

Can WAMZ Area Inflation Converge without Ex-Ante Monetary Policy Coordination?

by

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Abstract

This paper examines the inflation differential in the WAMZ area and argues that the union may not be feasible with insistence on inflation convergence to preset benchmark given monetary policy asymmetry. Using a 5-country panel data of WAMZ area, which span the period of 1986-2011, the study estimates with econometrics method, the determinants of inflation differential from the set benchmark in the light of country specific monetary policy shocks. The main results show that most of the participating countries did not attain the desired inflation convergence target. Over the sample period, the un-weighted average regional inflation rates were most often above a single digit target and vary widely among the countries. The major country specific monetary policy instruments determinants of inflationary divergence are the pursuit of distorted interest rates, exchange rates overvaluation and expansionary monetary policies, propelled by government credit which tended to crowd out private sector. A simulation of future out turns suggest that ex ante policy coordination at the regional level holds the key to ex post inflation convergence in WAMZ area.

Keywords: Inflation differentials, price convergence, exchange rate, WAMZ members, panel data

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1. Introduction

One of the preconditions for the commencement and introduction of the common currency (to be known as the Eco) by West African Monetary Zone (WAMZ[‡]) countries is the need to sustain low inflation nationally. It is the general expectation that these countries routing for a common currency, must pursue *ex ante* independent monetary policies not only capable of narrowing the inflation differentials, but also foster convergence around a single digit.

The observation, since the commencement of WAMZ in 2000 is that this primary convergence criteria has been the most difficult to fulfill. Several studies {Ojo (2005) , Nnanna (2007) , Adamgbe and Agu (2012)} show that there is poor prospect for inflation convergence given monetary policy asymmetry. If progress is to be made towards convergence, there is therefore the need to understand what generates the inflation differentials among these countries. In particular, there is the need to ascertain the role of monetary policy pursuits especially interest rates, exchange rates, and credit policy stance in generating inflationary spiral in these countries. A two-fold objective of this paper therefore is: firstly to establish the extent of divergence in independent monetary policy conditions and secondly to ascertain the prospect for inflation convergence without ex-ante monetary policy coordination to preset benchmark given its extent of asymmetry among WAMZ member countries.

The rest of the paper presents a brief review of related literature in part 2. Part 3 reviews the theoretical and analytical models. Part 4 presents the results while Part 5 the concluding remarks and policy implications.

2. Related Literatures

Various models have been used to analyze the inflation differentials especially in the euro area {Hofmann and Remsperger (2005); Angeloni and Ehrmann (2007);

[‡] WAMZ countries included in this study are: Gambia, Ghana, Guinea, Nigeria and Sierra Leone

Honohan and Lane (2003), Horvath and Koprnicka (2008); Mara and André (2011)}. These were studies designed to validate *ex post* the doctrine of the “law of one price” which suggest that with common currency and monetary policy pursuits, that Euro zone inflation ought to converge with no significant differential. The empirical approach of these studies was econometric differing only in terms of model specification, scope and span of data. While Hofmann and Remsperger (2005) analyzes inflation differentials by panel generalized method of moments over the period 1999Q1-2004Q2, Angeloni and Ehrmann (2007) analyzes both output and inflation differentials observed across the euro area over the period 1998Q1-2003Q2 from aggregate demand and supply equations. The findings of these authors suggest that the observed inflation differentials are mainly influenced by differences in cyclical positions and fluctuations of the effective exchange rate combined with a rather high level of inflation persistence, while the proxies of price level convergence does not come out significantly.

A similar study by Honohan and Lane (2003) estimate the panel data model to assess the driving factors of inflation differentials in the euro area over the period 1999-2001. Their findings show that a member country’s external exposure, the cyclical position, the fiscal policy, and the price level convergence are vital determinants of inflation differentials in the euro area. Also in a more recent study, Horvath and Koprnicka (2008) examine the determinants of inflation differentials in a panel of the new European Union member states vis-à-vis the euro area in 1997-2007. Their main results are that exchange rate appreciation and higher price level in the new EU members is associated with narrower inflation differential vis-à-vis the euro area, while fiscal deficit and positive output gap seem to contribute to higher

inflation differential with the conclusion that real convergence factors rather than cyclical variation are more important for inflation developments in the new EU members, as compared to the euro area.

A more recent study by Mara and André (2011), present new evidence on inflation differentials in the Euro Area based on data that span 1999-2010, including the era of recent global financial crisis. Adopting both descriptive and econometrics methods, the authors analyze the evolution of inflation dispersion and differentials since the start of EMU. Their findings confirm the existence of inflation differentials for the entire sample period which was not the case prior to the crisis period. A gravity model estimation results confirms that price level equalization, productivity differentials, differences in cyclical positions, labor and product market rigidities are important determinants of inflation differential. They conclude that inflation differentials are not the result of equilibrating, transitory forces, but rather of persistent structural and country-specific factors which calls for structural reforms in labor and product markets, and countercyclical fiscal policy measures at the individual country level.

