Inflation Deviations Assessments of OCA Properties in the WAMZ

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by

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Abstracts

This paper traced the historical developments of monetary intrgration of West African and discussed the OCA theory and properties. Similarities in inflation is one of the properties of an optimum currency area (OCA). Literatures on inflation (as a property of an OCA) have been able to spell out the implications of inflation rates similarities among members or would-be members of a monetary union. This paper therefore aimed principally at the examination of the homogeneity in the patterns of inflation across the West African Monetary Zone (WAMZ) consisiting of Guines and the Anglophone West African countries (comprising of The Gambia, Ghana, Liberia, Nigeria and Sierra Leone); as well as investigating the degree of inflation deviations from some benchmarks. Annual data of consumer price index and GDP deflator inflation for the WAMZ countries, the United States (US) and the EMU employed here spans between 1980 and 2015. Data analyses were performed in six stages to assess inflation convergence, majorly by checking the feasibility of exchange fixation in the monetary zone through the measure of absolute inflation rate differentials generated by the deviations of the WAMZ's individual member's inflation rate from: (i) the US and the Eurozone's inflation rates, (ii) the convergence criterion policy inflation target rate of 5%, and (iii) the WAMZ's average inflation over a convergence 12-year period. These were further to some necessary correlation studies. These properties of integration of inflation rate differentials are very revealing for inflation rate convergence among WAMZ member countries. From the evaluations, there were evidences to suggest that The Gambia is the most country feasible for the exchange rate integration and fixation with the euro and the US dollars while Nigeria, the lead economy yielded unfavourable results in the inflation evaluation. Empirical findings also suggested that shocks to inflationary trends in the WAMZ would have permanent and long lasting effects on inflation rates in the zone as inflation may not return to the trend path overtime. This denote that the cost implications of following disinflationary policies in WAMZ countries may be high while it is very likely to be difficult forecasting or predicting future inflation movements which are based on past inflationary behaviours.

1. Background

In 2000, the West African Monetary Zone, consisting of The Gambia, Ghana, Guinea, Liberia, Nigeria and Sierra Leone, was formally established. The expectation was the formation of WAMZ would propelled the institution of a monetary union which would be characterised by a common central bank and a single currency (the eco), meant to replace the existing national currencies of members. The desire to fasten the process of the monetary integration of the African sub-region was indicated by the 15-member countries of the ECOWAS in 2000. This crystallised into a 2-phase programme for the creation of a single currency for the region. The idea was that the WAMZ (of the Anglophone West African countries and Guinea) will merge will merge with the existing West African CFA zone franc shared by members of the West African Economic and Monetary Union (WAEMU) to form a formidable monetary union across the whole of West Africa in the future as part of the African Economic Community's six-stage process of achieving a monetary union and a single currency for Africa by 2028. The proposed monetary union failed to commence after some few attempts, the last of which was in 2015. The first phase of the plan was the launching of a single currency to be known as '*eco*' by members of the West African Monetary Zone (WAMZ) while the second phase was the merger of the WAMZ with the existing WAEMU to evolve a single currency for the whole of ECOWAS member states by January 2020.

There were four quantitative primary convergence criteria for countries within the WAMZ: (i) single digit inflation rate by 2000 and inflation rate of 5% by 2003; (ii) budget deficit (excluding grants) of not more than 5% of GDP by 2000 and 4% by 2002; (iii) central bank financing of budget deficit to be limited to 10% of previous year's tax revenue; and (iv) gross external reserves to cover at least three months of imports by the end of 2000 and six months by end-2003. Additional six secondary convergence criteria to be observed in support of the primary convergence criteria are: no accumulation of new domestic payment arrears and liquidation of all old arrears; tax revenue should not be less than 20% of the GDP; wage bill should not be less than 35% of tax revenue; domestically financed public investment should be at least 20% of tax revenue; the central parity of nominal exchange rate determined on 31 December, 2003 should be maintained with 15 per cent fluctuation band as defined by WAMZ Exchange Rate Mechanism (ERM-II); maintenance of positive real interest rates.

Table 1: WAMZ Members' Primary Convergence Criteria Attainments (2000-2014)

Budget Deficit/GDP (....should be ≤ 4%)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Gambia	3.6	9.8	9.1	5.2	9.9	8.4	2.7	1.1	4.2	8.6	2.7	4.2	4.6	8.8	9.1
Ghana	10.1	13.2	8.3	7.5	8.1	6.9	12.9	1.4	19.5	12.4	5.9	0.9	5.9	8.2	6.4
Guinea	5.2	3.4	6.2	8.8	5.9	1.6	2.0	0.9	1.7	7.5	14.3	2.9	3.7	3.1	3.9
Liberia	0.9	1.9	1.0	3.7	4.4	0.9	-3.0	3.4	2.0	2.0	-4.2	-0.6	-4.2	-1.0	-2.0
Nigeria	2.7	5.8	5.9	2.8	17.0	1.3	0.6	0.6	0.2	3.3	3.8	5.0	2.6	2.7	1.0
S/Leone	17.3	16.7	16.5	19.4	14.3	9.5	8.5	5.0	7.0	11.0	5.2	5.0	5.6	1.5	3.4

Inflation Rates (....should be ≤5% or 0.05)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Gambia	0.2	8.1	13.0	17.6	8.0	1.8	1.4	6.0	6.8	2.7	5.0	4.8	4.3	5.7	5.6
Ghana	40.5	21.3	15.2	23.6	11.8	13.9	10.9	12.8	18.1	16.0	14.7	8.7	9.2	11.6	15.5
Guinea	7.2	5.2	6.1	12.9	27.6	29.7	39.1	12.8	13.5	7.9	15.5	21.4	15.2	11.9	9.7
Liberia	3.2	19.4	11.1	5.0	16.1	7.0	8.9	11.7	9.4	7.8	7.3	8.5	7.7	7.6	9.9
Nigeria	14.5	16.4	12.1	23.8	10.0	11.6	8.5	6.6	15.1	12.0	12.4	10.8	12.2	8.5	8.0
S/Leone	-28.0	3.4	-1.3	11.3	14.4	13.1	7.3	13.8	12.3	12.0	17.1	16.0	12.9	10.4	7.1

Central Bank Financing (....should be ≤10% RF)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Gambia	0.0	80.7	22.0	63.1	0.0	0.0	0.0	0.0	35.9	13.7	14.9	12.6	0.4	na	41.0
Ghana	57.9	0.0	12.1	0.0	1.6	0.0	0.0	0.0	17.3	0.0	0.0	10.5	0.0	9.2	11.0
Guinea	24.0	-0.7	24.5	14.6	26.2	-8.8	54.0	0.0	5.8	38.7	91.0	0.0	0.0	0.0	0.0
Liberia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nigeria	0.0	29.3	0.0	19.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
S/Leone	0.0	8.9	0.0	26.4	0.0	0.0	13.3	0.8	0.3	18.6	37.6	1.1	0.0	0.0	7.6

