How Relevant is Inflation Targeting in ECOWAS Common Currency Programme?

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Abstract: We examine the relevance of inflation targeting (IT) in the Economic Community of West African States' (ECOWAS) common currency using the stability of money demand function to determine appropriate monetary policy framework. We employed annual data from 2003 to 2022 and autoregressive distributed lag (ARDL) bound test approach and find the presence of a long-run relationship between money demand function and its determinants. The CUSUM and CUSUM of square tests reveal the stability of money demand for the selected countries. Monetary targeting is more appropriate for ECOWAS since member countries have stable money demand. Based on the findings, we recommend the adoption of integrated inflation targeting framework, which involves setting flexible reserve money targets and interest rate corridors, sustaining a flexible exchange rate regime, and strengthening prudential supervision and regulation to promote financial system resilience against exchange rate shocks. This approach would promote policy transparency and accountability from inception.

Keywords: Currency Union, Inflation Targeting, Money Demand Stability, ARDL.

Introduction

Currency union has become a common model for promoting globalization. The European Union experience, however, underscores the importance of a carefully designed and research driven protocols in the formation a currency union (Asongu et al., 2019). The ECOWAS Monetary Cooperation Programme which started in 1975 is designed in line with the European Union. Part of the institutional design is the adoption of a Federal Model for the common central bank, IT monetary policy framework, Eco as the name of the common currency, among others. The purpose of this study is to evaluate the appropriate monetary policy framework for the ECOWAS currency union.

Scholars generally disagree on the criterion or criteria for adopting an appropriate monetary policy framework. One strand of literature considers monetary targeting appropriate when money demand is stable; and interest rate or inflation targeting as ideal when money demand is unstable (Ujunwa et al., 2022; Folarin & Asongu, 2019; & Poole, 1970). This strand of literature contends that monetary targeting is the appropriate monetary policy framework in cash-based economies with less developed financial markets, while interest rate targeting is inappropriate in economies with developed payment system infrastructure and financial market, since interest rate is a natural example of opportunity cost. Moreover, adjusting inflation or interest rate target to predict stable money demand is difficult because, the opportunity cost of keeping money is exogenous to the money demand function, and information on cost of keeping money is reflected in several opportunities cost variables.

Another strand of literature argues that there is no feasible appropriate monetary policy framework in developing economies because of the presence of structural rigidities and the absence of relevant policy instruments (Asongu et al., 2019). Structural rigidities such as epileptic power supply, insecurity, obsolete technology, infrastructure deficit, and prohibitive cost of governance, are partly responsible for some of the inflationary pressures. These structural shocks result in high costs of production that is ultimately transferred to the final consumers, and ultimately renders the private credit channels and efforts towards influencing borrowing rates ineffective. IT and monetary targeting frameworks in such economy is counterfactual because monetary authorities do not have the instrument to influence

inflation outcomes. Similarly, controlling reserve money is ineffective since inflation is not majorly a monetary phenomenon (Fischer, 1985; Ball & Mankiw, 1995).

This raises an important policy question on *the appropriate monetary policy framework for the ECOWAS common central bank?* To contribute to the debate, we estimate the money demand function of ECOWAS countries using panel and non-panel ARDL technique relying on annual data from 2003 to 2022. While the sample size is the fifteen (15) ECOWAS member countries, we dropped the eight (8) countries that are members of the West African Economic and Monetary Union (WAEMU) - Benin, Burkina Faso, Côte d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal, and Togo. The WAEMU countries have a single central bank (Central Bank of West African States), share a common currency (the CFA franc), and absence of monetary policy independence because the CFA franc is pegged to the euro. We find the presence of a long-run relationship between the money demand function and its determinants. The CUSUM and CUSUM of square tests reveal the stability of money demand for the selected countries.

Given the findings of the study and the imperativeness of policy transparency, we recommend the adoption of integrated inflation targeting monetary policy framework. Promoting the central bank transparency from inception would improve the effectiveness of monetary policy and provides the basis for accountability.

The paper is structured as follows: Section 2 reviews related literature; section 3 discusses the data and estimation techniques; section 4 presents the results, and section 5 concludes the paper.

Literature Review and Hypothesis Development

ECOWAS Monetary Cooperation Programme

The ECOWAS Monetary Cooperation Programme started in 1987 with the objectives of promoting intra-ECOWAS trade and free movement of people and goods within the sub-region. ECOWAS has recorded significant progress in terms of the ratification of important trade protocols - ECOWAS Quality Programme and Standards; Harmonization of Indirect Taxes (Value Added Tax and Excise Tax); Harmonized Customs Documentation and Automated Clearance Procedures; Yamoussoukro Open Skies; Convention Relating to Inter-State Road Transit of Goods; ECOWAS Common External Tariff; Free Movement of Persons, Right of Residence and Establishment; ECOWAS Trade Liberalization Scheme; and ECOWAS Common Trade Policy – and institutional design of a common central bank. Despite the giant stride achieve so far, ECOWAS has consistently postponed the deadline for the adoption of common currency, due to the inability of member countries to comply with the macroeconomic convergence criteria (Tule et al., 2019).

