmes. Specifically, the IMF liaises with central banks and fiscal authorities on macroeconomic management through financial and non-financial (policy) support.Thus, it is important for countries under monetary union agenda to put in place arrangements for the establishment of a common central bank in preparation for transition to a common currency. The common central bank would be required to conduct monetary policy for all member countries. National central banks under this arrangement are expected to ensure harmonization of monetary policy framework, exchange rate regimes and regulations of the financial system. It may be pertinent to have monetary institute to lead the creation of common central bank and common currency in ECOWAS as recommended by Paul a leading expert in monetary integration (Durevall, Newlarmer and Soderbon 2011).

2. Establishment of European Central Bank (ECB)

The structure of the ECB was outlined in the Maastricht Treaty (1992) as part of the programme to create Economic and Monetary Union (EMU). The Treaty of Amsterdam established the European Central Bank (ECB) in 1998, which started operations in 1999 and issued euro as a single currency in 2002 at its Headquarter in Frankfurt, Germany. The 1992 Treaty set up the European System of Central Banks (ESCB) and a European Monetary Institute (EMI). At this point the EMI was closed and the ECB took over its

responsibilities. The Lisbon Treaty (2007) formally established the ECB as an EU institution (James, 2015). The main responsibility of the ECB is the conduct of monetary policy for the euro area since 1999 to maintain the euro's purchasing power and price stability. In June 2011, Italian Mario Draghi was voted in to be the next President of the ECB for the period November 2011 to October 2019. The ESCB consists of the ECB and the national central banks of all EU Member States whether they have adopted the euro or not. The ECB also has relations with non-Eurozone EU members through the General Council, which brings together the President, Vice-President and the heads of the central banks of all EU member states. However, non-eurozone members are still free to set their own currencies and monetary policy, the ECB does not have the same influence over them.

Specifically, the ECB performs central banking functions on behalf of the 19 EU member states but the capital was contributed by 28 central banks of all EU Member states that form the ECB General Council Membership. The ECB key functions as mandated in the statute are:

Maintenance of price stability in Euro zone

Definition and implementation of monetary policy for the Euro zone

Conduct of foreign exchange operations and management of external reserves

Management of financial market infrastructure including payments systems; and

Exclusive power to issue euro banknotes, however, member states can issue coins but the amount should be approved by the ECB

The definition and method of measuring compliance with convergence criteria for European Monetary Union was developed by the EMI (later known as ECB) in its first three reports published in April 1995, November 1995 and November 1996. The five criteria identified include:

I.   Harmonized index of consumer prices (12-months average of yearly rates). This is *the* unweighted arithmetic average of the similar HICP inflation rates in the 3 EU member states with the lowest HICP inflation plus 1.5 percentage points.

II. Government Budget Deficit: This measures the ratio of the annual general government deficit compared to gross domestic product (GDP) at market prices, which must not exceed 3% at the end of the preceding fiscal year.

III. Government Debt to GDP Ratio: The ratio of gross government debt is evaluated against the nominal GDP at market prices which must not exceed the 60 per cent at the end of the year.

IV. Exchange rate stability: Joining countries should have stable exchange rate without "severe tensions". Participation in ERM1/ERM11 for two years was expected.

Long term interest rates should not be more than 2 percentage points higher than the unweighted arithmetic average of the similar 10-year government bond yields in the 3 EU member states with the lowest HICP inflation.
The ECB publishes a Convergence Report at least every two years to check how well the EU members aspiring for euro adoption comply with the criteria. The first full convergence report was published in November 1996, and concluded that only 3 out of 15 EU member states (Denmark, Luxembourg and Ireland) were completely compliant with the criteria at that point in time. As a

majority of states were not in compliance, the Council decided to delay the introduction of the euro by two years to 1 January 1999. In March 1998 a more positive second convergence report concluded that 11 out of 12 applying countries were prepared for the electronic introduction of the euro on 1 January 1999, with only Greece failing to qualify by the deadline. Subsequent convergence reports resulted in an additional 8 EU member states complying with all criteria and adopting the euro (Greece, Slovenia, Cyprus, Malta, Slovakia, Estonia, Latvia and Lithuania). The latest convergence report was published in June 2014, and checked for compliance in the reference year from May 2012 – April 2014, where Lithuania managed to fully comply and became the next 19th eurozone member. Member countries had the right to ask the ECB for an updated compliance check, if they believe they have met all both economic and legal convergence criteria. For instance, Latvia requested for such an extraordinary compliance check in March 2013 instead of the 2 year interval for automatic assessments.

Support by ECB for the Accession of National Central Banks to EU

The ECB and 21 national central banks (2011-2013) supported the National Bank of Serbia in preparation for the Republic of Serbia's accession to the EU. The 35-month programme covered 13 central banking areas that a deemed important including i) financial sector supervision; ii) legal harmonization; iii) liberalization of capital movements; iv) foreign exchange reserve management; v) monetary and exchange rate operations; vi) financial services consumer protection; vii) EU accession support; viii) economic analysis and research; ix) statistics; x) payments systems; xi) financial system stability; xii) information technology; and xiii) accounting and financial reporting.

In the same vein, ECB and 10 national central banks collaborated to assist the National Bank of the Republic of Macedonia (NBRM) (2012-2013). 10 specific areas identified for the bank to make progress to be compatible with any central bank of an EU Member State are i) accounting; ii) banknotes; iii) economic analysis and research; iv) human resources; v) information technology; vi) internal audit; vii) legal services; viii) monetary and exchange rate policy; ix) payments systems; and x) statistics. The prescribed level is expected to be reached by the time the country becomes an EU Member State.

The ECB in April 2014 launched an Eurosystem Cooperation Programme with the Bank of Albania (BoA), the Central Bank of the Republic of Kosovo (CBRK) and the National Bank of the Montenegro (Sept 2014) to join the ECB. The European Union (EU) has allocated €500,000 to the programme from its Instrument for Pre-Accession Assistance. The identified areas of priority for support from ECB and other national central banks signifies the relevance of such areas in the process of establishing a regional central bank for any proposed monetary union.