Gross External Reserves (....should be ≥6 months)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Gambia	7.5	7.2	2.9	3.1	4.7	5.2	4.9	4.4	4.3	6.5	6.8	6.1	4.8	na	3.7
Ghana	0.8	1.2	2.3	4.1	3.7	4.0	3.7	3.9	2.2	4.4	3.7	3.15	0.03	3.5	4.2
Guinea	2.2	2.8	2.3	1.6	1.2	1.1	0.8	0.4	1.1	1.0	4.2	3.7	3.1	3.4	3.1
Liberia	3.6	2.6	0.0	-0.2	0.2	0.1	0.1	0.7	0.7	0.7	4.3	3.3	2.2	2.4	3.0
Nigeria	13.6	11.3	9.9	8.5	16.1	11.8	15.1	17.4	15.3	13.0	7.9	6.3	9.5	8.9	7.4
S/Leone	2.8	2.3	3.1	1.7	3.3	4.8	4.9	5.1	4.2	6.2	1.9	2.56	2.5	2.1	2.8

Source: West African Monetary Agency and Author's Calculations

A mid-term convergence assessment in 2002 revealed that despite some achievements by WAMZ member countries, these were not adequate enough support the take-off of the monetary union in January 2003. A major problem was the inadequate commitment of member countries of WAMZ to support their commitment expressed with actions. This consequently led to the extension of the WAMZ programme to 30 June, 2005 so that the common central bank and the common currency would take off on 1 July 2005. Another deadline of 31 December, 2009 was set so that the single currency and the common central bank would be effective from 1 January 2010. Due to same reasons this could not be met. The official reason for this action was stated as "the global economic and financial crisis which has put constraints on member state's ability to meet the convergence criteria individually and collectively". The last agreed take off date of 1 January 2015

actually became unrealistic thus bringing about heavy cloud over the take-off of the monetary union.[1] It is necessary to state that as at date, the WAMZ has no take-off date. Tables 1 above exhibits the year-by-year attainments of the primary convergence criteria by the six WAMZ countries over the thirteen-year convergence period spanning from 2000 to 2014. The summary of the three-year (2012-2014) averages of the achievements of these primary criteria are presented in the first segment of Table 2. Further in Tables 2, the country-by-country achievements of five secondary convergence criteria by the WAMZ countries over a 13-year period (2010-2013) are displayed. On comparative basis, Tables 3 below shows the rankings of the WAMZ countries regarding the meeting of the primary and secondary convergence criteria over the 3-year periods of assessments while the ranking of the 3-year averages over the period of 13 years are as displayed in Table 4. Nigeria and Guinea respectively achieved the number one spots in the achievements of the primary and secondary convergence criteria while Ghana and Sierra Leone took the last position in each category, respectively. In general, for both the primary and secondary convergence criteria over the 3-year period, Nigeria gets the number one ranking as Ghana and Sierra Leone share the position at the bottom of the table.

Table 2: 3-year Averages of Convergence Indicators Attainments by WAMZ Members

3-year Average of Primary Convergence Indicators (2012-2014)						
	Gambia	**Ghana**	**Guinea**	**Liberia**	**Nigeria**	**S/Leone**
Budget Deficit/GDP (≤4%)	5.7	6.8	3.5	-2.4	2.1	3.5
Inflation Rates (≤5%)	5.2	12.1	12.2	8.4	9.5	10.1
Central Bank Financing(≤10%)	20.7	6.7	0.0	0.0	0.0	2.5
Gross External Reserves (≥6 months)	4.2	2.6	3.2	2.5	8.6	2.4
3-year Average of Secondary Convergence Indicators (2010-2013)						
	Gambia	**Ghana**	**Guinea**	**Liberia**	**Nigeria**	**S/Leone**
Tax Revenue/GDP (≥20%)	13.6	16.9	17.1	24.2	12.8	9.8
Wage Bill/Tax Revenue (≤35%)	44.4	46.6	28.7	47.4	38.0	58.2
Public Investment/Tax Revenue (≥20%)	7.7	14.7	27.8	13.6	17.7	26.6
Real Interest Rates (> 0)	4.5	8.5	2.2	-6.8	-6.5	-7.7
Stability of Real Exchange Rate (± 5%)	-4.5	-10.2	-5.6	-4.7	-1.1	5.4

Source: West African Monetary Agency and Author's Calculations

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[1] From all indications, the WAMZ member countries found it difficult to meet the convergence criteria.

Table 3: Rankings of the Attainments of the Convergence Indicators by WAMZ Members

Rankings of the 3-year Average of <u>Primary</u> Convergence Indicators (2012-2014)						
	Gambia	**Ghana**	**Guinea**	**Liberia**	**Nigeria**	**S/Leone**
Budget Deficit/GDP	5	6	3	1	2	3
Inflation Rates	1	5	6	2	3	4
Central Bank Financing	6	5	1	1	1	4
Gross External Reserves	2	4	3	5	1	6
Member Country's Total	**14**	**20**	**13**	**9**	**7**	**17**
Overall Ranking	*4th*	*6th*	*3rd*	*2nd*	*1st*	*5th*
Rankings of the 3-year Average of <u>Secondary</u> Nominal Convergence Indicators (2011-2013)						
	Gambia	**Ghana**	**Guinea**	**Liberia**	**Nigeria**	**S/Leone**
Tax Revenue/ GDP	4	3	2	1	5	6
Wage Bill/Tax Revenue	3	4	1	5	2	6
Public Investment/Tax Revenue	6	4	1	5	3	2
Real Interest Rates	2	1	3	5	4	6
Stability of Real Exchange Rate	3	6	5	4	2	1
Member Country's Total	**18**	**18**	**12**	**20**	**16**	**21**
Overall Ranking	*3rd*	*3rd*	*1st*	*5th*	*2nd*	*6th*

Source: West African Monetary Agency and Author's Calculations

Table 4: Rankings of the 3-year Average of General (<u>Primary and Secondary</u>) Convergence Indicators (2010-2012)

	Gambia	**Ghana**	**Guinea**	**Liberia**	**Nigeria**	**S/Leone**
Budget Deficit/GDP	5	6	3	1	2	3
Inflation Rates	1	5	6	2	3	4
Central Bank Financing	6	5	1	1	1	4
Gross External Reserves	2	4	3	5	1	6
Tax Revenue/ GDP	4	3	2	1	5	6
Wage Bill/Tax Revenue	3	4	1	5	2	6
Public Investment/Tax Revenue	6	4	1	5	3	2
Real Interest Rates	2	1	3	5	4	6
Stability of Real Exchange Rate	3	6	5	4	2	1
Member Country's Total	**32**	**38**	**25**	**29**	**23**	**38**
Overall Ranking	*4th*	*5th*	*2nd*	*3rd*	*1st*	*5th*

Source: West African Monetary Agency and Author's Calculations

Within the convergence indictors' context, these ranking demonstrates the readiness of the six WAMZ countries for the currency union, from the most-ready (the top ranked) and the least-ready (the low-ranked).

The WAMZ's single currency failed to take-off and was postponed on three occasions in 2003, 2005 and 2009. In July 2014, due to lack of economic convergence among the WAMZ members, as well as apparent inadequate preparations, glaringly reflecting non-feasibility of the January 2015 take-off, the WAMZ gave up the introduction of the single currency as proposed and the Heads of States and Governments of the Economic Community of West African States (ECOWAS) changed focus and strategy by relinquishing the initial plan of the WAMZ-WAEMU merger and replacing this with rescheduling the creation of a single currency for the 15-member ECOWAS countries by January 2020.

In the bid to accelerate the pace for the introduction of the West African single currency, the Presidential Task Force set up by the Heads of States and Governments of ECOWAS considered three options (as displayed in Table 5 below) and eventually recommended that Option 2 (*The Gradual Option*) be adopted. The Gradual Option highlighted that the participation of countries in the single currency will be based on compliance with the primary convergence criteria before 2020.