To fast-track the establishment of the currency union, ECOWAS adopted a Modified Gradualist Approach in 2014, to replace the existing two-track approach. The modification is to allow countries that meet the macroeconomic convergence criteria to kick-start the union, while the other countries will be gradually admitted after complying with the convergence criteria. The deadline for the launch a single currency union was set for January 2020. The outbreak of COVID-19 in 2020, its adverse effect on the macroeconomic stability of member countries compelled ECOWAS to postpone the launch date to 2027. ECOWAS Technical Committee on Single Currency Programme redesigned a three phases programme for the implementation of the new roadmap. Phase I (2021-2023) is the development of harmonized or uniform legal frameworks as well as the operationalization of the framework; Phase II (2024) is the training, testing, and operationalization of the frameworks; and Phase III (2025) is the launch of the ECO.

The revision of the ECOWAS common currency roadmap has created the opportunity to review some of the institutional arrangements. ECOWAS has proposed inflation targeting for the common central bank. Revisiting the appropriateness of inflation targeting framework in ECOWAS has become extremely important due to the predominance of monetary targeting framework in ECOWAS (Tule et al., 2019), and the absence of institutional arrangement for inflation targeting. The current monetary policy framework of Nigeria, Gambia, Guinea, Liberia, and Sierra Leone is monetary targeting framework, while Ghana adopts the IT framework (Tule et al., 2019). WAEMU countries do not have an explicit monetary policy framework since the convertibility of their common currency is guaranteed by the French Treasury and pegged to the Euro.

Transiting to Inflation Targeting Framework

Bernanke & Mishkin (1997) defined inflation targeting as a constrained discretion or rule-like strategy that enables the central bank to focus on price stability while simultaneously addressing short-run macroeconomic fluctuations. The overall goal is to achieve a low and stable rate of inflation, while promoting transparency and accountability

(Roger, 2010). IT strategy involves public announcement of medium-term numerical targets for inflation; central bank commitment to price stability as the primary objective; information inclusive strategy for setting policy instruments; effective and transparent communication strategy on the plans, objectives, and reasons for the decisions; and mechanism for holding the central bank accountable for attaining its inflation objectives (Mishkin & Savastano, 2001).

The preconditions of IT adoption include institutional commitment to price stability, absence of fiscal dominance, adequate level of financial market development and a limited scale of currency substitution; no simultaneous exchange rate target; and adequate analytical resources (Narodowy, et al., 2019). The necessity of the preconditions emerged when IT spread to emerging market economies (EMEs), because lack of technical capacity and central bank independence (Eichengreenet, et al., 1999). Batini & Laxton (2006) argued that EMEs must not necessarily meet the preconditions before adopting IT framework, rather the emphasis should rest on "the authorities' commitment and ability to plan and drive institutional changes after introducing IT". This suggests that post-adoption conditions seem more critical than pre-adoption conditions to the attainment of the target's objectives.

The increasing popularity of IT could be traced to the successes recorded by early adopters in advanced economies. For instance, New Zealand successfully migrated from a high and volatile inflation regime to low inflation with a high rate of growth after the adoption of IT framework. Also, Canada, UK, Australia, and Sweden recorded relative success after adopting IT Framework. Proponents of IT identified the success factors ad low and stable inflation, a more anchored inflation expectation, better growth performance, lower sacrifice ratio, transparent policy, improved communication, and increased accountability (Bernanke and Mishkin, 1997; Bernanke et al., 2000). The experiences of IT adopters in emerging and developing economies like Ghana, Chile, South Africa, Kenya and Argentina exemplify a contrasting outcome. This development may be traced to the structure of the economies. Morozumi et al., (2020) opined that the effectiveness of IT depends on income level and central bank's instrument independence. The lack of flexibility to adjust policy instruments, due to low instrument independence hinders the central bank from effectively anchoring inflation target. Low instrument independence is prevalent in low-income countries (LICs) compared, which may make IT framework less effective.

On the empirical front, Amira et al. (2013) found a significant positive impact of IT on economic growth. Their results, however, did not support a stable growth rate. Nene et al., (2022) found that European countries benefit more from IT adoption compared to African countries due to the higher impact of IT on reducing inflation uncertainty and promoting economic growth, which they attribute to superior economic standards and inflation dynamics of European countries. Ayres et al., (2014) and Duong (2021) document that IT adoption does not support economic growth but contains inflation. There is no known empirical evidence linking IT post adoption preconditions fulfilment economic performance. Studies have shown that episodes of crises promote IT adoption (Claeys, 2015; Laurens, et al., 2015). The G7 countries switched to IT after the episodes of high inflation and public debts.