However, more related to the focus of this paper are a number of literatures {Popkova, Egbe, Akopov and Popovsky (2011); Ary Tanimoune, Combes and Tapsoba (2007); Adamgbe and Agu (2012); Taylor (2013)} which discuss inflation as part of the macroeconomic convergence criteria in WAEMU, the proposed WAMZ and ECOWAS monetary union. Popkova, et al (2011) notes the lack of consensus in the literatures about the relative effectiveness of monetary policy integration in fostering macroeconomic convergence. They argue that aside from the relative ineffectiveness of independent monetary and exchange rate policies to influence domestic economic activities, the associated cost of country specific shocks are much higher than those implied by monetary union. They conclude that ex *ante* adoption of a common monetary and exchange

rate policies via regional economic integration may have positive implications not only for macroeconomic convergence but also for accelerating the pace towards the emergence of a regional currency.

Ary Tanimoune, Combes and Tapsoba (2007) analyze a panel dataset which span from 1990 to 2006 to evaluate the implication of country specific inconsistency/conflict between fiscal and monetary policies for the emergence of a common currency in ECOWAS. The authors categorized the monetary and fiscal policy stance (measured by primary structural fiscal balance and monetary condition index respectively) into 4 possible regimes of policy mix, mostly in the WAEMU subsample, where integration is deeper than in the non-WAEMU countries. Their findings confirm the existence of policy mix incoherence and heterogeneity in the economic structure. They conclude that fostering more policy mix coherence through ex ante regional policy coordination seems a necessary precondition to macroeconomic convergence.

In a paper by Taylor (2013), the preparedness of WAMZ countries for the formation of the proposed common currency, the Eco was evaluated based on the guidelines of the Optimum Currency Area framework, with specific focus on macroeconomic shocks, the level of product/export base diversification and the extent of trade amongst member countries. The empirical methods adopted by the author include the construction of correlation matrices for inflation and percentage GDP growth, a gini of similarity across sectors (namely agriculture, manufacturing and services) and a gravity equation which includes variables to study the added effect of membership in ECOWAS, WAMZ and the CFA currency Zone. Contrary to the original hypothesis, that these countries are not sufficiently prepared, the mixed results indicate that over time the WAMZ countries may successfully be able to form a

common currency with ex ante policy integration, starting with countries that are the most similar.

Adamgbe and Agu (2012) evaluate through dynamic general equilibrium models estimated by Bayesian estimation techniques, the monetary policy preferences in the WAMZ which shows that in spite of regional efforts towards achieving convergence, the single digit inflation objective has not been realized. Their analysis shows preferences for output stabilization instead of inflation, an indication of a passive use of monetary policy as a demand management tool.

In summary, the literatures reviewed so far range from some that evaluate the extent to which adoption of common monetary policies fosters price convergence in the Euro zone{Hofmann and Remsperger (2005); Angeloni and Ehrmann (2007); Honohan and Lane (2003), Horvath and Koprnicka (2008); Mara and André (2011)} to those which discuss inflation as part of the macroeconomic convergence criteria in WAEMU, the proposed WAMZ and ECOWAS monetary union{Popkova, Egbe, Akopov and Popovsky (2011); Ary Tanimoune, Combes and Tapsoba (2007); Adamgbe and Agu (2012); Taylor (2013)}. However, none of these studies focused specifically on evaluating the prospect of inflation convergence in the WAMZ area in the absence of ex-ante monetary policy coordination – a key criteria that must be attained by majority of the participating countries before the commencement of monetary union.

This study therefore is expected to differ from Taylor (2013) on three grounds: the scope, objective and method of analysis. In particular whereas Taylor's study span the period 1990-2008 and analyzed using a gravity model (for trade data), a correlation matrix (for GDP and inflation data) and a Gini of similarity (for diversification data), this study analyses data which span 1986 to 2012 using a pooled regression method to establish the aggregate effect of independent monetary policies on inflation convergence

potential. The motivation for this approach is the desire to show that there is limited likelihood that the monetary policy conditions of participating countries in the WAMZ can converge in the absence of monetary policy coordination. This tends to challenge the traditional optimum currency area (OCA) arguments that *ex ante* pursuit of macroeconomic policy convergence that leads to similarity of shocks and minimizes the costs of unionization (Mundell 1961, Kenen 1969) is a necessary precondition for the optimal operations of the OCA *ex post*. Instead it sets the agenda for the alternative approach adopted by the West African Economic and Monetary Union (WAEMU) rooted in the endogeneity theory (Rose, 2000) that an imposition of a monetary union could in itself acts as veritable instrument of macroeconomic convergence and trade creation without insistence on *ex ante* compliance to policy convergence criteria.