Table 5: Options for Single Currency in ECOWAS

	Options	*Highlights*
Option 1	*Big Bang*	By 2020, all ECOWAS member countries will participate in the single currency; and countries that cannot meet the convergence criteria *ex-ante* will achieve these *ex-post*.
Option 2	*Gradualist*	Member countries of ECOWAS that are able to meet the primary convergence criteria before 2020 will participate in the single currency.
Option 3	*Critical Mass*	The launching of the single currency will take place in 2020 on the condition that the critical mass of countries representing at least 75% of the region's GDP

Source: ECOWAS Commission

The Task Force rejected Option 1 and Option 3 because of the apparent 'too high' levels of risks relating to macroeconomic instability if these two options are adopted. Given the present situations in the West Africa region, Table 6 below reflects four possible convergence situations that can result in 2020.

Table 6: Possible Convergence Situation in ECOWAS by 2020

Convergence Situation	Possible Qualifying Countries	Possible Outcomes
Situation 1	WAEMU countries	Current status-quo, leading to a fresh postponement of the ECOWAS single currency.
Situation 2	WAEMU countries + Nigeria + Ghana + few other WAMZ Countries	Launching of ECOWAS single currency.
Situation 3	WAEMU countries + WAMZ countries, but without Nigeria and Ghana.	Fresh postponement of the ECOWAS single currency because of the need to grant more time for the exclusion of the two economic heavy weights (Nigeria and Ghana).
Situation 4	WAEMU countries + WAMZ countries	Launching of the ECOWAS single currency.

Source: Bakoup and Ndoye (2016)

In order to meet the January 2020 deadline and the launching of the single currency as scheduled, those critical measures that were not well addressed in the past were highlighted for full implementation before 2017. These were: (a) preparing a strategy and procedures for the future single currency of the ECOWAS monetary integration; (b) drafting a treaty that will establish the monetary union between member countries of ECOWAS and for all members to ratify this treaty; (c) designing, adopting and ratifying the Article of Association of the future common central bank for ECOWAS. In May 2015, there was the rationalisation of the total number of convergence criteria from eleven to six, consisting of four primary criteria and two secondary criteria. These modifications also involved the reviews and changes in some benchmarks. The new primary criteria are: (i) ratio of budget deficit (commitment basis, including grants) to GDP of less than or equal to 3%[2]; (ii) average annual inflation rate of less than 10%[3]; (iii) central bank financing of budget deficit of less than or equal to 10% of the previous year's tax revenue; and (iv) gross external reserves - higher than or equal to 3 months of imports[4]. The new secondary criteria:[5] (a) stable nominal exchange rate of +/- 10%; and (b) ratio of total public debt to GDP of not more than 70%.

Similarities in inflation is one of the properties of an optimum currency area (OCA). Literatures on inflation (as a property of an OCA) have been able to spell out the

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[2] Previously, the maximum target for budget deficit/GDP ratio was 4% (excluding grants).
[3] This is against the former maximum of 5%.
[4] The previous cover was 6 months.
[5] Criteria removed in the rationalisation exercise were: positive real interest rate, real exchange rate stability, non-accumulation of domestic and external arrears, tax revenue/GDP, wage bill/tax revenue and public investments/tax revenue.

implications of inflation rates similarities among members or would- be members of a monetary union. It is against this background that this paper, examined the homogeneity in the patterns of inflation and the degree of inflation deviations from benchmarks set for the assessment. These evaluate the feasibility of monetary integration of the WAMZ.

2. Optimum Currency Area (OCA) Properties and Theoretical Underpinnings

There are so many definition of an optimum currency area given in literature. One can describe an optimum currency area as a domain within which exchange rates are fixed and monetary policy best maintain full employment, balanced international payments and a stable internal average price. It is an area that for optimal balance adjustments and effectiveness of domestic macroeconomic policy, has fixed exchange rates within the area but maintain flexible exchange rates with trading partners. It is a geographical region in which economic efficiencies are shared and huge economic benefits are created by a single currency; a region in which the benefits of forming a monetary union outweigh the cost. It is also a geographical and economic domain that operates one currency and one monetary policy operates and have a general means of payments either a single currency or several currencies whose exchange value are immutably pegged to one another with unlimited convertibility for both current and capital market transactions, but whose exchange rate fluctuate in unison against the rest of the world.

The history of the theory of optimum currency area (OCA) dates back to early 1960s when the criteria that should gauge the optimality of a region to have a single currency, thus forming a common currency area (OCA) was first formulated by Robert Mundell in 1961 and further developed significantly by Ronald McKinnon in 1963 and Peter Kenen in 1969. According to Krahi (2010), these three men contributed the main pieces for an academic debate where common notion has not been found yet, thus making the theory of optimal currency area an unfinished puzzle. In spite of the fact Robert Mundell is known as the father of the theory of optimum currency area, having formulated and named the theory, he was not the first to delve on the issue within the idea of the theory.

The development of the optimum currency area concept came in the context of the discussions of the relative advantages of the fixed exchange rate regime over the flexible exchange rate regime. During the early part of the Bretton Wood System, economists from many angles had various discussions which centre on the result and effect of the

fixed exchange regime; and some of their conclusion influenced the theory of optimum currency area (OCA). According to Mongelli (2005: 608), the OCA theory was developed when the Bretton Wood System of fixed exchange was still in operation. What Mundell tried to do was to determine if it would be optimal for currency of countries to float freely (Mundell, 1961). The predominant focus of Mundell is on areas with a single currency in which the control of money supply would be in the hands of one central bank.

In agreement with Cesarano (2006), discussions on the OCA theory and field associated with it can be categorised into two namely: the Friedman's View on one hand and the positions of Mundell, Mckinnon and Kenen on the other hand. Though, regarded as two groups of opinions, Kawai (1987) however sees Friedman to have opted for flexible exchange rate while Dellas and Tavlas (2009) see Friedman as having a critical view on policies that brings stabilization at the domestic level in accordance with the traditions of Keynesian economists. In the 1950s, it was generally assumed that Friedman called for flexible exchange rate regime. Boyer (2009) however regarded Friedman as the man who laid foundation for the subsequent theory of optimum currency area.

There are two major phases of contributions to the theory of optimum currency area: Pioneering Phase (first wave) and Cost-benefit Phase (second wave). In the Pioneering Phase Robert Mundell (1961), Ronald McKinnon (1963) and Peter Kenen (1969) are the important authors regarded as the traditional contributors of the OCA theory. Notable authors and contributors in the Cost-benefit Phase (second wave) are Corden (1972), Ishiyama (1975), Tower and Willet (1976) and Mundell (1973). Three major properties of the OCA theory are:

Property 1 - Labour Mobility and Wage Flexibility: These are contributions by Robert Mundell (1961) Robert Mundell is the initial contributor to the theory of optimum currency area in 1961 when he identified factor mobility as the strategic attribute of an optimum currency area.

Property 2 - Size and Openness of the Economy: These are the contributions made by Ronald McKinnon (1963): Ronald McKinnon is a second major contributor to the theory of optimum currency area as he emphasises on the size and the degree of openness of an economy as a factor that is crucial in a currency area that is optimal.[6]

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[6]This is the second major OCA criterion added by McKinnon The first criterion by Robert Mundell in 1961 is mobility of labour and flexibility of wages saying that if labour can easily move from a country that is negatively affected, to a

Property 3 - _Diversification of Production_: These are contributions by Peter Kenen (1969). In 1969, Peter Kenen introduced 'Product Diversification' as a more relevant criterion of an optimum currency area. Kenen (1969) says that with "diversity in a nation's product mix, the number of single product regions contained in a single country may be more relevant than labour mobility".