Money Demand Stability and Inflation Targeting

The theory of money demand stability has evolved from the Keynesian motives of holding cash to the post-Keynesian theory championed by Baumol (1952) and Tobin (1956), to the modern quantity theory of money by Friedman (1956). While Keynes (1936) posits that an economic agent prefers liquidity for transactional, precautionary, and speculative motives; the post-Keynesians focused on the central bank's control of money stock via the interest rate since money supply is a function of credit demand. Friedman's quantity theory of money posits that "money does matter"; and perceives money both as a medium of exchange and as an asset. By this, demand for money is determined by the volume of wealth, return on assets, and choice of an asset. The implicate "price level, real income, rate of interest, and rate of increase in the price level" are the determinant variables of money demand except for the human capital component of the cost of holding money.

Money demand function, therefore, forms the basis for determining the appropriate exchange rate frameowk. Cobham & Song (2020) find significant influence of IT post 2007/2008 global financial crisis in both developed and emerging economies on the money demand stability. Bahmani-Oskooee & Gelan (2009) find stable money demand in Africa, while Asongu, et al (2018) and Asongu, et al (2020) find variation in the stability of money demand across African countries. On ECOWAS, Asongu et al (2018) find short run change in the inflation rate has negative implications on money demand. Edeme et al. (2019) shows that controlling the quantity of money in the economy is superior to the interest rate as a monetary policy instrument in Nigeria independently, but the combination gives optimal results.

Integrated Inflation Targeting Framework

The key lesson from the literature review is that supply-side shocks, currency fluctuations, and changes in global commodity prices adversely affect the ability of central banks to achieve inflation targets in emerging markets and developing economies under IT framework. In contrast, monetary targeting is not effective in promoting transparency and policy accountability. The contrasting performance of IT in emerging markets and developing and the need to promote transparency and policy accountability influenced Bank for International Settlements (BIS) to propose the novel integrated or flexible Inflation Targeting framework (Dridi & Boughrara, 2023). The integrated IT framework aims to provide developing countries with a more comprehensive and effective approach to achieving price stability (Agénor & Pereira da Silva, 2023).

Integrated IT is a significant departure from traditional inflation targeting frameworks that advocates for a more holistic approach which incorporates a broader range of economic indicators and policy tools. This includes monitoring and managing various inflation measures, exchange rates, financial conditions, and external shocks that can impact the domestic price level. Integrated IT is also suitable for monetary targeting countries that are gradually transitioning to full-fledged. The Potential benefits include improved inflation control, managing external control, enhanced resilience and increased policy credibility (Akram & Eitrheim, 2008).

Evidence from the literature also shows there is no previous scholarly investigation on the appropriateness of the IT framework in a currency union. This study fills the lacuna by examining the basis for adopting a common monetary policy framework in ECOWAS.

Data and Methodology

Data

The study covers ECOWAS countries with emphasis on countries with explicit monetary policy frameworks – Gambia, Ghana, Guinea, Liberia, Nigeria, and Sierra Leone. The absence of an explicit monetary framework informed the decision to drop WAEMU countries from the observation. This is supported by the Mundell (1963) and Fleming (1962) trilemma hypothesis that it is impossible for any of monetary authorities to achieve an independent monetary policy, free capital mobility, and a fixed exchange. We used annual data on broad money (M2), consumer price index (CPI), real effective exchange rate, real GDP, and the United States Monetary Policy Rate for the period, 2003 to 2022. All data were sourced from the World Development Indicators and International Financial Statistics.

Methodology

The liquidity preference theory of Keynes (1936) evidently captures the relevance of money demand in the formulation of macroeconomic policies. The liquidity preference theory is expanded by assigning different variables to the motives - transactionary, speculative, and precautionary. For transactionary and precautionary motives, the demand for money, incomes and price level increase vary directly while for speculative motive, opportunity cost of holding money, traditionally measured with interest rate, inflation rate and exchange rate is the determinant of liquidity of liquidity preference (Joesph, et al., 2013). The relationship of the determinants of money demand can be represented thus:

$$\left(\frac{M}{P}\right) = f(y, i) \quad (1)$$

Equation (1) above is interpreted as: M/P - real demand for money - is a function of y - real income - and *i* - opportunity cost of holding money (Folarin & Asongu, 2019). This model forms the bedrock for the estimation of the stability of money demand.