3. The Theoretical and Analytical Framework

The model adopted for this study draws from various New Keynesian models that have been used to analyze the inflation differentials in the euro area (i.e. the degree of non-convergence of prices) {Hofmann and Remsperger (2005), Angeloni and Ehrmann (2007), Altissimo *et al.* (2005), and Honohan and Lane (2003)}. In particular the empirical methodology specified for this study draws from Honohan and Lane (2003) and Horvath and Koprnicka (2008) who focus their attention to finding the relationship between inflation differentials and the role of exchange rate channel, output gap, fiscal policy, and the countries' relative price level in a panel of euro area countries using annual data over 1999-2001. Honohan and Lane (2003) postulated a fairly general specification for inflation differentials as:

$$\pi_{it} - \pi_t^E = \beta(z_{it} - z_t^E) + \delta([P_{it-1} - P_{it-1}^*] - [P_{t-1}^E - P_{t-1}^{E*}]) + \varepsilon_{it} \quad \dots \quad (Eq.1)$$

Where π_{it} and π_t^E are the annual national and euro zone inflation rates, respectively; z_{it} and z_t^E denote national and euro area variables that exercise short-term influence on the

inflation rate; P_{it} and P_t^E denote the national and euro area price levels, P_{it}^* and P_t^{E*} represent the national and euro zone long-run equilibrium price levels. In order to account for long run convergence, in the face of tight trade and institutional linkages, Honohan and Lane (2003) assume a common long-run national and euro area price level, simplifying Eq. 1 as:

$$\pi_{it} - \pi_t^E = \beta(z_{it} - z_t^E) + \delta(P_{it-1} - P_{t-1}^E) + \varepsilon_{it} \dots \dots \dots \dots \quad (Eq.2)$$

Horvath and Koprnicka (2008) noted that it is easy to realize that a combination of euro area variables results in a time dummy, and as such re-wrote Eq. 2 as:

$$\pi_{it} = \phi_t + \beta z_{it} + \delta P_{it-1} + \varepsilon_{it} \dots \dots \dots \dots \quad (Eq.3)$$

Where they define the z in line with Honohan and Lane (2003) as:

$$z = [\Delta NEER_{it-1}, GAP_{it}, FISC_{it}] \dots \dots \dots \dots \dots \quad (Eq.4)$$

Where $\Delta NEER_{it-1}$ is the lagged change of nominal effective exchange rate; GAP_{it} denotes the output gap, $FISC_{it}$ represent the fiscal deficit and P_{it} is the lagged price level. Horvath and Koprnicka (2008) estimated the following empirical specification:

$$\pi_{it} = \phi_t + \beta_1 \Delta NEER_{it-1} + \beta_2 GAP_{it} + \beta_3 FISC_{it} + \delta P_{it-1} + \varepsilon_{it} \dots \quad (Eq.5)$$

They noted that the time dummies (ϕ_t) in Eq. 5 capture the common movements in inflation, so that the regression explains the inflation differentials in terms of idiosyncratic national movements. Horvath and Koprnicka (2008) expectations of the coefficient on effective exchange rate β_1 is negative, as exchange rate appreciation is expected to decrease inflation rate. On the other hand, β_2 is expected to be positive, as higher output gap results in more inflationary environment. β_3 is likely to be negative, as fiscal surplus reduces aggregate demand and therefore contributes to lower inflation. The sign of δ is expected to be negative as lower price level is likely to be associated with higher inflation rate. They further posit that for obvious reasons, output gap and

fiscal balance can be endogenous to inflation and therefore estimated Eq. 5 by the generalized method of moments (GMM), where endogenous variables were instrumented by lagged values.