Lesson for ECOWAS Member Countries

Paul (Durevall, Newlarmer and Soderbon 2011) a leading expert in monetary integration recommends that there should be a well-functioning supranational institutional structure in place to establish and operate a monetary

union such as the European Monetary Institute (EMI) later transformed to the ECB. In this regard, it is desirable for the ECOWAS to delegate key issues on the formation of monetary union and introduction of single currency to any of its institutions to serve as ECOWAS Monetary Institute and later become the common central bank for the member countries.

In a bid to benefit from the experience of the European Union, ECOWAS is expected to create ECOWAS Monetary Institute (EMI), which would put in place necessary conditions for a smooth transition to the new common currency. This should be a deliberate decision to facilitate the establishment of a common ECOWAS Central Bank (ECB) that would issue the new common currency and conduct monetary policy for ECOWAS member countries.

In view of the role played by the European Monetary Institute in the formation of European Monetary Union, the proposed ECOWAS Monetary Institute is expected to perform the following functions (WAMA, 2015):

i.   present a platform for close cooperation among the eight Central Banks in the ECOWAS region and facilitate the establishment of

common central bank for ECOWAS Member States;

ii.   Regularly examine the status of compliance with convergence criteria by the member countries. The Convergence Reports are expected to provide input for policy decision to achieve convergence of the participating economies;

iii. commence preparatory steps required for the issuance of the single currency by the ECOWAS Central Bank;

iv.   To be responsible for drawing up guidelines for the acquisition of a building that will house the ECOWAS Central Bank including the recruitment of staff;

v.   Ensure that regulations in all countries are consistent with the introduction of the new currency; and

Create awareness for citizens of Member States to support the introduction of a new single currency. This could be done by organizing seminars, workshops, etc to educate the public on the new currency and benefit of common central bank.

ECOWAS and prospective ECOWAS Monetary Institute should pay special attention to key central banking areas identified by the ECB for accession of national central banks to EU such as eco-

nomic analysis, currency operation, monetary and foreign exchange policies, foreign exchange management, payments system and statistics; among others.

Another Important lesson for ECOWAS is that it should not insist that until all member countries meet the convergence criteria before the formation of the monetary union. Immediately a good number of key countries are able to comply, it could go ahead and admit other non-qualifying members of the monetary union when they qualify. Thus, as these countries meet the convergence criteria they could invite the ECOWAS Central Bank to carry out compliance check for possible admission.

Conclusion

It is clear that central banks play very important role in nation building through the provision of credible and reliable payments system and stable macroeconomic environment. They formulate and implement appropriate monetary policy to achieve predetermined policy objectives. However, under monetary union arrangement, member countries must be prepared to lose monetary policy independence as national central banks only implement monetary policy of the common central

bank. This situation has been traced to policy options available according to the Mundell-Fleming unholy trinity model.

In accordance with the view of Paul (Durevall, Newlarmer and Soderbon 2011) a leading expert in monetary integration, it is now desirable that a supranational institution be established to handle the process of monetary union in ECOWAS. This calls for the appropriate authorities to approve the setting up of ECOWAS Monetary Institute (EMI) to facilitate the process of monetary integration leading to the introduction of single currency.

In conclusion, ECOWAS should not wait until all member countries comply with convergence criteria to start the monetary union and introduce single currency. It should start with those members that are ready and others to join later. It is also obvious that an efficient and effective common central bank is required to strengthen economic integration that will produce strong and resilient macroeconomic environment in ECOWAS member states.

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PREDICTING AND FORECASTING OPTIMUM CURRENCY AREA (OCA) INDICES FOR ECOWAS

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Introduction

The type of convergence mainly emphasized in the criteria for monetary integration of ECOWAS is the convergence of nominal variables such as inflation, public debt and interest rates. However, the real convergence in terms of per capita income and productivity are equally important and cannot be over-emphasized. Empirical evidence premised on the theory of Optimal Currency Area (OCA) lends credence to the necessity of having and meeting not only the nominal convergence but also the real convergence before entry into a monetary union. OCA theory mainly focuses on the characteristics which make monetary union desirable and exchange rate stable. Following the approach used in (Bayoumi & Eichengreen, 1997), the OCA theory is operationalized for ECOWAS member states by analyzing the determinants of exchange rate variability.

We evaluate the evidence on real convergence following the theory of Optimal Currency Area (OCA), which focuses on the characteristics which make monetary union desirable and exchange rate stable, as a prerequisite for ECOWAS monetary union (Bayoumi & Eichengreen, 1997). We extend the previous

$$exch_{ij,t} = \alpha + \beta growth_{ij,t} + \phi bitrade_{ij,t} + \lambda comtrade_{ij,t} + \delta size_{ij,t} + \varepsilon_t$$

$$\forall i \neq j; \quad i = 1,...,n;$$

report on the optimality of OCA among ECOWAS Member States by evaluating the underlying characteristics which guarantee their exchange rate stability and monetary union desirability. For ease of reference, the underlying OCA regression equation is represented below:

where $exch$ represents variability in exchange rate across countries and it is measured as the standard deviation of the logarithmic changes in the end-of-year bilateral exchange rate between countries i and j; i and j represents each of the country in n - number of countries within the regional economic bloc, and in this case the fifteen ECOWAS Member States. $growth$ denotes the economic output disturbances and it is calculated as the standard deviation of the change in the natural log of real output between the two countries; $bitrade$ is the average value of bilateral exports to partner country scaled by their respective GDP and it is included to account for the importance of trade linkages among the countries. $contrade$ accounts for the dissimilarity of commodity composition of the two countries and it is measured as the sum of absolute differences in the shares of primary and secondary products (agriculture, mining and extraction, and manufacturing) in the total countries' merchandise trade; $size$ is the simple average of the logarithm of the two countries' GDP and it is included in the model as a measure of more stable currency.