We re-express Eq. (1) in a long run form as:

$$LRMB_t = \delta_0 + \delta_1 LRY_t + \delta_2 LCPI_t + \delta_3 LREER_t + \delta_4 LUSMPR_t + \varepsilon_t. \quad (2)$$

where *RY is real income, CPI* is consumer price index, *REER* is real effective exchange rate, *USMPR is US Monetary Policy Rate*, *δs* are the coefficients of the variables, *ε* is the residual term, and *t* is time. Theoretically, the signs of δ_2,δ_3, and δ_4 are expected to be negative, while δ_1 is positive. The prefix L shows that the variables are represented in their natural logarithmic form.

The estimation processes follow some four considerations: The first consideration is the evaluation of the distributional properties of the datasets and other time series properties which are important in stating a model designed to unveiling specification bias. The stationarity properties are evaluated using the ADF breakpoint consistent unit root tests[1] for the country-specific time series (i) (see Eq.3):

$$Y_t = {}_{\gamma} + \partial D\mu_t + \theta D\,(Tb)_t + \alpha\tilde{y}_{t-1} + \sum_{j=1}^{k} cj\Delta y_{t-j} + \varepsilon_t \quad (3)$$

For the panel series(it), the Im, et al., (2003) hereafter referred to as IPS which follows a heterogeneous process in panel unit root test is used. The choice is because it serves as an alternative to the tests with homogeneity assumption[2]. The IPS framework for each cross-section is given thus:

$$\Delta y_{it} = \alpha y_{it-1} + \sum_{j=1}^{\rho_i} \beta_{ij}\Delta y_{it-j} + X'_{it}\delta + \epsilon_{it} \qquad (3)$$

Where $H_0: \alpha_i = 0, for\ all\ i$

$$H_i: \begin{cases} \alpha_i = 0 & for\ i = 1, 2, \ldots\ldots\ldots, N_1 \\ \alpha_i < 0 & for\ i = N+1,\ N+2, \ldots, N \end{cases}$$

Following Im, et al. (2003), the average of the t-statistics from all the cross sections becomes the decision parameters for the stationarity of the panel of the studied countries. The use of the time series and panel unit root tests help the comparison of the country-specific unit root properties against the pooled/panel series.

The main model estimation follows Pesaran, et al, (2001) ARDL cointegration model. The Pesaran, et al. (2001) has several advantages over other cointegration models which include: its efficiency in the face of small samples, its acceptance of different lag structures for both the dependent and independent variables, and its proclivity to combine I(0) and I(1) variables, (Arize, et al., 2018). Work by Pesaran and Shin (1997) shows the ARDL model as

$$\phi(L,p)y_t = \sum_{i=1}^{k}\beta_i(L,p)x_{it} + \delta' w_t + \mu_t \qquad (4)$$

Where,

$$\phi(L,p) = 1 - \phi_1 L - \phi_2 L^2 - \cdots - \phi_p L^p \quad \text{and}$$

$$\beta_i(L,p) = \beta_{i1} + \beta_{i1}L + \beta_{i2} + \cdots + \beta_{iqi}L_i^q\ i = 1,2, \ldots, k \qquad (5)$$

L is a lag operator with $LY_t = y_{t-1}$, and w_t is a vector of deterministic variables like intercept term, dummy variables, time trends or exogenous I(1) variables with fixed lags.

Next, is the determination of the long-run coefficients that relate to the exogenous variables with fixed lags as follows:

$$\hat{\gamma} = \frac{\widehat{\alpha}(\hat{\theta}, \hat{\vartheta}_1, \hat{\vartheta}_2, \ldots, \hat{\vartheta}_k)}{1 - \hat{\phi}_1 - \hat{\phi}_2 - \cdots - \hat{\phi}_p} \qquad (6)$$

where: $\widehat{\gamma}(\hat{\theta}, \hat{\vartheta}_1, \hat{\vartheta}_2, \ldots, \hat{\vartheta}_k)$ are the OLS estimates for the ARDL framework? For the linear "long-run and short-run model" the equation is specified as:

[1] We follow the determination of the break-date as caused by an innovational outlier which is a gradual outlier that gradually innovates through the whole process.

[2] Tests such as Levin, Lee and Chu (2002) and others assume cross-sectional homogeneity and follow that only evidence against non-stationary null in one series is required to reject the joint null. This assumption has been adjudged to be economically meaningless and implausible given that it assumes that all the series have the same autoregressive dynamins (see, Brooks 2014).

$$\Delta LRMB_{it} = \alpha_1 + \sum_{i=1}^{p} \delta_i \Delta LRMB_{it-i} + \sum_{l=0}^{s} \theta_l \Delta LRY_{it-l} + \sum_{j=0}^{q} \tau_j \Delta LCPI_{it-j} + \sum_{l=0}^{r} \theta_l \Delta LREER_{it-l} + \sum_{l=0}^{s} \theta_l \Delta LUSMPR_{it-l} + \gamma_p LCRMB_{it-1} + \gamma_q LRY_{it-1} + \gamma_r LCPI_{it-1} + \gamma_s LREER_{it-1} + \gamma_t LUSMPR_{it-1} + \xi_{it} \quad (7)$$

The subscript (it) is indicative that the model is also used for the cross-section.