Right from the early 1960s when the theory of optimum currency area came to limelight, several authors, through their various seminal contributions have been able to come up with various properties of an optimum currency area. Most of these properties, which many regarded as prerequisites, features attributes or criteria of an optimum currency area are summarised in the Box 1 below:

Box 1: Properties/Criteria of an Optimum Currency Area and Implications	
Properties/Criteria	Implications
Flexibility of Nominal Wages and Price _(Friedman, 1963)_	Flexibility of wages and prices within/between members of a common currency area will make asymmetric shocks to be overcome easily because the movement adjusting for the shocks will not be linked with inflation in one country and/or sustained unemployment in another and thus bringing in higher degree of stability in the common currency area
Mobility of Factors of Production - Including labour _(Mundell, 1961)_	There will be reduction in the need to alter real factor prices and nominal exchange rate between member countries when responding to disturbances, if factors of production are mobile within the common currency area, even if factor costs are rigid. It will be more difficult to maintain a fixed exchange rate regime when the capital mobility is higher. Simply put, adjustments to asymmetric shock are facilitated and the pressures for adjustments in exchange rates are reduced when the degree of labour mobility is high.
Degree Openness of the Economy _(McKinnon, 1963)_	The higher the degree of economic openness of a member country of a common currency area, the more the likelihood of the transmission of the changes in international prices of tradables to domestic prices. If the higher share of domestic outputs of a country are generated from trades within the common currency area, such country will benefit from membership of the currency union.
Size of the Economy _(McKinnon, 1963)_	Large economies have the tendencies to be attracted by the flexible exchange rate regime implying that medium or small-sized countries find fixed exchange rate regime (as desired by monetary union) attractive.
Diversification of Production, Exports and Consumption _(Kenen, 1969)_	The higher the diversification of production and consumption by member countries of a currency union, the more likely the reduction in costs due from discarding nominal exchange rate changes between these countries, thus finding a common currency as valuable. The impact of shocks that are specific to a particular sector of the economy would be diluted by high level of diversification in production and consumption. Consequently, diversification shields economy against series of disturbances and causes reduction in the needs for changes in terms of trade through nominal exchange rate.
Similarities in Inflation or Differences in Inflation _(Fleming, 1971)_	It is more difficult to maintain a fixed exchange rate regime in situations of inflation rate differentials between member countries of a common currency area. External imbalances can crop up due to continuous differences in inflation rates of nations within the common currency area. Terms of trade will remain fairly stable when Inflation rates between countries are similar over time and at the same time low.

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country that is positively affected, any asymmetric shock between these countries would be outweighed while any central bank policy would be made redundant.

Fiscal Integration (*Kenen, 1969, De Bandt & Mongelli, 2000*)	When countries share supranational fiscal transfer system in redistributing funds to those member countries that are affected by adverse asymmetric shocks, such countries would also have smooth adjustments to such negative shocks and would require reduced adjustments in nominal exchange rate. This fiscal integration requires the needs to share the risks involved and necessitates a high level of political integration. Asymmetric shocks are counteracted through fiscal transfers – (When there are shocks, affecting particular member countries within a common currency area in different ways, fiscal transfers from prosperous member countries to non-prosperous member countries would counteract the effects of the shocks). High degree of policy integration leads to low inflation.
Political Integration (*Mintz 1970; Harberler, 1970; and Cohen, 1993*)	Several authors see economic integration to be so far in front of political integration. The political determination of countries to integrate is a significant condition for sharing a common currency. Cooperation on common economic matters, adherence to joint commitments, and more international linkage will all be strengthened and enhanced by political will of member nations within the common currency area. In transforming a group of nations to a successful common currency area, it essential that there is similarity of attitudes to politics and policies among member countries of the common currency area.
Financial Market Integration (*Ingram, 1962*)	The higher the level of financial integration, the greater the extent of the need to establish an optimum currency area across geographical blocs. The need for exchange rate adjustments can be reduced by financial market integration. Through capital market inflows, temporary adverse disturbances can be cushioned. With financial market integration, there will be reduction in the need to change inter-regional or intra currency area terms of trade through fluctuations in exchange rate. For the sustainability of a successful common currency area, tight financial market integration is essential.
Similarities of Shocks and Similarities in Policy Responses to the Shocks (*Bayoumi & Eichengreen, 1997; Masson &Taylor, 1993; Demertizis, Hughes &Rummel, 2000; Alesina, Barro & Tenreyro, 2002.*	If member countries of an optimum currency area record similarities in demand and supply shocks and the speed of at which their respective economy adjust as well as the speed of policy responses, there will be loss of monetary policy autonomy and fall in the cost of loss of direct control over the nominal exchange rate. Member countries of an optimum currency area showing large co-movements of output and prices would incur the lowest cost of dumping monetary independence vis-a-vis other member countries. This implying that the higher the similarities in shocks between members of a common currency area, the lower the costs of losing independence monetary policy.
Similarities in Monetary Policy Transmission (*Angeloni, Kashyap, Mojon and Terlizzese, 2001*)	Similarities in monetary transmission mechanism among member countries of an optimum currency area speak volume about the similarities in financial structures of these countries.
External Nominal Shocks	Fixed exchange rate regime will not be attractive to a potential member of an optimum currency area, if such country faces external nominal shocks. A flexible exchange rate system would be more appropriate.
Monetary Shocks	Fixed exchange rate regime will be more attractive to a potential member of an optimum currency area, if such country faces monetary shocks. A flexible exchange rate system would not be attractive.
Real Shocks	Fixed exchange rate regime will not be attractive to a potential member of an optimum currency area if such country faces real shocks. A flexible exchange rate system would be more appropriate.
Business Cycle Synchronisation	Flexible exchange rate regime will not be appropriate if the group of countries forming an optimum currency area has synchronised business cycle.
Central Bank's Credibility	If the central banks of the prospective member of a common currency area lack the credibility to moderate inflation, fixed exchange rate regime would be more advantageous, rather than flexible exchange rate.
Monetary Policy Effectiveness	For a prospective member of a common currency area, the cost of monetary independence is low (and not a high cost) such country's monetary policy is ineffective.

Sources: Author's compilations

Within the literature, there are many criteria for deciding how suitable countries are for an optimum currency area. However, the general agreement among the proponents[7] of 'optimum currency area' is that in such region, labour is very mobile while economies are faced with same forms of economic shocks. The assertion of the OCA literature is that if two or more countries are to share the same currency without experiencing negative effects, it is necessary and sufficient to meet the OCA criteria. This is a position grounded with the assumption that nominal exchange rates are very effective; otherwise countries should not abandon their currencies since it would be meaningless to do so. As a major macroeconomic stabiliser, exchange rate affects relative prices of all goods, terms of trade and wages. Therefore, it is necessary for countries coming together to form a monetary union to have some conditions in place so that the functioning of nominal exchange rates to be less fascination or attractive as an adjustment tool.