The variability of exchange rates is evaluated using the real exchange rate behavior of these countries for two reasons. First, the real exchange rate conveys more information underlying economic attributes than the nominal exchange rate. For example, information on price situation in the different economies under investigation is accommodated in the real measure of exchange rate. In addition, eight among the 15 ECOWAS Members currently operate a similar currency – the West African CFA Franc. Hence, evaluating the exchange rate in nominal terms will assume uniformity of exchanges for all the countries, when in fact their economic fundamentals such as inflation and growth in per capita GDP are distinct.1

We extract annual data between 1990 and 2019 for each of the series used in the computation of relevant variables specified in the above equation. Data including bilateral exchange rate and gross domestic product were extracted from West African Monetary Institution's (WAMI) statistical database. While data on bilateral exports and merchandise trade for each of the 15 ECOWAS countries were collected from the IMF's Direction of Trade Statistics (DOTS) database.

The estimated regression equation is summarized in Table 1. Similar to the estimated results in the last report, all the explanatory variables considered in the regression equation have the expected signs and are statistically significant at 1 percent level. Hence, the result could also be taken as a support for the empirical implications of the theory of OCA.

1 The empirical results between estimation using the nominal and real exchange rate are found to be quite similar by (Bayoumi & Eichengreen, 1997).

Table 1:   **OCA Regression Equation Estimates**

Variable	Coefficient	Std. Error	Probability
Constant	2.5617	0.1856	0.0000***
Growth	0.3239	0.1184	0.0063***
Comtrade	0.1144	0.0314	0.003***
Bitrade	-0.5902	0.2070	0.0044***
Size	-0.1864	0.0181	0.0000***
R-Squared	0.048	Std. Err.	0.4985
No. of Obs. (T×N)	29×105		

Note: *** indicates statistical significance at 1% level; T indicates the number of time periods; N is the number of cross sections and it indicates the different variables combinations between pairs of country i and country j. Std. Err. Indicates the standard error of the estimated regression.

Predicting and Forecasting OCA Indices

The structural characteristics of the exchange rate behavior may be unstable over time and therefore the out of sample forecasting may be problematic. Here, we extend the regression estimation to forecast the successive values using actual data for 2013, 2015, 2017 and 2019. We employ the regression estimates from equation 1 to project the OCA index for the immediate succeeding periods. Overall, the estimation results are quite stable for both relative output and bilateral trade relations. To forecast the dependent variable between 2020 and 2022, we constructed the projections of the independent variables using extrapolation of annual moving averages.

In Table 1, we report the baseline OCA Indices for the ECO-WAS Member Countries which are computed as pairs of bilateral rates against Nigeria using actual data and projected series. The first panel of the table (Panel A) comprises OCA indices for four-year periods based on actual data: 2013, 2015, 2017, and 2019. On the other hand, indices in Panel B are estimated using projected values of the independent variables for the years 2020, 2021 and 2022. The plot of the projected OCA indices is illustrated in Figure 2 and it reveals non-convergence of the countries' bilateral rates against Nigeria. All the countries have indi-ces greater than 0.4985.

The plots of the OCA Indices are also plotted using actual data for the three most recent periods in Figure 1. In all cases for each of the ECOWAS countries, the results suggest convergence for all the countries towards a monetary union. The level of convergence for Cape Verde, Gambia and Guinea-Bissau for the three-periods comprising 2015, 2017 and 2019 as plotted on the graph show less convergence compared to the other ECOWAS countries. The difference in the values of the OCA index across the countries reflects the differences in the relative economic size of countries across the region as well as the different levels of bilateral trade among the countries, as compared to trade with other countries outside the ECOWAS regional bloc.

2 The OCA indices are compared for bilateral rates against Nigeria because the country has the largest economy, and it is a core member of ECOWAS to which other members may need to converge.
3 0.4985 represents one standard error for the regression over the entire sample.

Table 2: OCA Indices vis-à-vis Nigeria, current and projected values

Period	ben	bfa	Civ	Cpv	gha	gin	gmb	gnb	Lbr	mli	ner	sen	Sle	tgo
Panel A														
2013	0.041	0.607	-0.033	4.662	1.001	0.388	2.262	2.383	0.819	1.254	0.019	1.030	0.258	0.583
2015	0.061	0.549	-0.102	4.518	0.949	0.384	2.224	2.255	0.605	1.225	0.002	1.149	0.296	0.591
2017	0.055	0.639	-0.073	4.464	0.903	0.376	2.291	2.313	0.719	1.193	-0.002	1.122	0.314	0.660
2019	0.041	0.751	-0.053	4.400	0.847	0.366	2.281	2.418	0.828	1.133	0.110	1.091	0.355	0.815
Panel B														
2020	0.045	0.795	-0.039	4.384	0.842	0.378	2.323	2.476	0.444	1.118	0.222	1.111	0.368	0.884
2021	0.045	0.793	-0.034	4.387	0.855	0.394	2.326	2.516	0.004	1.115	0.342	1.120	0.369	0.928
2022	0.044	0.792	-0.029	4.390	0.868	0.409	2.329	2.557	-0.436	1.112	0.463	1.130	0.370	0.971