Thirdly, we examined the speed of adjustment of real money balance to disequilibrium emanating from the explanatory variables using the error correction representations. Finally, we examined the stability of the model. Extant literature is in consensus that in the estimation of the money demand model, interest should not just be at the degree and direction of the money demand influencers, but also the stability of the overall model. We considered the stability of the model important and deployed some diagnostic tests such as the BPG Heteroscedasticity Test, BG higher-order autocorrelation tests, Ramsey RESET Test including the CUSUM and CUSUM-squared graphs. These tests not only justified the assumptions underlying the chosen estimators, but it also removed every suspicion of parameter and specification instabilities/biases in the model.

Discussion of Results

First, we present the pre-estimation test to determine the goodness of the series for the chosen estimation methods. Table 1 shows the descriptive statistics for the individual countries and pooled data.

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TABLE 1: COUNTRY SPECIFIC AND PANEL DESCRIPTIVE STATISTICS								
		NIGERIA	**S/LEONE**	**GHANA**	**GAMBIA**	**LIBERIA**	**GUINEA**	**PANEL**
LCPI	$\bar{x}$	4.90	4.75	4.82	4.73	4.77	4.86	4.80
	Med	4.90	4.74	4.76	4.70	4.76	4.95	4.77
	Max	5.51	5.37	5.58	5.11	5.52	5.52	5.58
	Min	4.30	4.29	4.04	4.41	4.15	3.91	3.91
	σ	0.34	0.29	0.46	0.21	0.35	0.45	0.38
	$\tilde{\mu}_3$	0.08	0.41	0.05	0.25	0.15	-0.31	0.12
	Kurt	2.02	2.34	1.89	1.91	2.30	1.87	2.16
	CV	0.07	0.06	0.10	0.04	0.07	0.09	0.08
LREER	$\bar{x}$	5.20	8.39	0.69	3.51	4.37	8.77	5.96
	Med	5.06	8.38	0.63	3.47	4.29	8.84	6.86
	Max	5.72	9.02	1.56	3.91	5.05	9.13	9.13
	Min	4.76	7.99	-0.09	2.95	4.04	8.12	-0.09
	σ	0.31	0.32	0.57	0.26	0.24	0.26	2.93
	$\tilde{\mu}_3$	0.79	0.42	0.15	-0.15	1.07	-0.42	-0.69
	Kurt	2.26	2.19	1.59	2.04	3.70	2.36	2.21
	CV	0.06	0.04	0.82	0.07	0.05	0.03	0.49
LRY	$\bar{x}$	20.46	15.75	18.21	14.95	15.42	16.50	25.51
	Med	20.62	15.71	18.24	14.96	15.42	16.42	27.43
	Max	20.84	16.16	18.64	15.28	15.64	16.94	29.74
	Min	19.83	15.41	17.95	14.71	14.99	16.17	17.33
	σ	0.32	0.21	0.19	0.18	0.15	0.24	3.86
	$\tilde{\mu}_3$	-1.02	0.37	0.32	0.20	-0.73	0.44	-0.85
	Kurt	2.52	2.45	2.33	1.68	3.33	1.79	2.21
	CV	0.02	0.01	0.01	0.01	6.31	0.02	0.15
LUSMBR	$\bar{x}$	0.51	1.24	1.24	1.24	1.24	1.24	-0.86
	Med	0.13	0.13	0.13	0.123	0.13	0.13	-2.08
	Max	2.25	5.25	5.25	5.25	5.25	5.25	1.66
	Min	0.13	0.13	0.12	0.13	0.13	0.13	-2.08
	σ	0.67	1.76	1.75	1.76	1.76	1.76	1.47
	$\tilde{\mu}_3$	1.54	1.47	1.47	1.47	1.47	1.47	0.61
	Kurt	3.84	3.66	3.66	3.66	3.66	3.66	1.69
	CV	1.31	1.14	1.41	1.42	1.42	1.42	0.61
LRMB	$\bar{x}$	24.20	22.55	17.58	17.32	13.73	23.74	21.81
	Med	24.17	22.72	17.69	17.39	13.77	23.84	20.97
	Max	24.38	23.06	18.16	17.50	14.12	23.99	25.69
	Min	24.07	21.74	16.64	16.90	13.18	23.20	19.38
	σ	0.09	0.44	0.47	0.20	0.27	0.25	1.85
	$\tilde{\mu}_3$	0.52	-0.60	-0.42	-0.81	-0.52	-0.93	0.92
	Kurt	2.18	1.89	1.82	2.17	2.18	2.48	2.47
	CV	0.003	0.02	0.03	0.01	0.02	0.01	0.08