Similarities in inflation is one of the properties of an optimum currency area (OCA). Literatures on inflation (as a property of an OCA) have been able to spell out the implications of inflation rates similarities among members or would- be members of a monetary union. Fleming (1971) stressed that if a common currency area has differences in the trends of inflation rates among its member countries, there would be more difficulties in maintaining the fixed exchange rate regime as required of a monetary union due to the underlying general price level persistence behaviour and variability factor. Apart from this, the heterogeneous inflation patterns in a monetary union can propel external imbalances and at the same time, lead to unstable terms of trade. However, if terms of trade in member countries are stable, the need for various individual exchange rate in the currency union would be down played. Further emphasis of inflation convergence was made by Mundell (2000) who asserted the importance of inflation rate similarities for a currency union in fixing exchange rate easily

Dissimilarities in inflation rate connote strong signals of differences in economic structures and in the conducts of individual country's economy and if these inflation dissimilarities becomes wider and persistence, this has an implication of 'one size does not fit all'. Additional point in favour of the essence of inflation rates similarities for a currency union is the presumable low cost of being a member of the union because fiscal and monetary stance similarities are the root causes of inflation similarities. Divergences

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[7] Mundell (1961), McKinnon (1963), Kenen (1969), Gosh and Wolf (1994), Frankel and Rose (1998) and Alesina, Barro and Tenreyro (2002)

in the inflation rates will make currency union members to face 'real interest rate differentials'. The high inflation member countries with sound economic growth may take advantage of the implied 'low interest rate' which further stimulates those economies concerned, but to the disadvantage of the low inflation-low growth member countries.

Members of the WAMZ that decided to participate in the monetary zone will eventually abandon their national currencies; lose the control of their respective national monetary policies and fix their nominal exchange rates in relation to each other. From that date, the WAMZ member countries will neither be able to change short term interest rates nor change exchange rates (price of their currencies). They will no more be able to determine the quantity of money within their respective economies.

As alternative to exchange rate, for countries in this category, only factor mobility (capital mobility and labour mobility) and wage flexibility will remain the main adjustment mechanisms.

The loss of the ability of a member of a monetary union (like WAMZ countries) to operate national monetary and exchange rate policies independently in the presence of asymmetric shocks will be a cost of monetary union to these countries. However, the West African Monetary Zone will be an optimum currency area if the benefits that the six member countries will receive for joining the monetary union will outstrip or outweigh the costs of being in the union. The key concern for the proposed monetary cooperation within the WAMZ is the uniformity in inflation and output growth dynamics and the responses of these macroeconomic indicators to shocks and whether this will affect member countries in the same manner. Therefore if a WAMZ member country has large asymmetric (country-specific) shock and there is no appropriate adjustment mechanism, such country should not join the common currency area; and if this apply to a group of countries planning to go onto monetary union, it is not advisable for such group of countries to create a common currency union. This is because of the cost of maintaining a fixed exchange rate which would outweigh the benefits of such fixed exchange regime.

3. Review of Literature Empirical Studies Literature on OCA Perspectives of WAMZ Monetary Integration

From the perspectives of the properties of OCA, a few number of empirical studies have evaluated the feasibility of the monetary integration of the WAMZ as well as the viability of the membership of the proposed monetary union for prospective member countries.

Findings and results of some of these empirical researches are discussed in this section. An evaluation of the economic rationale for monetary union in Sub-Saharan Africa was performed by Benassy-Quere and Coupet (2003) through the use of cluster analyses of a sample of 17 countries by adapting variables emanating from the OCA theory (and the fear-of-floating literature) to conclude that the creation of the WAMZ around Nigeria is not supported by data. The result however, supported the inclusion of The Gambia, Ghana and Sierra Leone in an extended WAEMU arrangement or creation of a separate monetary union with the 'core' of the WAEMU and The Gambia. Further to this study by Benassy-Quere and Coupet (2003), Bankage (2008) used the methodology initiated by Bayoumi and Eichengreen (1997) to compute OCA indices for 21 African countries. This study got a high predicted volatility for Nigeria in relation to other ECOWAS countries, leading to the suggestion that the inclusion of Nigeria in the WAMZ (and in the extended WAEMU) is not suitable according to the OCA theory. Cham (2011) assessed the feasibility of the WAMZ as a monetary zone using the combination of both macroeconomic convergence and the OCA properties (openness, shock synchronisation and labour mobility) to gather evidence towards concluding that the degree of labour mobility is low, shocks were not synchronised and the degree of openness of members (apart from The Gambia and Nigeria) were below average. Omotor and Niringiye (2011) used simple bivariate of vector autoregressive model to assess WAMZ's feasibility as an OCA from the perspective of economic shocks and got results suggesting that the WAMZ is feasible to form an OCA. Coleman (2011) investigated business cycle synchronisation in five member countries of the WAMZ (The Gambia, Ghana, Guinea, Nigeria and Sierra Leone) applying Pearson correlation of trend and cyclical component of GDP to investigate co-movements at high frequencies between computed Z-scores for pairings of the five candidate countries. The results indicated lack of a consistent pattern of synchronised growth cycles which raised concerns over economic sustainability of the WAMZ. With the application of cointegration and fractional cointegration methods, inflation dynamics and common tendencies of real GDP of the WAMZ countries were investigated by Alagidede et al. (2012) to gather evidence of substantial heterogeneities in these respects, across the WAMZ. Raji (2012) applied dynamic GMM and cross country correlation to assessed the real exchange rate misalignments and economic performance of the WAMZ to determine the implications of these for economic unionisation of the WAMZ to conclude that the WAMZ experiences asymmetrical correlations between real exchange rate

misalignments and economic performances. The cross-country correlation test however revealed moderate degree of symmetrical relationship using some macroeconomic variables such as real exchange rate, misaligned real exchange rate, openness, inflation and output. Costs and benefits of a common currency in the WAMZ were estimated by Okafor (2013) by means of behavioural models to capture costs elements (asymmetric shocks, loss of monetary autonomy, fiscal distortion) and benefits (trade creation, financial integration effects and policy coordination gain) to yield evidences towards suggesting that potential benefits of common currency in the WAMZ will likely be lower than marginal costs due to loss of monetary policy sovereignty which could be monumental in spite of extended trade creation benefits. In a correlation investigation of structural shocks across the WAMZ, Harvey and Cushing (2015) concluded that the WAMZ countries responded asymmetrically to common supply, demand and monetary shocks and so, will respond differently to a common monetary policy. Assessments of the extent of convergence and business cycle synchronisation of business cycles within the WAMZ was performed by Alagidede and Tweneboah (2015) in the analyses of growth rate convergence. The results gathered suggested dissimilarities in business cycles within the WAMZ. Analyses of trade within the WAMZ and WAMZ's trade with other countries with West Africa, Europe and Asia were made by Mensah (2016) who found strong evidence against trade symmetry in the WAMZ as well as some evidences of marginal convergence in inflation, real GDP growth and monetary policy rate, with reasons to infer that partial convergence in the WAMZ as well as significantly low trade within the WAMZ and the WAMZ countries with outside world.