Empirical Models

The empirical models to be estimated rely very strongly on the theoretical foundations of these New Keynesian models. With regard to aggregate price stabilization around a preset target or benchmark, I adopt Horvath and Koprnicka (2008), i.e. Eq. 3, but with significant modifications. Whereas they define the vector z of Eq. 3 as: $z = [\Delta NEER_{it-1}, GAP_{it}, FISC_{it}]$ where $\Delta NEER_{it-1}$ is the lagged change of nominal effective exchange rate; GAP_{it} denotes the output gap, $FISC_{it}$ represent the fiscal deficit and P_{it} is the lagged price level, I redefine the vector z as: $z = [\Delta NER_{it-1}, y_{it}, M_2, CP_{it}, CG_{it}, i_{it}]$ where ΔNER_{it-1} is the lagged change in nominal exchange rate of the national currencies to the US \$, their dominant reserve currency; y_{it} denotes the real output while M_2 is money supply, which is an important component of independent monetary policy targets of WAMZ countries, in the light of pursuits of multiple objectives of macroeconomic stabilization policy; CP_{it} and CG_{it} represents banking sector credit to private and government sectors respectively, to capture the loose stand of monetary policy with regard to government borrowing and the extent of bias it implies for private sector credit; and finally, i_{it} denotes the overall interest rate policy stance of the monetary authorities, represented in this model by the monetary policy rate or minimum rediscount rates. This gives us the following empirical specification:

$$\pi_{it} = \phi + \beta_1 \Delta NER_{it-1} + \beta_2 y_{it} + \beta_3 CP_{it} + \beta_4 CG_{it} + \beta_5 M_2 + \beta_6 i_{it} + \delta P_{it-1} + \varepsilon_{it} \quad \dots \quad (Eq.6)$$

Whereby π_{it} is the net inflation differential of each participating country from optimal targets; ϕ_t represents cross-sectional fixed effects constants of independent movements in inflation differentials within the panel; β_s are regression coefficients of the included explanatory variables, δ the regression coefficient of past trends in aggregate price level.

The expectation of the coefficient of nominal exchange rate β_1 is negative, as exchange rate appreciation is expected to decrease inflation rate. On the other hand, β_2 is expected to be positive, as higher output gap results in more inflationary environment. β_3 is likely to be negative, as expansion in credit to the private sector is expected to lead to output expansion (a positive shock) and therefore contributes to lower inflation. β_4 is likely to be positive, as expansion in credit to government is expected to lead to expansion in aggregate demand and therefore contributes to higher inflation. β_5 is likely to be positive, as expansion in aggregate money supply is expected to lead to expansion in aggregate demand and therefore contributes to higher inflation. β_6 is likely to be negative, as lower interest rates is expected to lead to output expansion (a positive shock) and therefore contributes to lower inflation. The sign of δ is expected to be negative as lower price level is likely to be associated with higher inflation rate.

Given that WAMZ is made up of an initial 5 countries viz.: Gambia, Ghana, Guinea, Nigeria and Sierra Leone, the method adopted for estimation of Eq. 6 is panel data regressions. This equation is estimated using pooled equation generalized least square with cross-sectional seemingly unrelated regression procedures. The data series for this study span the period 1986 to 2011. The major source of data for this analysis is IMF International Financial Statistics (2012), Economic Community of West African States (ECOWAS) websites and the National Bureau of Statistics of the participating countries in the WAMZ.

4. Empirical Results

This section presents the results of the descriptive statistics and econometrics analysis of the WAMZ area and country specific monetary conditions and inflation under uncoordinated independent monetary policy pursuits.

4.1 WAMZ Area and Country Specific Inflation and Monetary Conditions

Table 1 shows that over the time period, the average regional inflation rates were