Figure 1: OCA Indices - Current Convergence vis-à-vis Nigeria (2015 – 2019)
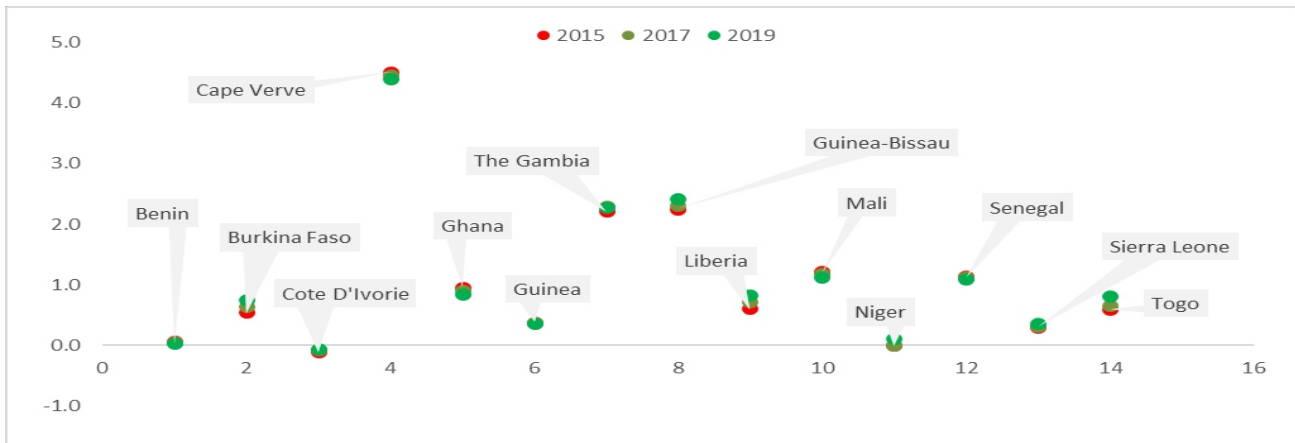
Figure 2: OCA Indices – Projected Convergence (2020 – 2022)
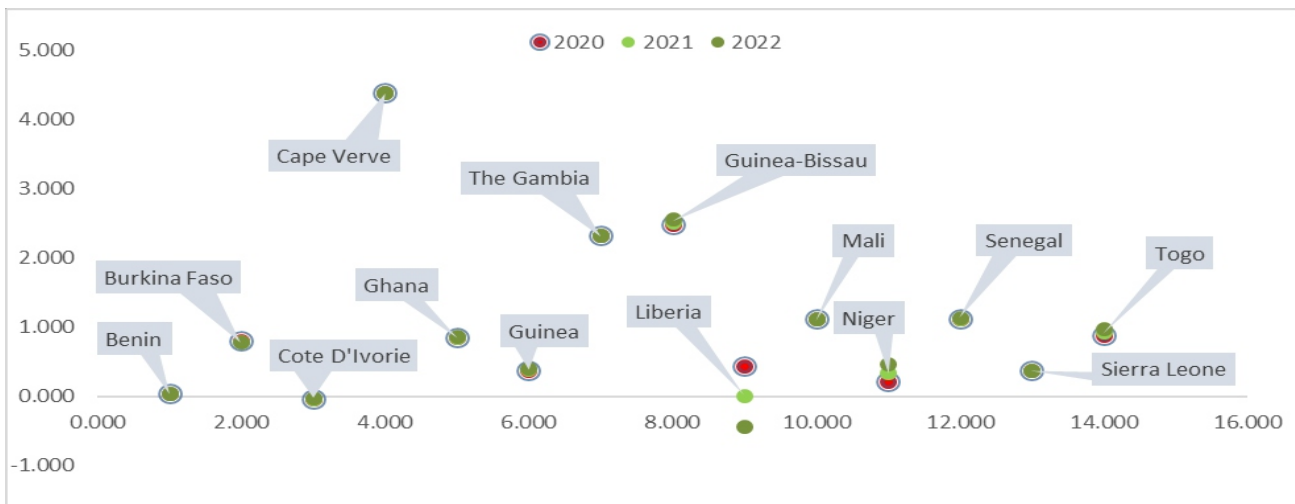
The preceding analysis focuses on the structural relationships of ECOWAS Members vis-à-vis Nigeria. The results reveal non-convergence of the countries. However, for robustness and to explore other discerning issues related to the monetary integration of the region, we analyze other bilateral relationships using another country as the reference country. We use Cote D'Ivoire which has the largest economic output among the West African Economic and Monetary Union (WAEMU) countries. The OCA Indices vis-à-vis Cote D'Ivoire are summarized in Table 3 and plotted in Figures 3 and 4 respectively for historical and projected OCA indices.

Table 3: OCA Indices vis-à-vis Cote D'Ivoire, current and projected values

	2013	2015	2017	2019	2020	2021	2022
Benin	-0.1597	-0.1038	-0.1359	-0.1329	-0.1247	-0.1256	-0.1264
Burkina Faso	0.6420	0.7067	0.6607	0.6587	0.6640	0.6611	0.6581
Cape Verve	0.7624	0.7418	0.6379	0.6060	0.5934	0.5960	0.5986
Ghana	1.5799	1.6005	1.5534	1.4884	1.4620	1.4481	1.4341
Guinea	0.0505	0.0600	0.0239	0.0060	-0.0110	-0.0319	-0.0528
Guinea-Bissau	-0.1394	-0.1046	-0.1498	-0.1520	-0.1542	-0.1657	-0.1772
Liberia	0.4338	0.5005	0.2184	0.3159	0.1191	-0.0804	-0.2799
Mali	0.8233	0.8171	0.7336	0.6361	0.6035	0.5839	0.5643
Niger	0.4422	0.5559	0.5639	0.6161	0.6495	0.6428	0.6361
Nigeria	-0.2240	-0.1639	-0.1475	-0.1857	-0.2142	-0.2517	-0.2891
Senegal	0.6781	0.7274	0.6911	0.7009	0.6981	0.6862	0.6742
Sierra Leone	2.9979	2.9425	2.8106	2.7069	2.6640	2.6801	2.6962
The Gambia	1.0855	1.0987	1.0321	0.9567	0.9464	0.9468	0.9473
Togo	1.1899	1.3310	1.4015	1.5015	1.5460	1.5420	1.5380