From monetary and macroeconomic stability perspectives, Balogun (2007) came up with a conjecture testing the ineffectiveness of the influence of independent monetary and exchange rate policies on domestic activities (particularly, output and inflation) in the WAMZ and the counter-productivity of these indicators. Findings from this study suggested that domestic monetary policy (captured by money supply and credits to government) hurt real domestic output, thus causing growth stagnation; and that further output expansion could not adequately dampen the fuelling effects of past inflation just as exchange rate devaluation had no effect on growth in the short run, but manifested in domestic inflation in the WAMZ. Balogun (2007) thus got evidence to draw conclusion that under an appropriate monetary union arrangement, the WAMZ countries (as a condition) would be better-off by surrendering their independence over monetary policy

instruments to the proposed regional body, just as adverse effects of interest rate on output was established contrary to theoretical proposition of inverse relationship. Coulibaly and Gnimassous (2013) also concurred with some previous literature on the exclusion of Nigeria from the proposed WAMZ or ECOWAS monetary integration in the assessment of the optimality of monetary union for the West African bloc, employing a 'new estimation methodology catch-up' co-movement between exchange rate misalignment as well as cluster analysis.

Further evaluation of the WAMZ by Balogun (2009) examined the determinants of inflation differentials in a panel study of the WAMZ vis-à-vis the set macroeconomic convergence benchmark since 2000 when the plan to form the currency union commenced. In this study, empirical models based on the theoretical foundations of the New Keynesian underpinnings were estimated leading to the evidence (gathered from a stylised 5-country inflation rate differential model of the WAMZ) that the desired price stabilisation target could not be attained because the unweighted average regional inflation rates varied widely among the WAMZ countries and were often above the single digit target; and that the major monetary policy instruments determinants of inflationary divergence are in the pursuance of distortions in interest rates, exchange rates overvaluation and expansionary monetary policies. These led to the conclusion that the WAMZ countries have a very slim chance of attaining price convergence in the foreseeable future; and that these countries would be better-off conditionally on surrendering their inferior price stabilisation approach to a supranational monetary authority that would have the ability to enforce strict compliance with regional monetary and inflation targets. The fiscal-monetary policy interaction analysis of Debrun et al (2005) gathered evident to prove that the monetary union proposed for the non-WAEMU bloc (principally, the WAMZ) is not feasible for member countries. Asongu (2013) applied granger causality analysis to examine the 'embryonic African monetary zones' at large, in a "short-run Schumpeterian trip". The specific analysis of the WAMZ produced evidence to suggest that the WAMZ is not feasible as a monetary zone because of the 'non-traditional strand of monetary policy regimes for which appropriate policy instruments cannot be used in the short-run to offset adverse output disturbances. In further evaluation, Asongu (2014) employed GMM in a real, monetary and fiscal policy convergence analysis of the proposed African monetary unions as OCAs. The conclusion that the WAMZ was not feasible as a monetary zone was drawn due to the lack of real,

monetary and fiscal policy convergence, implying a substantial absence in the much desired 'catch-up' for policy harmonisation.

In spite the reviewed body of literature on the OCA perspective of monetary integration of the WAMZ in this section, this paper enhanced the value of the compendium of empirical research works on the feasibility test through added knowledge in area of inflation deviation evaluation of monetary integration of the West African sub-region.

4. Data and Methods:

Annual data of consumer price index and GDP deflator inflation for the WAMZ countries, the United States (US) and the EMU employed here spans between 1980 and 2015. Data analyses were performed into six-fold. At first and second stages, analyses of the descriptive statistics and inflation correlation among the WAMZ countries were made. At the third stage of analyses, inflation convergence was investigated towards checking the feasibility of exchange fixation in the monetary zone through the measure of absolute inflation rate differentials generated by the deviations of the US and the Eurozone's inflation rates from the WAMZ's individual member's inflation rate.[8] The differential inflation rates for each country were averaged over the periods covered. Low average inflation deviations translate into high level of inflation convergence. A WAMZ country exhibiting high differential inflation in these assessments are not feasible for exchange rate fixation with the US *dollars* or the *euro* (as appropriate).

The absolute inflation rate differential measure of inflation convergence were generated for each WAMZ country as:

$$INFD = \pi_t - \pi_{US_t/EMU_t} \hspace{4cm} 1$$

where $INFD$ is inflation differential, π_t is the inflation rate for the assessed WAMZ country and π_{US_t/EMU_t} is the inflation rates for the US or EMU (as appropriate). Due to data constraints, these analyses were split into two sub periods: (i) the 12-year pre-convergence period (1989-2000) and (ii) the 12-year period convergence period (2001-2012). In the fourth aspect of analyses, differentials between WAMZ's member countries inflation rates and the reference value of 5% inflation rate (expressed as the convergence

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[8] Absolute values of these deviations are taken in order to avoid the opposite sign value cancellations.

criterion) were estimated and evaluated. This assessed the degree of divergence from the inflation target of the future common central bank for the zone. These were estimated as:

$$INFD = \pi_t - \pi^*$$
<div align="right">2</div>

where π^* is the convergence criterion policy inflation target rate of 5%. Inflation rate differential analyses under this approach cover the 12-year convergence period (2001-2012). The fifth approach was to check inflation rates misalignments by calculating the annual inflation rate differentials as deviations from the WAMZ's average inflation over the convergence 12-year period of 2001 to 2012. These were generated as:

$$INFDF = \pi_t - \pi_{WAMZ}^{AV}$$
<div align="right">3</div>

where: π_{WAMZ}^{AV} is the average inflation rate for the WAMZ over the convergence period (2001-2012). Effort were made to analyse the correlation of the inflation differentials under the three approaches so as to establish similarities (or otherwise) inflation trends and patterns in the WAMZ countries. The sixth and final approach was to appraise the time series properties of the inflation rate deviations under the three approaches emphasising the deviations from the convergence benchmark of 5% inflation rate as this establishes if there are evidence of consistent/persistent impacts of idiosyncratic shocks that affects inflation rates in the WAMZ countries. Here, unit root tests were carried out to determine the order of integration of the inflation deviation and to reveal if they are stationary or not.

5. Results and Findings:

The pattern of the coefficients of variation of 4-periodic inflation are displayed in Figure 1 below. Over the pre-convergence periods (1981-1990 and 1991-2000) and the convergence periods (2001-2010 and 2011-2015), it is interesting to note that the degree of dispersion subsided during the second phase of the convergence period despite higher degrees of dispersion in the previous three periods. Ghana recorded the lowest dispersion in this latter period. What happened during the last phase is a reflection of improvements in the convergence of inflation variations with the WAMZ.

Figure 1: Inflation Periodic Coefficients of Variation for the WAMZ Countries
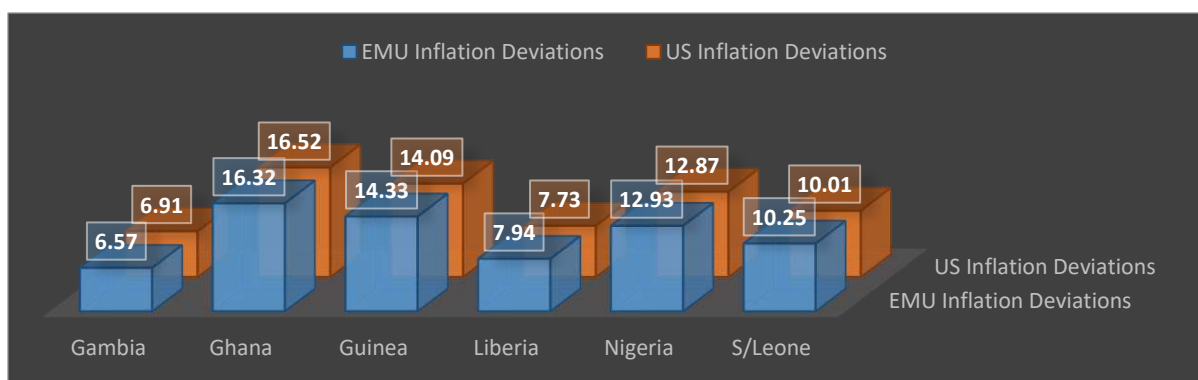