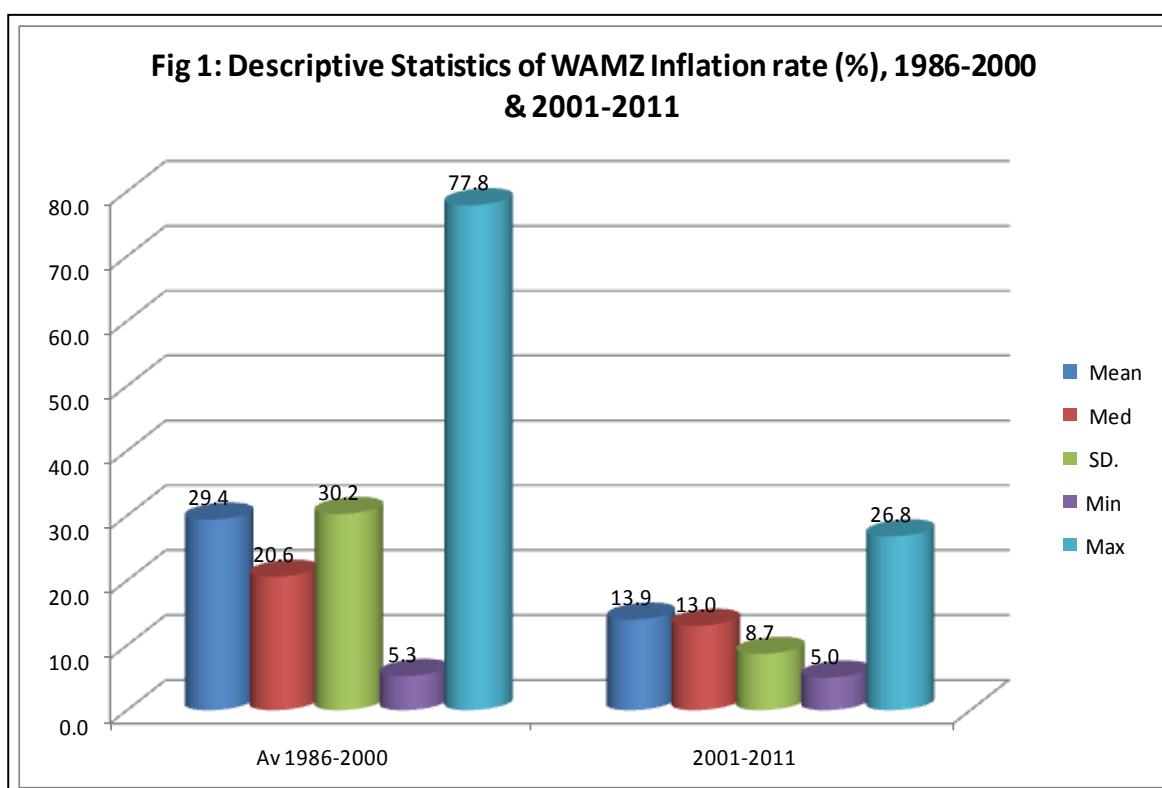
most often above a single digit target and vary widely among the countries (See Table 1). The mean and the median average inflation rates stood at 22.8 and 14.1 per

	WAMZ	GMB	GHA	GIN	NGA	SLE
Mean	22.8	8.9	23.1	14.2	22.1	46.0
Median	14.1	5.2	22.0	15.7	13.0	20.5
Maximum	267.1	56.6	59.5	34.7	72.8	267.1
Minimum	-3.9	0.8	8.7	0.4	5.4	-3.9
Std. Dev.	32.0	11.1	12.5	10.9	20.0	60.5
Skewness	4.6	3.3	1.1	0.2	1.3	2.3
Kurtosis	30.8	14.4	4.0	1.7	3.1	8.3
Jarque-Bera	4623.7	188.1	6.7	2.0	6.9	53.5
Probability	0.0	0.0	0.0	0.4	0.0	0.0
Sum	2970.2	230.7	601.4	368.0	575.2	1194.9
Sum Sq. Dev.	132474.1	3078.0	3923.2	2979.8	10043.6	91505.2
Observations	130	26	26	26	26	26

Source: Estimated by Eviews from Regression data base 1986-20

cent respectively surpassing the less than 10 per cent convergence criteria rate. Indeed, Table 1 shows that except for Gambia, all the WAMZ countries have had astonishing records of double digit inflation. The country that recorded the minimum inflation rate during the study period is Gambia at an average of 5.6 per cent while Sierra Leone recorded the maximum average inflation rate of 29.3 per cent. The table also shows that for more than half the period under review, both Gambia and Guinea recorded single digit inflation with the median statistics estimated at 3.3 and 7.0 per cent, respectively. These two countries can be described as the low inflation group among WAMZ while Nigeria and Ghana are the highly inflation group, with Sierra Leone joining the club of hyperinflation after a protracted period of political crisis and instability.

Figure 1 presents inter temporal comparison of regional inflation outcomes prior to and with commencement of WAMZ. This showed that although WAMZ wide mean inflation rate declined from 29.4 per cent in 1986-2000 to 13.9 per cent in 2001-2011, it is however still above the desired price convergence level of 10 per cent. It could be inferred that perhaps, acceding to pursue independent monetary policies that could foster compliance with macroeconomic convergence criteria would explain the decline. However, given the divergence in the use of fiscal and monetary policies by the



participating countries in WAMZ, attaining price convergence may remain elusive. This is borne out by the wide dispersion around the mean which ranged from a minimum of 5.0 per cent to a maximum of 26.5 per cent in 2001 to 2011.