Figure 3: OCA Indices - Current Convergence vis-à-vis Cote D'Ivoire (2015 – 2019)
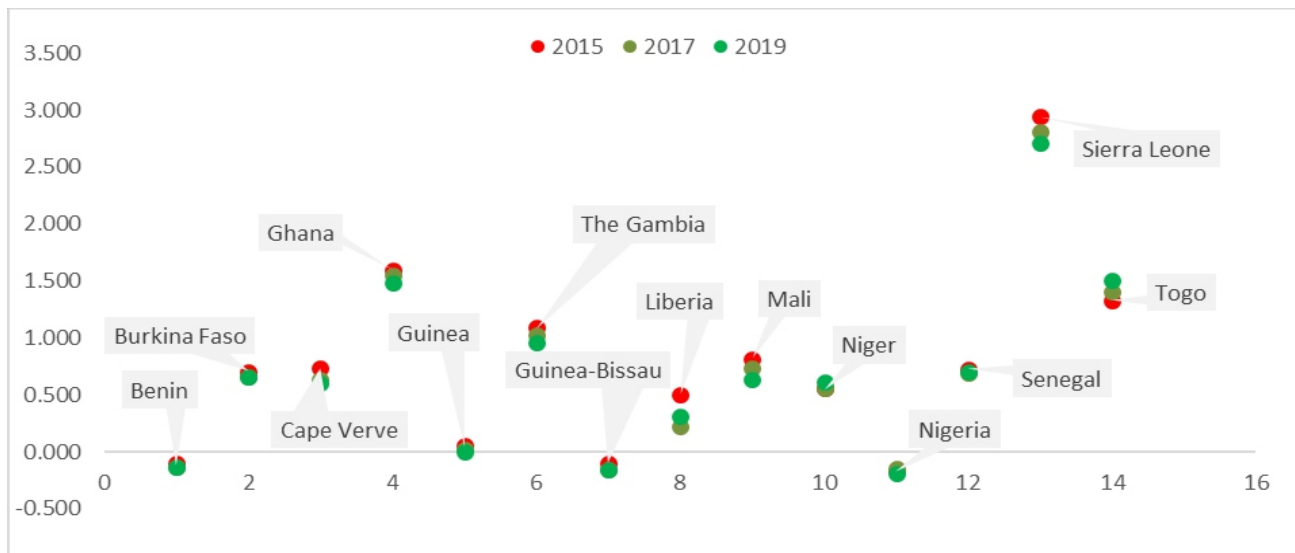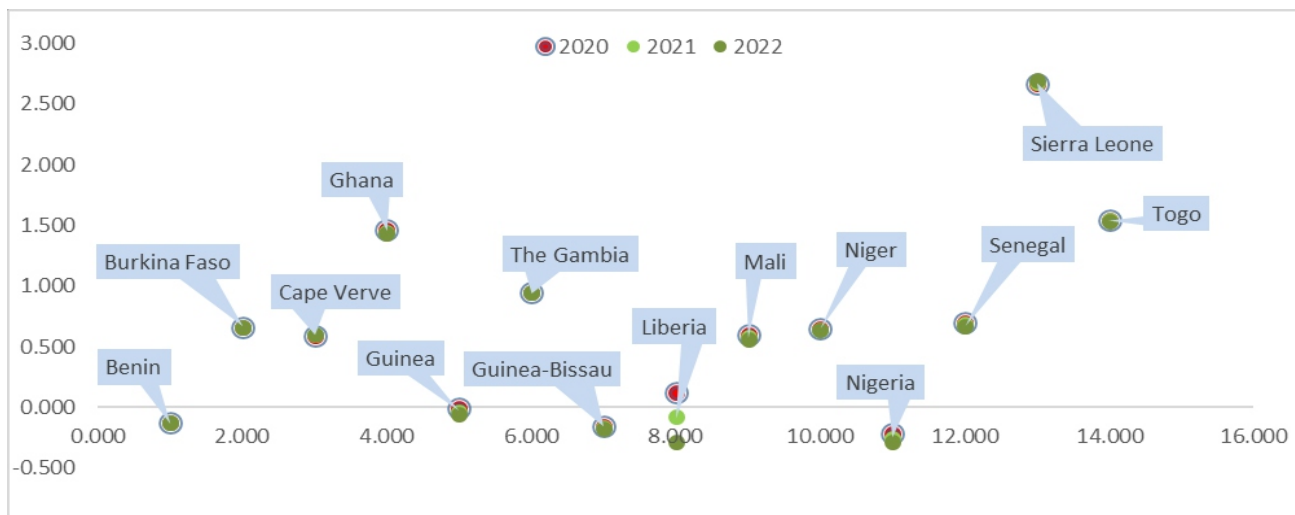

Figure 4: OCA Indices –Convergence Projections [Cote D'Ivoire] (2020 – 2022)

SIGMA CONVERGENCE ANALYSIS FOR ECOWAS

INTRODUCTION

To better understand the macroeconomic convergence of ECOWAS countries, we can use other convergence measures, including the analysis of the dispersion of relevant macroeconomic indicators. Drawing on the concept of the sigma-convergence challenge by Sala-i-Martin's (1996), it is possible to measure the convergence or divergence of economies in relation to each convergence criterion. Exchange rate variability is also used by some experts in the OCA theory to measure convergence.

METHOD

The notion of convergence sigma is characterized by a measure of the standard deviation based on the convergence criteria. Analytically, the sigma convergence is defined as follows:

$$\sigma_t(C) = \sqrt{\sum_{i=1}^{n} \frac{\left(C_{ti} - \bar{C}_t\right)^2}{n}}$$

where C_{ti} represents the value of the convergence criterion C_t for a given country i, $\bar{C}_t$ the average value of the criterion for a given period t and n the number of countries . This expression implies that the sigma convergence is assessed in relation to each convergence criterion and the periods. Thus, for two periods or two years t and $t+h$, there is sigma convergence when

$$\sigma_t(C) > \sigma_{t+h}(C)$$

. It is preferable in practice to use the coefficient of variation defined by:

$$CV = \frac{\sigma_t(C)}{\bar{C}_t}$$

. A downward trend in the coefficient over a given period indicates a convergence sigma over the period. A relatively low coefficient indicates a homogeneity of economies; synonymous with convergence. To highlight this fact, a graphical representation or a simple linear regression overtime is generally used. A negative sign of the coefficient indicates a sigma-convergence. The application of the method to the convergence criteria produces the results shown in the graphs in the annex.

It should be noted that the sigma-convergence statistic evolves downwards as well as the coefficient of variation, which shows a downward trend. This indicates a sigma-convergence of economies. However, it should be noted that this evolution varies according to the criteria and periods.

MAIN FINDINGS

In general, the downward trend is observed from 2007 onwards with the budget deficit criterion. In particular, from 2012 onwards, the statistic decreases significantly by indicating a reduction in the dispersion observed between economies and convergence towards an average value of this indicator since the coefficient of variation is less than one. With regards to the second primary criterion (inflation), the evolution of the statistics is mixed. It appears that the coefficient of variation is higher than the values obtained for the budget deficit, which implies that, compared to this criterion, the economies converge less. This result is similar to that of the criterion on central bank financing of the budget deficit. Indeed, a majority of countries no longer use the central bank to finance the budget deficit. This is the case for WAEMU countries that have not used central bank financing since 2003, while some countries have used it a few times. Therefore, the sigma-convergence measured by the coefficient of variation indicates a fairly moderate degree of convergence.