WAMZ Countries' Inflation Periodic Coefficients of Variation
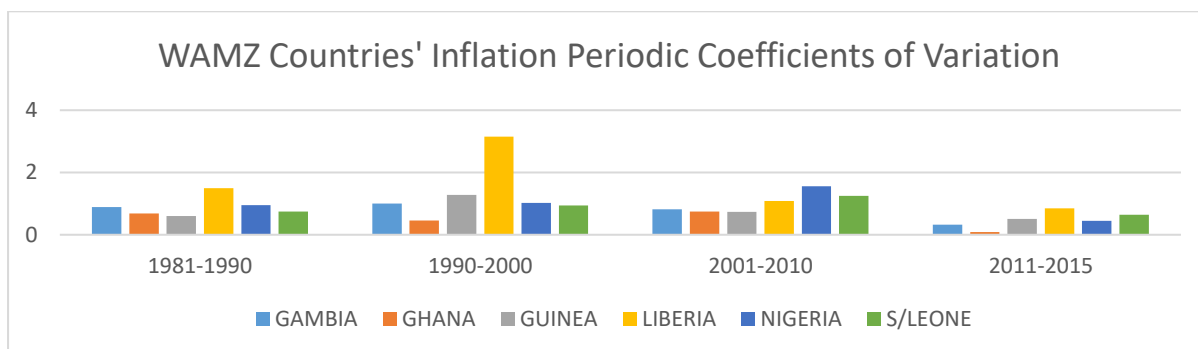
Sources: Author's Estimation and EIU Database

Figure 2: WAMZ Countries' Inflation Deviations from EMU and US Inflation Rates (Pre-convergence Period)
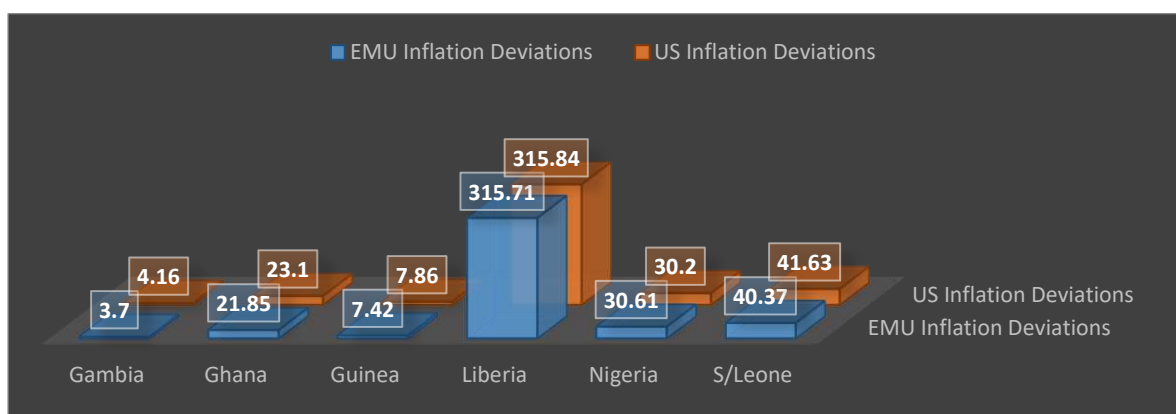
Sources: Author's Estimation and EIU Database

Figure 3: WAMZ Countries' Inflation Deviations from EMU and US Inflation Rates (Convergence Criteria Period)

Sources: Author's Estimation and EIU Database

The results of inflation convergence investigated by the means of measuring absolute inflation rate differentials generated through deviations of the US and the Eurozone's inflation rates from the WAMZ's individual member's inflation rate are shown in Figures 2 and 3 above.

It is necessary to state that high variation in Liberia during the 1991-2000 period was due to the 1998 huge war-time inflation of 3,737.22%. If this outlier is expunged from the country's inflation estimation, the country's position would have been much more different.

Table 7: Correlation Matrix of WAMZ Countries' Inflation Deviations from Eurozone Inflation Rates

Pre-convergence Criteria (PC)Period						
	The Gambia	*Ghana*	*Guinea*	*Liberia*	*Nigeria*	*Sierra Leone*
The Gambia	1					
Ghana	0.12	1				
Guinea	0.65	-0.32	1			
Liberia	-0.11	-0.42	-0.25	1		
Nigeria	-0.14	0.40	0.07	-0.23	1	
Sierra Leone	0.74	-0.25	0.90	-0.15	0.004	1

Convergence Criteria (CC)Period						
	The Gambia	*Ghana*	*Guinea*	*Liberia*	*Nigeria*	*Sierra Leone*
The Gambia	1					
Ghana	0.71	1				
Guinea	-0.39	-0.65	1			
Liberia	-0.13	0.01	-0.34	1		
Nigeria	-0.23	-0.28	0.08	-0.18	1	
Sierra Leone	-0.40	-0.63	0.33	-0.22	0.07	1

Sources: Author's Estimation, EIU Database and EViews 7 Output

These exhibit the pattern and extent of inflation deviation of the WAMZ countries in terms of feasibility in exchange rate fixation with the euro and the US dollars. Simple interpretation of these results is that the lower the differential, the higher the inflation convergence with the respective currency (the euro/US dollar) and the stronger the argument in favour of exchange rate fixation with the respective currency. A country displaying high inflation deviation from these currencies is not feasible as a part of the monetary union, for exchange rate fixation with the single currency.

An important feature of the results is the similarities in the Eurozone/US deviation results for the WAMZ countries displayed in Tables 7 and 8. In the pre-convergence period, The Gambia was the most feasible member of the proposed single currency for the euro and US dollar exchange rate fixation just as Liberia was the least feasible. In the convergence era, The Gambia was consistence with her number one ranking and Liberia moved up to the second position while Ghana is the least candidate for exchange rate fixation with the *euro*/US *dollar*.

Table 8: Correlation Matrix of WAMZ Countries' Inflation Deviations from US Inflation Rates

Pre-convergence Criteria (PC)Period						
	The Gambia	*Ghana*	*Guinea*	*Liberia*	*Nigeria*	*Sierra Leone*
The Gambia	1					
Ghana	0.10	1				
Guinea	0.71	-0.36	1			
Liberia	-0.28	-0.41	-0.20	1		
Nigeria	0.08	0.48	0.17	-0.37	1	
Sierra Leone	0.76	-0.27	0.90	-0.14	0.04	1

Convergence Criteria (CC)Period						
	The Gambia	*Ghana*	*Guinea*	*Liberia*	*Nigeria*	*Sierra Leone*
The Gambia	1					
Ghana	0.75	1				
Guinea	-0.39	-0.66	1			
Liberia	-0.11	0.02	-0.36	1		
Nigeria	-0.17	-0.23	-0.01	-0.25	1	
Sierra Leone	-0.40	-0.62	0.34	-0.19	-0.02	1

Sources: Author's Estimation, EIU Database and EViews 7 Output

Table 9: Correlation Matrix of WAMZ Countries' Inflation Deviations from Convergence Criterion Inflation (5%) Rate (Convergence Criteria Period)

	The Gambia	*Ghana*	*Guinea*	*Liberia*	*Nigeria*	*Sierra Leone*
The Gambia	1					
Ghana	0.77	1				
Guinea	-0.49	-0.61	1			
Liberia	-0.25	-0.45	0.03	1		
Nigeria	-0.24	-0.35	0.04	-0.07	1	
Sierra Leone	-0.42	-0.63	0.52	0.19	-0.23	1

Sources: Author's Estimation and EIU Database and Eviews 7 Output

Table 9 above gives the correlation matrix of the deviation of the WAMZ countries' inflation rates from the target rate during the convergence period. The results revealed negative correlation among the WAMZ countries while those positive correlation were very weak. The correlation matrix of the target rate differentials in Table 10 below reflects many negative correlation coefficients indicating huge dissimilarities among the WAMZ countries in this regard.