The regional average monetary expansion rate is estimated at 41.3 per cent and it is driven mainly by huge expansion in government borrowing which grew by 200.6 percent and that to the private sector estimated at 77.9 per cent. Coincidentally, the zone-wide average rate of currency devaluation converged significantly with the

Table 2a: Descriptive Statistics of WAMZ Area member country Inflation and Monetary Policy Trends for The Gambia, Ghana and Guinea, 1986-2011																		
Country	Gambia						Ghana						Guinea					
Descr Stat	INF	ΔNCP	ΔNCG	NER	MRR	ΔM2	INF	ΔNCP	ΔNCG	NER	MRR	ΔM2	INF	ΔNCP	ΔNCG	NER	MRR	ΔM2
Mean	7.05	13.0	45.1	6.5	14.9	17.8	23.7	36.7	29.6	24.8	25.7	37.6	13.5	268.7	29.7	13.6	13.6	86.7
Median	5.20	14.0	17.7	4.1	14.0	14.7	22.1	26.7	21.5	15.0	25.3	39.2	14.1	12.9	26.7	11.6	14.0	18.2
Maximum	23.50	59.7	921.6	37.2	29.0	51.8	59.5	183.0	102.5	100.0	45.0	56.5	34.7	6274.0	99.5	62.4	22.3	1326.0
Minimum	0.80	-29.3	-476.5	-11.4	9.0	-3.8	10.1	-2.1	-8.0	0.0	12.5	13.3	0.4	-101.6	-19.5	-18.5	6.0	-77.5
Std. Dev.	5.53	21.3	230.0	11.2	5.3	12.2	12.7	36.3	28.9	29.2	10.0	12.6	11.1	1251.8	31.1	15.7	4.4	278.8
Skewness	1.29	-0.1	1.9	0.9	1.3	1.0	1.1	2.7	0.8	1.4	0.6	-0.2	0.3	4.7	0.6	1.2	0.0	3.9
Kurtosis	4.49	2.9	10.4	3.8	4.2	4.2	3.9	11.6	3.0	4.2	2.4	2.1	1.7	23.0	3.1	5.6	1.9	17.2
Jarque-Bera	8.92	0.1	71.8	3.9	8.6	6.0	5.8	107.4	2.8	9.9	1.7	1.1	2.0	507.8	1.4	12.1	1.2	271.9
Probability	0.01	1.0	0.0	0.1	0.0	0.1	0.1	0.0	0.2	0.0	0.4	0.6	0.4	0.0	0.5	0.0	0.5	0.0
Sum	169.30	326.1	1126.7	163.1	387.0	444.1	568.1	917.6	738.8	618.9	667.0	940.4	323.6	6718.2	743.5	325.3	352.3	2166.5
Sum Sq. Dev.	704.16	10891.9	1270131.0	3013.4	689.2	3563.1	3705.8	31711.5	20094.5	20478.0	2482.4	3787.8	2838.3	37606682.0	23188.3	5693.8	478.9	1865913.0
Observations	24	25	25	25	26	25	24	25	25	25	26	25	24	25	25	24	26	25

average zonal inflation rate, but the real interest rate was negative. The divergent

Table 2b: Descriptive Statistics of WAMZ Area member country Inflation and Monetary Policy Trends for Nigeria and Sierra Leone, 1986-2011												
Country	Nigeria						Sierra Leone					
Descr Stat	INF	ΔNCP	ΔNCG	NER	MRR	ΔM2	INF	ΔNCP	ΔNCG	NER	MRR	ΔM2
Mean	23.3	31.3	725.3	28.4	14.0	29.5	38.0	40.2	165.3	30.0	9.5	34.1
Median	13.4	23.3	13.6	7.1	13.5	22.6	20.5	30.5	6.7	13.6	4.5	29.6
Maximum	72.8	115.3	17647.6	321.5	26.0	64.2	165.7	150.3	2408.4	153.3	55.0	76.2
Minimum	5.4	-14.5	-170.1	-5.7	6.0	9.3	-3.9	-11.3	-166.3	-5.1	0.5	8.8
Std. Dev.	20.4	30.2	3526.8	67.8	4.3	16.1	41.8	36.5	581.0	41.2	14.4	20.0
Skewness	1.2	1.5	4.7	3.5	0.5	0.8	1.7	1.6	3.2	1.6	2.5	1.0
Kurtosis	2.8	5.1	23.0	15.3	3.9	2.6	5.2	5.2	11.7	4.7	8.3	2.9
Jarque-Bera	5.4	13.9	508.6	209.4	1.9	3.0	15.9	15.4	121.3	13.9	56.6	4.2
Probability	0.1	0.0	0.0	0.0	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.1
Sum	558.7	781.7	18131.3	709.8	364.7	737.4	911.6	1006.2	4133.5	750.8	246.1	851.8
Sum Sq. Dev.	9613.6	21880.1	299000000.0	110445.3	467.8	6210.8	40189.6	31986.8	8102195.0	40797.3	5218.5	9597.2
Observations	24	25	25	25	26	25	24	25	25	25	26	25

growth path of prices and key monetary policy stance indicators in these countries is as

shown in Table 2a and 2b.