A comparison of the panel averages with the country-specific averages revealed the existence of no marked difference, as the mean, median, minimum and the maximum fall within the panel averages. True to the behaviour of most financial time series, a predominantly positively skewed set of observations are observed with kurtosis that falls below the acceptable threshold of 3 (fat-tailed to the left). All the panel and stylized standard and relative deviations of the series show that the distributions are closely distributed around the mean.
Table 2 reports the results of the unit root test in both panel and time-series dimensions. The breakpoint consistent unit root tests following the ADF framework for the country-specific and panel series satisfy the condition for the use of ARDL. The stationarity properties of the series show I(0) and I(1) orders of integration with break dates falling within periods leading to and following the global financial crises.

Table 2: Summary of Unit Root Tests (Panel and Time Series Dimension)

		NIGERIA	S/LEONE	GHANA	GAMBIA	LIBERIA	GUINEA	PANEL
CPI	ADF STAT	-5.68	-6.47	-5.83	-6.73	-8.52	-9.11	IPSW-STAT 11.14 P-VALUE - 0.000
	CV@5%	-5.18	-5.18	-5.18	-5.18	-5.18	-5.18	
	PVALUE	0.01	<0.01	< 0.01	< 0.01	< 0.01	< 0.01	
	BREAK DATE	2015Q2	2015Q3	2009Q2	2013Q3	2016Q4	2009Q4	
RMB	ADF STAT	-4.79	-5.19	-5.84	-6.69	-5.73	-8.04	IPSW-STAT 3.07 P-VALUE - 0.0011
	CV@5%	-4.51	-5.18	-5.18	-5.18	-5.18	-5.18	
	PVALUE	0.02	0.05	< 0.01	< 0.01	< 0.01	< 0.01	
	BREAK DATE	2013Q2	2016Q3	2013Q4	2007Q3	2012Q4	2009Q3	
RY	ADF STAT	-5.45	-5.07	-5.65	-6.58	-8.31	-5.39	IPSW-STAT 2.41 P-VALUE - 0.0080
	CV@5%	-5.18	-4.27	-5.18	-5.18	-5.18	-5.18	
	PVALUE	0.02	< 0.01	0.01	< 0.01	< 0.01	0.03	
	BREAK DATE	2016Q1	2016Q1	2013Q1	2010Q4	2009Q2	2008Q4	
USMPR	ADF STAT	-5.43	-5.74	-6.91	-6.91	-6.91	-6.91	IPSW-STAT 7.93 P-VALUE - 0.000
	CV@5%	-5.18	-5.18	-5.18	-5.18	-5.18	-5.18	
	PVALUE	0.02	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
	BREAK DATE	2009Q1	2008Q3	2018Q2	2018Q2	2018Q2	2018Q2	
REER	ADF STAT	-12.00	-5.07	-6.28	-12.09	-8.25	-6.93	IPSW-STAT 7.21 P-VALUE - 0.000
	CV@5%	-5.18	-4.86	-5.13	-5.18	-5.18	-5.18	
	PVALUE	< 0.01	0.03	< 0.01	< 0.01	< 0.01	< 0.01	
	BREAK DATE	2015Q3	2011Q1	2015Q2	2007Q3	2014Q1	2010Q4	

Table 2 presents the specified money demand equation emphasizing the linkage of real money balance with the foreign interest rate, exchange rate, and inflation variables. Income elasticity is significantly positive and indicative of the fact that an increase in money balance responds positively and significantly to an increase in economic activity (income). This is the case for all the selected countries except for Ghana which reported a negative income elasticity of 0.53. The statistically significant effect of income on money demand indicates that economic agents demand money largely for transactional purposes. This may explain the predominance of a cash-based economy in West Africa.

The sign for the exchange rate in Nigeria and Guinea supports the theory that domestic currency depreciation promotes currency substitution in the two countries. Conversely, there is a positive relationship between money demand and exchange rate in Ghana, Liberia, Sierra Leone, and The Gambia. This could be attributed to the peculiar characteristics of these economies. In Liberia for instance, the Liberian dollar (domestic currency) and United States dollar serve as legal tender and float side by side. Such economic condition eliminates seethe sensitivity of the exchange rate to liquidity preference since economic agents predominantly hold United States Dollars as domestic currency. The relatively low variability in the exchange rate in Sierra Leone, Ghana and the Gambia within the period under review and maybe, the already existing high incidence of currency substitution may have influenced the result.