On the other hand, the economies converge much more closely on the foreign exchange reserve criterion because the calculated coefficient is very low and well below the values obtained for the other primary criteria. This result is explained by the fact that many countries comply with this criterion, particularly the WAEMU economies as a whole and Nigeria, which has quite huge foreign exchange reserves. As can be seen on the bar graph, the value of the coefficient decreases but with a slight dispersion observed.

This divergence is due to the fact that Nigeria's foreign exchange reserves increased significantly in 2017 and 2018, creating a disparity.
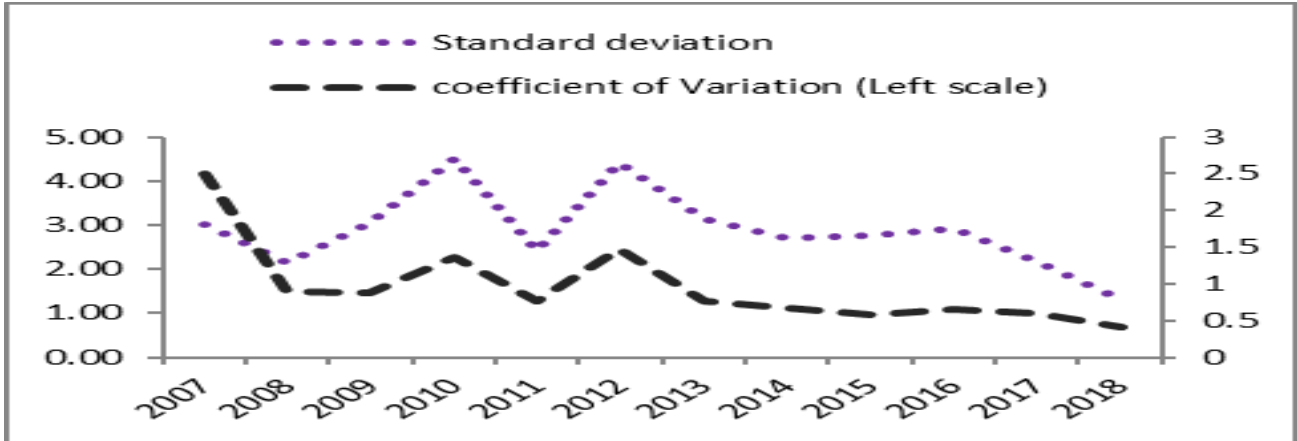
Figure 3.6 :Budget deficit grants included as %GDP