4.2 Effect of ex ante uncoordinated Monetary Conditions on WAMZ area Inflation Differential

Table 3 presents the Equation 6 regression results of the regional determinants of inflation differential of WAMZ countries from the less than 10 per cent target set for

Table 3: Regression Results of Monetary Policy Stance Determinants of Inflation Differential among WAMZ Countries					
Dependent Variable: Inflation Differential ($\pi-10\%$)					
Method: Pooled EGLS (Cross-section SUR)					
Sample (adjusted): 1988 2010					
Included observations: 23 after adjustments					
Cross-sections included: 5					
Total pool (balanced) observations: 115					
Linear estimation after one-step weighting matrix					
Independent Variable	Symbol	Coefficient	Std. Error	t-Statistic	Prob.
Constant	ϕ	7.821179	4.317456	1.81	0.07
Credit to privat sector	CPt-1	9.37E-05	2.49E-05	3.77	0.00
Credit to privat sector	CPt-2	-0.00014	2.93E-05	-4.67	0.00
Credit to government.	CGt-2	1.29E-05	4.99E-06	2.58	0.01
Monetary policy rate	it	0.81665	0.087573	9.33	0.00
Nominal Exchange Rate	Δ NER	-3.06707	1.069205	-2.87	0.01
Fixed Effects (Cross)					
GMB--Constant	ϕ{-GMB}	-15.2			
GHA--Constant	ϕ{-GHA}	-21.3			
GIN--Constant	ϕ{-GIN}	5.9			
NGA--Constant	ϕ{-NGA}	5.9			
SLE--Constant	ϕ{-SLE}	24.8			
Weighted Statistics					
R-squared	0.71	Mean dependent var		0.77	
Adjusted R-squared	0.69	S.D. dependent var		1.73	
S.E. of regression	1.01	Sum squared resid		106.29	
F-statistic	29.25	Durbin-Watson stat		1.39	
Prob(F-statistic)	0				

the commencement of WAMZ. The adjusted R^2 estimated at 69 percent confirms that the model is of good fit and that the included explanatory variables sufficiently explains the existence of significant relationship between the area wide inflation differential and uncoordinated independent monetary policy stance of member countries during the

period under review. It can be inferred that efforts at macroeconomic (price) stabilization around a desired target was not attained.

The overall estimate of the fixed effects constant, ϕ_i , show significant variation in its value across the participating countries in WAMZ. Whereas, it exhibited a negative spread from the regional average in the case of the Gambia and Ghana, the countries with low records of inflation, it is positive for Guinea, Nigeria, and Sierra Leone that have poor records of inflation control (see Table 2a & 2b).

The regression result presented in Table 3 also show that at the zone-wide level, the major determinants of inflation differential are credit to the private (CP_{t-1} and CP_{t-2}), credit to government sector (CG_{t-2}), interest rate stance (i_t) and trends in nominal exchange rates (ΔNER). The trends in monetary expansion rate (M_2), real GDP and past values of aggregate price level were not significant determinants of inflation differential at the zonal level. However, past values of consumer prices are important determinants of inflation differential for Nigeria and Sierra Leone. This confirms the rational expectation theory that past high level of consumer prices drives future inflation.

Country specific monetary condition and the implications for Inflation Differential

Table 4 presents the results of the effect of country specific monetary conditions on inflation differential from preset WAMZ area convergence criteria in the light of didactic policy pursuits by participating countries. The Gambia that exhibited low levels of inflation, maintained a restrained monetary policy, which limited government borrowing and kept exchange rate stable, with reasonable commitment to lending to private sector. The parameter estimates confirm a positive and significant relationship between private sector lending and inflation in the Gambia. This finding is consistent with supply side policy theory that increased borrowing by private sector leads to higher