Inflation rate elasticity is found to maintain a consistent behaviour across the West African Monetary Zone. The negatively significant elasticity of money demand to inflation across the countries reinforces the importance of the monetary targeting framework in ECOWAS and the need to use broad money as the nominal or intermediate anchor in stabilizing the relative price level. This agrees with the findings of Ryczkowski (2021) who found a weak and statistically insignificant relationship between money demand and inflation for 16 full-fledged IT countries. The sensitivity of the inflation rate to money demand shows that with high inflationary pressure, holding alternative assets that are less sensitive to inflationary pressure would be preferred by economic agents as alternative to holding cash. This is in line with the portfolio shift theory.

The foreign interest rate elasticity is negatively and significantly related to money demand in all the investigated countries. This indicates that to a reasonable extent, the vulnerability of ECOWAS economies to external shocks. The decision to use the United State Federal Reserve rate is in line with the consensus in Nigeria that the US monetary policy rate should serve as a specimen for measuring vulnerability to external shocks (Tule et al., 2019). The results also signal that economic agent in West Africa would naturally prefer to hold foreign instruments with higher yields when the foreign interest rate is high, over domestic currencies.

To measure the long-run stability of the money demand function in the ECOWAS as well as the dynamic profile of the investigated variables, the bounds test cointegration test, as well as the error correction representations for all the countries are presented in Table 2. The FPSS for all the countries is found to be greater than the upper bound I(1) which is evidence in favour of cointegration and long-run relations in the money demand equation for all the six countries. The error correction term shows that all the estimates are significant and enters with the expected sign. The fact that the error correction term is rightly signed shows that money demand adjusts to the dynamics of the exogenous variables. The adjustment speed to restore long-run equilibrium due to short-run disequilibrium is approximately 14%, 58%, 37%, 66%, 52% and 14% from the previous quarter to the current quarter respectively for Gambia, Ghana, Liberia, Guinea, Nigeria and Sierra Leone. The fact that the error correction terms fall below unity (1) shows that the money demand equation for the countries falls within predictable limits and yields plausible predictions.

Lastly, the diagnostic tests which form a vital part of the estimation processes in money demand are reported in table 3. Given that money demand estimations are best done in stable monetary conditions, determining the validity, stability and reliability of the money demand estimators are of great importance. The Lagrange multiplier (LM) statistic, which is distributed as χ 2 removes the suspicion of autocorrelation of the residuals in all the country models. Ramsey RESET tests show correct models specification while the heteroscedasticity tests remove every suspicion of non-constant variance of the residual. The goodness of fit of the estimators is confirmed by the reported R-squared which can be adjudged to be rightly sized.

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Table 3: Summary of Country-Specific ARDL Estimates

i = GAMBIA					i = GHANA			
LRMB = f(LCPI,LREER, LRY,LUSMPR)					LRMB = f(LCPI,LREER, LRY,LUSMPR)			
Parameters	Coeff	T-Stat	Std.Error	Pvalue	Coeff	T-Stat	Std.Error	Pvalue
LCPI	-1.66	2.46	0.68	0.0197	-0.18	1.22	0.15	0.2687
LREER	2.62	4.56	0.57	0.0001	0.87	6.29	0.14	0.0008
LRY	0.49	2.28	0.22	0.0295	-0.53	7.41	0.07	0.0003
LUSMPR	-0.07	3.03	0.02	0.0049	-0.04	15.86	0.002	0.0000
ECM	-0.14	5.03	0.03	0.0000	-0.58	21.80	0.03	0.0000
DIAGNOSTICS								
F	4.48				43.19			
LM	0.23				1.35			
RESET	0.71				1.28			
HET	1.16				0.63			
CS/SS	STABLE				STABLE			
R-Squared	0.85				1.00			
i = GUINEA					i = LIBERIA			
LRMB = f(LCPI,LREER, LRY,LUSMPR)					LRMB = f(LCPI,LREER, LRY,LUSMPR)			
PARAMETERS	COEFF	T-STAT	STD.ERROR	PVALUE	COEFF	T-STAT	STD.ERROR	PVALUE
LCPI	-3.56	2.94	1.21	0.0217	-0.69	2.55	0.27	0.0191
LREER	-0.45	0.32	1.42	0.7595	2.13	4.62	0.46	0.0002
LRY	0.09	0.06	1.56	0.9576	1.53	6.83	0.22	0.0000
LUSMPR	-0.15	2.94	1.21	0.0217	-0.06	3.29	0.02	0.0037
ECM	-0.37	7.84	0.05	0.0001	-0.66	6.44	0.10	0.0000
DIAGNOSTICS								
F	7.82				5.53			
LM	2.35				0.55			
RESET	0.31				0.53			
HET	0.22				0.75			
CS/SS	STABLE				STABLE			
R-Squared	0.99				0.92			
i = NIGERIA					i = SIERA LEONE			
LRMB = f(LCPI,LREER, LRY,LUSMPR)					LRMB = f(LCPI,LREER, LRY,LUSMPR)			
PARAMETERS	COEFF	T-STAT	STD.ERROR	P-VALUE	COEFF	T-STAT	STD.ERROR	PVALUE
LCPI	-1.20	273.27	0.00	0.0023	-1.66	2.46	6.68	0.0197
LREER	-1.61	150.91	0.01	0.0042	2.62	4.56	0.57	0.0001
LRY	0.12	13.18	0.01	0.0482	0.49	2.28	0.22	0.0295
LUSMPR	-0.01	20.20	0.00	0.0315	-0.07	3.03	0.02	0.0049
ECM	-0.52	7.14	0.07	0.0002	-0.14	5.03	0.03	0.0000
DIAGNOSTICS								
F	4.96				4.48			
LM	2.97				0.23			
RESET	0.29				4.75			
HET	0.75				1.16			
CS/SS	STABLE				STABLE			
R-Squared	0.97				0.85			