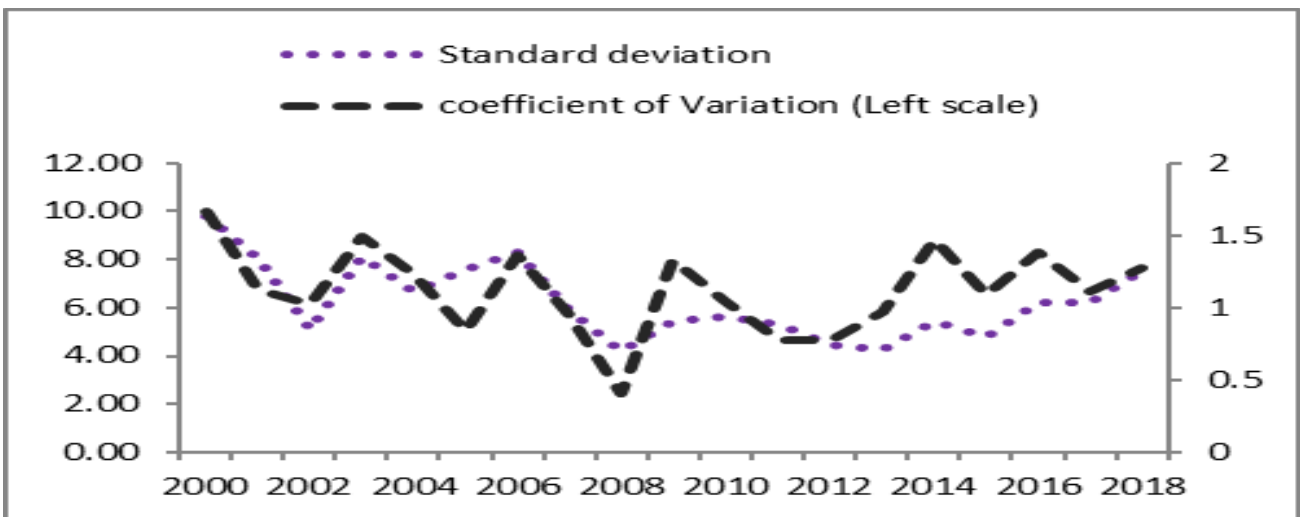

Figure 3.7:Average inflation
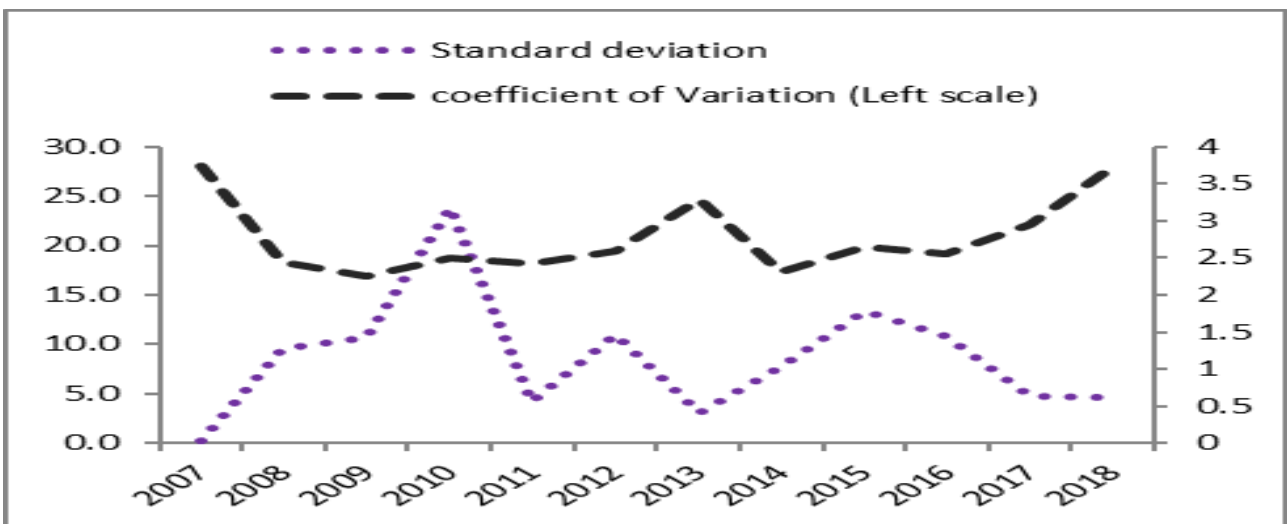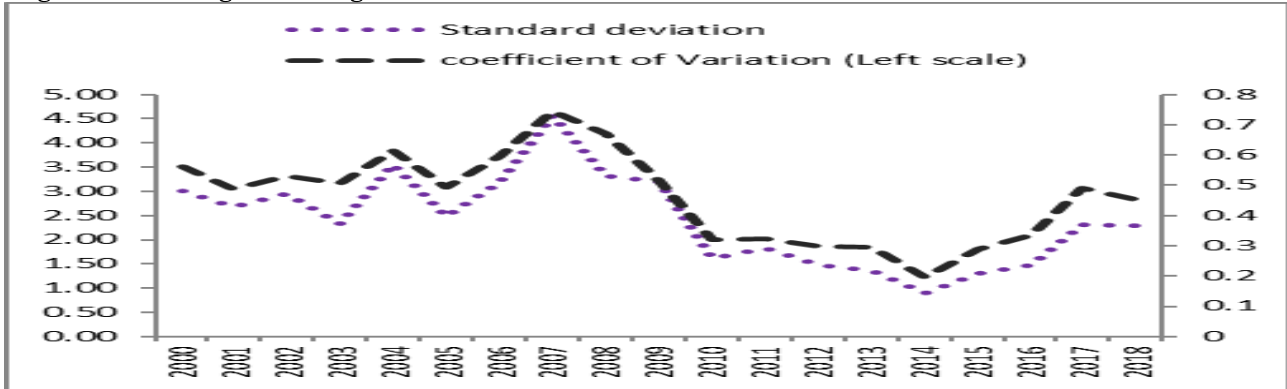

Figure 3. 8: Financing the budget deficit

Figure 3.9: Foreign Exchange reserves

With regard to the secondary criteria, the economies converge much more closely in relation to the debt ratio. As indicated by the evolution of the statistics on sigma-convergence and the variation coefficient, almost all the economies record debt ratios below the threshold of 70% of GDP by focusing much more on average values around 50% of GDP.

On the other hand, the sigma-convergence indicates a deviation from the criterion on nominal exchange rate stability, whose variation coefficient has increased significantly over the past three years. This dispersion is the result of a sharp depreciation of the Cedi, Liberian Dollar, Naira and Leone between 2016 and 2018; the other currencies have remained relatively stable.

In view of the countries' performance in terms of public debt, it is important to note that the 70% ceiling, which was met by 12 out of 15 countries outside Cabo Verde, Gambia and Togo, seems to be more in line with the sole objective of public debt sustainability without taking into account the conditions of state debt. Although countries that met this criterion have debt margins, it appears that public debt service, particularly interest, increases disproportionately with the evolution of government tax revenues, thus compromising the margins for financing capital expenditure that is conducive to economic growth. Thus, in some States, interest on debt has more than doubled, particularly interest on the domestic debt contracted at fairly high interest rates.

Figure 3.10:Nominal exchange rate stability
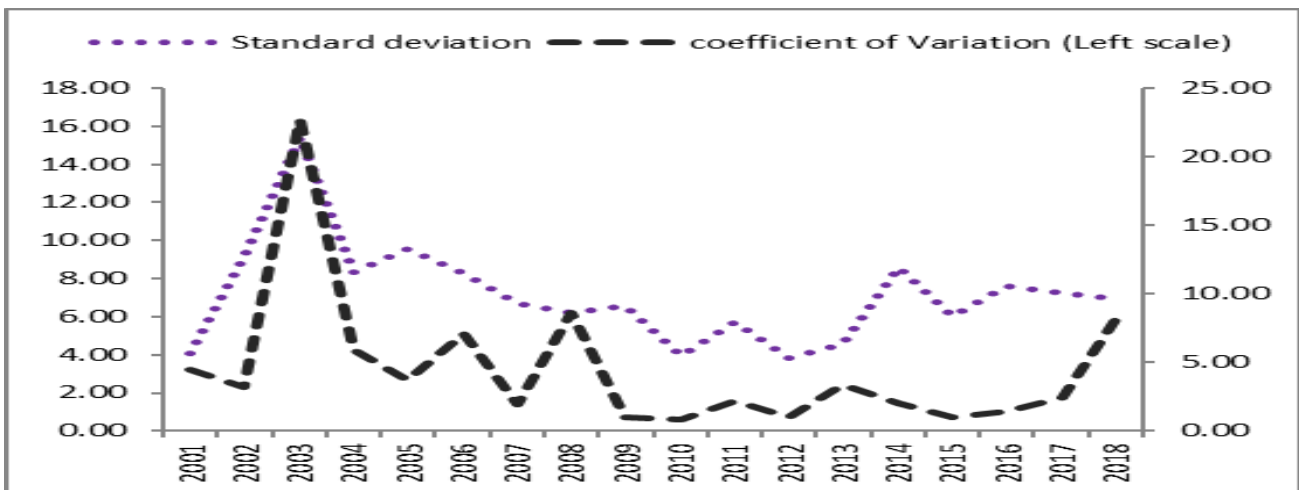
Based on performance, the economies have not achieved convergence towards the defined targets. However, there is convergence in terms of reducing dispersion between economies on the one hand and reducing gaps in convergence targets for most convergence criteria on the other. It can be noted, for example, that in terms of fiscal deficit, the unweighted average has fallen considerably and is slightly above the convergence target, while the standard deviation of the dispersion also declined in 2017 and 2018 (Figure 3.12).