Table 10: Correlation Matrix of WAMZ Countries' Inflation Deviations from WAMZ's Average Inflation (Convergence Criteria Period)

	The Gambia	Ghana	Guinea	Liberia	Nigeria	Sierra Leone
The Gambia	1					
Ghana	0.66	1				
Guinea	-0.42	-0.64	1			
Liberia	-0.13	-0.54	0.15	1		
Nigeria	-0.29	-0.13	-0.09	-0.28	1	
Sierra Leone	-0.38	-0.65	0.54	0.24	-0.28	1

Sources: Author's Estimation and EIU Database

Table 11: Ng-Perron Unit Root Tests on Deviations of WAMZ Inflation from Inflation in Eurozone and US.

Pre-convergence Period (WAMZ/Eurozone)					
Country	MZa	MZt	MSB	MPT	Decision
Gambia	-2.433	-1.012	0.416	9.487	Non-stationary
Ghana	-18.332	-3.026	0.165	1.340	Stationary
Guinea	-2.277	-1.026	0.450	10.432	Non-stationary
Liberia	-5.419	-1.642	0.303	4.531	Non-stationary
Nigeria	-5.453	-1.651	0.303	4.493	Non-stationary
Sierra Leone	-6.414	-1.708	0.266	4.054	Non-stationary
Pre-convergence Period (WAMZ/US)					
Country	MZa	MZt	MSB	MPT	Decision
Gambia	-2.321	-1.016	0.438	10.098	Not stationary
Ghana	-16.730	-2.891	0.173	1.468	Stationary
Guinea	-2.880	-1.175	0.407	8.403	Not stationary
Liberia	-5.419	-1.641	0.303	4.532	Not stationary
Nigeria	-5.420	-1.646	0.304	4.520	Not stationary
Sierra Leone	-6.519	-1.722	0.264	3.998	Not stationary
Convergence Period (WAMZ/Eurozone)					
Country	MZa	MZt	MSB	MPT	Decision
Gambia	-3.391	-1.264	0.373	7.177	Not stationary
Ghana	-84.453	-6.482	0.077	0.320	Stationary
Guinea	-4.055	-1.416	0.349	6.045	Not stationary
Liberia	-5.122	-1.589	0.310	4.805	Not stationary
Nigeria	-4.912	-1.550	0.315	50.19	Not stationary
Sierra Leone	-2.360	-0.610	0.258	7.667	Not stationary
Convergence Period (WAMZ/US)					
Country	MZa	MZt	MSB	MPT	Decision
Gambia	-3.321	-1.246	0.375	7.315	Not stationary
Ghana	-141.086	-8.387	0.059	0.191	Stationary
Guinea	-4.017	-1.409	0.351	6.102	Not stationary
Liberia	-5.189	-1.601	0.308	4.742	Not stationary
Nigeria	-3.811	-1.362	0.357	6.428	Not stationary
Sierra Leone	-1.652	-0.444	0.268	8.426	Not stationary

Source: Author's Computation, Eviews Output and EIU Database

As the future common central bank for the WAMZ requires information on time series properties on inflation when giving future inflation targets and designing monetary policy, evidence of the unit root behaviour of the properties of inflation differentials under the three approaches in this study are exhibited in Tables 11 above and 12 and 13

below as derived from the Ng-Perron unit root tests with constant and trend at 5% significance level.

Table 12: Results of Ng-Perron Unit Root Tests on Deviations of WAMZ Inflation from Convergence Criterion (5%) Inflation Rate

Convergence Period Only					
Country	*MZa*	*MZt*	*MSB*	*MPT*	*Decision*
Gambia	-3.041	-1.198	0.394	7.965	*Not stationary*
Ghana	-37.342	-4.294	0.115	0.728	*Not Stationary*
Guinea	-3.925	-1.394	0.355	6.243	*Not stationary*
Liberia	-4.379	-1.480	0.338	5.595	*Not stationary*
Nigeria	-3.577	-1.323	0.370	6.840	*Not stationary*
Sierra Leone	-2.474	-0.746	0.301	7.984	*Not stationary*

Source: Author's Computation, Eviews Output and EIU Database

Apart from Ghana under the deviation from *euro*/US *dollar*, these properties produce evidences that the null hypothesis of unit root could not be rejected under the four scenarios for all the WAMZ countries, implying non-stationary deviations suggesting that shocks to inflationary trends in the WAMZ would have permanent and long lasting effects on inflation rates in the zone as inflation may not return to the trend path overtime.

Table 13: Ng-Perron Unit Root Tests on Deviations of WAMZ Inflation from WAMZ's Average

Convergence Period Only					
Country	*MZa*	*MZt*	*MSB*	*MPT*	*Decision*
Gambia	-4.024	-1.403	0.348	6.096	*Not stationary*
Ghana	-6.615	-1.757	0.265	3.885	*Not Stationary*
Guinea	-4.477	-1.487	0.332	5.484	*Not stationary*
Liberia	-4.657	-1.524	0.327	5.263	*Not stationary*
Nigeria	-2.913	-1.150	0.395	8.232	*Not stationary*
Sierra Leone	-3.026	-0.864	0.285	7.268	*Not stationary*
Ng-Perron 5% Critical Values					
	MZa	*MZt*	*MSB*	*MPT*	
	-8.100	-1.980	0.233	3.170	

Source: Author's Computation, Eviews Output and EIU Database

What these suggest is that the cost implications of following disinflationary policies in WAMZ countries may be high while it is very likely to be difficult forecasting or predicting future inflation movements which are based on past inflationary behaviours. These properties of integration of inflation rate differential are very revealing for inflation rate convergence among WAMZ member countries.

6. Conclusions

From the background of OCA theory and inflation similarities property of the OCA theory, this research study investigated patterns of inflation deviations across the WAMZ. The Inflation differential analyses reveal the order at which WAMZ members are strong in the proposed common currency, exchange rate fixation with the US dollars or the euro, given low inflation differentials generated. The Gambia is at the top in both pre-convergence and post convergence periods. Liberia and Ghana are the bases in these two period respectively. Thus, The Gambia is the most country feasible for the exchange rate integration and fixation with the euro and the US dollars while Nigeria, the lead economy yielded unfavourable results in the inflation evaluation. The investigation of inflation deviation from convergence target of 5% results in non-stationarity of the deviations, suggesting that shocks to inflationary trends in the WAMZ would have permanent and long lasting effects on inflation rates in the zone as inflation may not return to the trend path overtime. This denote that the cost implications of following disinflationary policies in WAMZ countries may be high while it is very likely to be difficult forecasting or predicting future inflation movements which are based on past inflationary behaviours.

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