Conclusion and Policy Implications

The extension of the deadline for the ECOWAS Monetary Cooperation Programme (EMCP) to January 2027 and the adoption of a three-phase programme for the implementation of the new roadmap by the Technical Committee on ECOWAS Single Currency Programme, provided the opportunity to review the adopted institutional arrangements of ECOWAS common central bank. One institutional arrangement that has generated serious debate is the adoption of IT framework. Indeed, a common central bank would assist the zone in anchoring inflation expectations, facilitating labour market reforms, mitigating ECOWAS economies' vulnerabilities to external shocks, and promoting fiscal discipline. To tap these benefits, the common monetary policy framework must be carefully crafted based on macroeconomic fundamentals to promote the resilient currency union.

Our findings have serious implications for ECOWAS countries after the attainment of a monetary union. The discovery that the coefficient of income, in the long run, is above one in Liberia and approaching unity (1) in other countries except Guinea indicates that money is mostly held for transactional purposes (primary exchange) in ECOWAS. How effective is inflation targeting in promoting price stability in such economies? More importantly, our result revealed that money demand falls when the consumer price index increases. The sensitivity of broad money to the elasticity of inflation (opportunity cost of holding money) is largely due to the larger parts of broad money – time and savings deposits. We also establish the varying degrees of substitution effect across the countries.

The presence of substitution effect of varying degrees across countries, with consistent negative elasticities of consumer price index, on a face value appears contradictory. For instance, in Ghana, Liberia, Gambia and Sierra Leone, we could not establish a substitution effect despite the negative effect of inflation on the demand for money. This finding could be explained by a high degree of currency substitution in the countries and relatively stable exchange rate for the review period (IMF, 2015; and Doblas-Madrid, 2009). Economic agents in such economies could invest in other non-financial assets such as a mortgage in the absence of a developed financial market.

Inflation targeting involves the setting of medium-term targets for inflation, with a corresponding commitment to price stability as the focus of monetary policy while other goals are subordinated. The sampled economies are broadly classified as low-income countries and may require broadening flexibility in stimulating growth. This is consistent with the findings of Gonçalves and Salles (2008) that while inflation targeting regime leads to a greater drop in inflation, it constrains the flexibility for growth and dealing with adverse shocks. Experimenting with collective commitment and the ability of the authorities to drive institutional change after introducing targeting might not be the right policy mix.

From our findings, stable money demand signal monetary targeting as the effective monetary policy framework for promoting price stability in ECOWAS. Monetary targeting allows the common central banks to design policies to provide liquidity to support investment and growth in ECOWAS. However, monetary targeting would not promote transparency and policy credibility, which is critical to effectively anchor expectation. Prasad % Songwe (2021) opined that sufficiently strong economic and institutional foundations are important for the establishment of a monetary union. The lingering disharmony between regional policies and domestic policies, and the stability of money demand in the sub-region is an indication that member states need to adopt a hybrid approach to monetary policy framework.

On the basis of the above, we recommend the adoption of the integrated IT framework for ECOWAS. Integrated IT is a transitory monetary regime between monetary targeting (MT) and ITM and involves setting flexible reserve money targets and interest rate corridors, in addition to sustaining a flexible exchange rate regime, and strengthening prudential supervision and regulation is also crucial to ensure financial system resilience against exchange rate shocks.

Declaration

Conflict of interest

The authors declare that there is no conflict of interest, and they have no financial interests

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