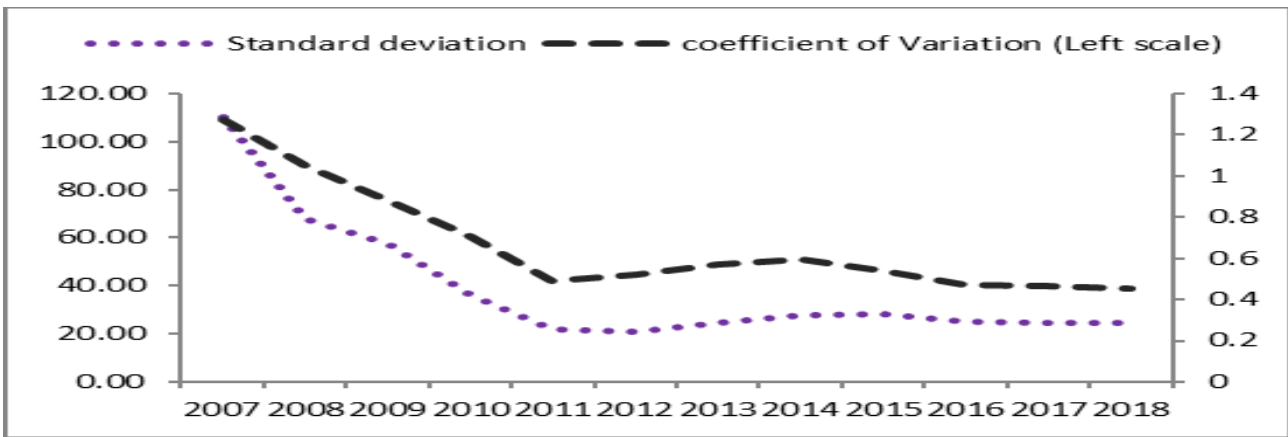**Figure 3.11: Public debt ratio as a % of GDP**

Figure 3.12: Public debt ratio Evolution of the sigma-convergence of three primary criteria as a % of GDP
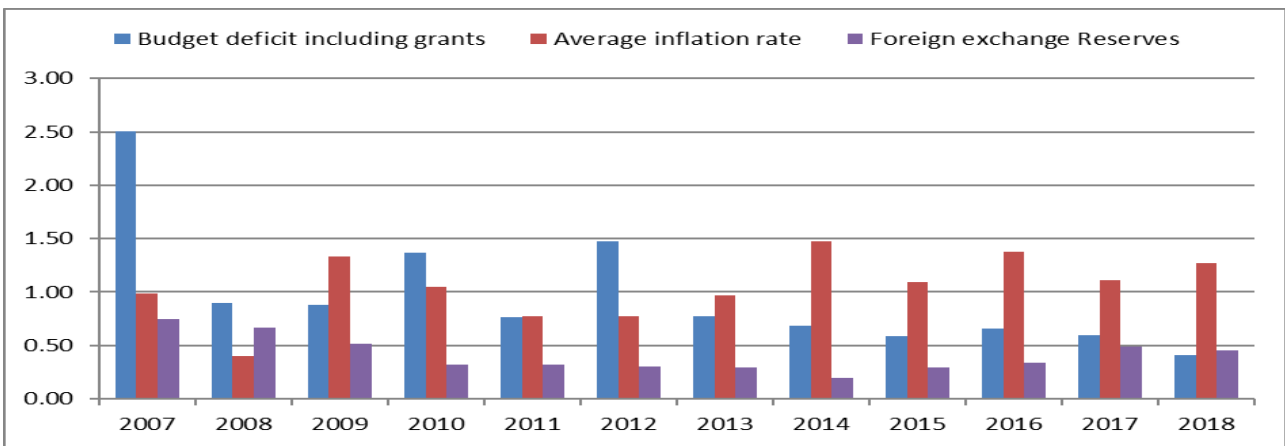

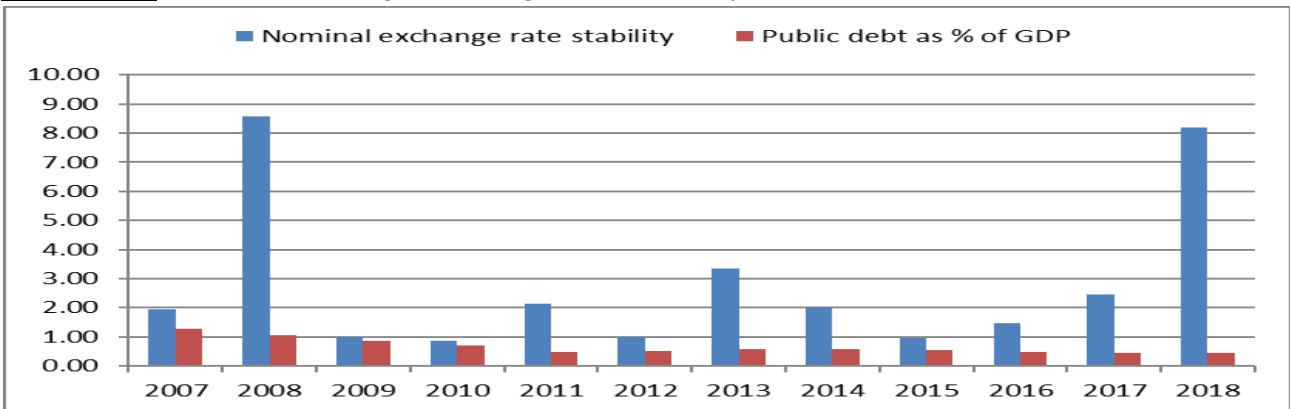**Figure 3.13:** Evolution of the sigma-convergence of secondary criteria

Figure 3.14: Evolution of the average budget deficit in relation to the target and the standard deviation