Table 4 : Regression results of Country specific determinants of inflation differential from Regional preset Target with uncoordinated monetary policies															
Dependent Variable: National Inflation Differential from regional preset target of 10%															
Country	Gambia			Ghana			Guinea			Nigera			Sierra Leone		
Ind. Variable	Coef.	t-St.	Prob.	Coef.	t-St.	Prob.	Coef.	t-St.	Prob.	Coef.	t-St.	Prob.	Coef.	t-St.	Prob.
CP _t										0.01	4.70	0.00	0.000111	6.09	0.00
CP _{t-1}	0.0045	4.02	0.00												
CP _{t-2}				-0.0188	-2.95	0.00	-0.0001	-10.49	0.00						
CG _t	-0.0018	-2.22	0.03							0.0085	2.80	0.01	-0.0000114	-2.24	0.03
CG _{t-1}				0.0396	3.10	0.00	0.000019	9.15	0.00						
i _t	0.97	17.74	0.00	1.18	8.48	0.00									
i _{t-1}							-0.7523	-3.23	0.00	-0.98	-1.97	0.05	1.4327	13.66	0.00
LOG(NER _t)	-5.74	-6.67	0.00	-4.93	-3.06	0.00	16.2341	6.82	0.00						
NER _{t-2}										0.21	2.84	0.01	0.0509	5.37	0.00
P _{t-1}										-0.82	-6.28	0.00	-1.9414	-6.64	0.00
Constant (ϕ)	-6.0480	-3.20	0.00	-36.45	-4.22	0.00	-89.26	-6.13	0.00	46.74	5.07	0.00	22.51	5.45	0.00
R-squared	0.74			0.57			0.53			0.46			0.82		
Adjusted R-squared	0.72			0.53			0.50			0.42			0.80		
S.E. of regression	2.8			8.4			7.6			15.4			14.0		
Sum squared resid	928.8			7874.3			6156.1			26017.6			21420.2		
Log likelihood	-302.7			-421.3			-392.0			-493.0			-481.3		
F-statistic	40.8			18.1			15.2			10.4			54.6		
Prob(F-statistic)	0.0			0.0			0.0			0.0			0.0		
Mean dependent var		-3.0			12.4			2.9			13.3			21.8	
S.D. dependent var		5.3			12.3			10.8			20.1			31.4	
Akaike info criterion		5.0			7.2			7.0			8.4			8.2	
Schwarz criterion		5.2			7.4			7.2			8.6			8.4	
Hannan-Quinn criter.		5.1			7.3			7.1			8.5			8.3	
Durbin-Watson stat		1.6			1.5			1.6			1.0			2.5	

aggregate investment and higher output, which shifts the “Philip curve” outwards with the tradeoff effects of accompanying higher inflation. The inverse relationship between government borrowing and inflation is also consistent with theory that increased government credit to meet consumption which crowds out private sector lending can potentially lower inflation, provided it is not sourced from the central bank or high powered money creation. This was sufficiently complemented by stable exchange rates policy and maintenance of real interest rates that have remained positive, a monetary condition fostered by less interference of fiscal authorities in monetary policy formulation and implementation. There is therefore the good prospect that the Gambia

would continue to meet the convergence criteria with the current monetary policy stance.

However, very little optimism can be expressed with respect to achieving inflation convergence to WAMZ area criteria, given their expansionary monetary policy stance. In the case of Ghana inflation is driven by highly expansionary monetary policies characterized by 37.6 percent average growth in money supply (M₂), overvalued exchange rates and negative real interest rates (see Table 3a). It is therefore not surprising that a positive and significant relationship is established between credits to government, interest rate policy and trends in exchange rate. The case of Guinea is more worrisome with a history of pursuit of highly expansionary monetary policies which resulted in an average of 86.7 per cent increase in money supply. During the period under review, money supply grew by 86.7 per cent sourced mainly through high-powered money creation. In spite of the country's commitment to keeping exchange rate and interest rates stable, the lack of fiscal restraints seemed to render monetary policies ineffective.

5. *Summary and Implications for Unionization Efforts*

This paper examines the determinants of inflation differentials from the set convergence criteria in West African Monetary Zone (WAMZ) states. Using a 5-country model of WAMZ area, the differences in national inflation is analyzed in light of country specific shocks or differences in the monetary transmission mechanisms. The main results show that macroeconomic (price) stabilization around a desired target was not attained. Over the sample period, the un-weighted average regional inflation rates were most often above a single digit target and vary widely among the countries. The major monetary policy instruments determinants of inflationary divergence are the pursuit of distorted interest rates, exchange rates overvaluation and expansionary monetary policies, which penalized credit and accentuated output supply/demand gaps.

The immediate implication of these findings is that there is very slim prospect for the attainment of price convergence by WAMZ countries in the foreseeable future. In particular, the divergent path of interest rates policies among the countries, with no clear cut policy rules and the didactic approach to exchange rates determination all points to this conclusion. This is reinforced by the pervasive internal economic distortion which accompanied the interest rates policy stance, especially the widened divergence between low savings rate which inhibits savings mobilization and high lending rates which resulted in credit apathy by both lenders and borrowers.

The finding that nominal exchange rate devaluation has relatively insignificant effect on inflation differential also implies that unwarranted emphasis was placed by these countries on exchange rate management. Although some independent national studies {IMF (2008); Balogun (2007); Égert, Ritzberger-Grunwald & Silgoner(2003)} suggest that it could be an important determinant of domestic inflation, it has not been effective as an instrument of demand management approach to price stabilization. This further suggests that these countries could be better off surrendering the inferior price stabilization approach to a supra-national monetary authority that compels compliance to a regional monetary and inflation targets.

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