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The Co-Movement between Foreign Reserves, Economic Growth and Money Supply: Evidence from the WAMZ Countries

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Abstract

This paper analyses the impact of foreign currency reserve and economic growth on money supply, using a panel data of five West African Monetary Zone (WAMZs) member states from 2001-2019. The study employed the dynamic Panel techniques (Fully Modified Ordinary Least Square and Dynamic Ordinary Least Square) and the Static method (Fixed Effect model) for robustness check. The long run results showed that foreign currency reserves (FCR) have a positive impact on money supply, implying that a one percent increase in foreign currency reserves augments money supply (M2) by 2.87%, 0.44% and 0.08%, respectively in the long run. Similarly, economic growth is associated with an increase in money supply in both models. Furthermore, the Dumitrescu and Hurlin Causality (2012) estimation revealed a feedback association between foreign currency reserve and money supply. This means that that foreign reserves and money supply are complementary. Conversely, a unidirectional causality moving from economic growth to M2 is observed, demonstrating that economic growth causes M2 and not otherwise.

This outcome is explained by the QTM (quantity theory of money) in which the velocity of money is a positive function of total money supply. As money circulates in the economy as a result of a surge in investments, consequently increases money stock. Similarly, investment opportunities that are been exploited day-by-day explains the growing money stock.[1] Central banks should endeavor to monitor the expansionary influence of net foreign assets (NFA) on money supply growth in the WAMZ by establishing suitable methods to sterilize foreign exchange infusions into the economy.

Keywords: *foreign currency reserve, money supply, economic growth, WAMZ, Dynamic Model , Static Model*

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1.0 Introduction

This paper intends to utilize an appropriate method to provide empirically the impact of foreign currency reserve and economic growth on money supply, using a panel data of five West African Monetary Zone (WAMZs) member states. The study intends to use FMOLS and DOLS; and Static method to analyses the causal link between foreign currency reserve and economic growth on money supply.

The WAMZ policymakers have utilized fiscal and monetary policy mechanisms as a guide to countries economic policies in reaction to the economic situation and public finance. Thus, one of the convergence criteria of WAMZ is the accumulation of foreign reserves. The level of foreign reserves remains adequate on average in the WAMZ block, and some monetary authorities are actively accumulating foreign reserves for buffers especially now that countries are more often than before vulnerable to external and domestic shocks. Accumulation of foreign reserves is key for the WAMZ members to attain as one of the WAMI convergence criterion. The Member States' - The Gambia, Ghana, Guinea, Nigeria and Sierra and Liberia, gross external reserves level, as at end-June 2019, exceeds 3 months of import cover (WAMI, 2019).

Money supply grows moderately although still strong, supported by foreign asset position of the banking system and sustained economic growth (GDP) which is the focus of monetary policy in all the Member States. Money supply recorded double-digit growth in all the Member States: The Gambia (24.4 percent), Ghana (22.1 percent), Guinea (16.5 percent), Nigeria (12.4 percent) and Sierra Leone (15.9 percent), at end-June 2019 (WAMI, 2019). All the Member States, except Ghana, adopted monetary targeting framework, while the latter employed the inflation targeting frameworks. Monetary targeting framework targets reserve money as primary instrument to influence broad money (intermediary) and inflation (desired goal). Therefore, the monetary targeting framework suggests a positive relationship between the growth in reserve money, broad

money and price changes. Thus, the reserve accumulation cannot be justified by investments (portfolio) or stabilization objectives. There are evidence that foreign reserve accumulation plays a crucial role in money growth, especially those endowed with natural resources (Liu and Zhe (2008) in the case of China; Azar (2014) in Lebanon using the GARCH models; and Joof & Tursoy (2020) in the case of the Gambia employing the ARDL model).

The paper contributes to literature in twofold. Firstly, having observed the growth in money supply and foreign reserve, coupled with the soaring inflation rates in The Gambia, and Central Bank of The Gambia mandate to ensure price stability and accumulation of foreign reserve and ensure economic growth, this called for thorough investigation on the nexus among money growth, foreign reserve and economic growth, and to determine whether in CBG's quest to boost foreign reserve and growth will money supply spur?. According to authors' knowledge, no study investigated the long-run accumulation of foreign reserves and economic growth on money in the WAMZ region. The few prevailing papers on the topic such as: (Onyeiwu, 2012; Chinuba et al., 2015; Adi and Riti, 201; Joof and Tursoy, 2020) were not conducted on WAMZ countries, the closest study to this paper is Joof and Tursoy (2020) who only tested the influence of foreign reserve on M2, while ignoring economic growth. Furthermore, the above mentioned studies focus on time series estimations. However, this paper a panel data of five countries using the dynamic models (Fully Modified OLS and Dynamic OLS) and the static model (fixed effect model). The using of the dynamic panel is justifiable because, FMOLS has superiority over the Engle and Granger (EG) techniques as it applies appropriate correction of inference problems posed by the EG method and its long-run estimates are valid and the main idea for FMOLS and DOLS estimators is to deal with endogeneity problems and auto correlation. One of the main limitations of the study is data constraints which range from 2001-2019; this might not cover certain historical economic cycles of Central Banks monetary policies.

The rest of the paper is organized the in following sections: section two entails the Background of WAMZ. Section three includes the theoretical and empirical review, whereas section four shows the methodology. Section five revealed the data presentation, findings and discussions, while section six shows the conclusion and recommendations.

2.0 Background on West Africa Monetary Zone (WAMZ)

In 2000, in order to fast-track integration, another monetary zone known as the West African Monetary Zone (WAMZ) was established to work towards the convergence of the currencies of the economies of WAMZ with the aim of aligning with the CFA to have a single currency for the region.

The WAMZ consists of The Gambia, Ghana, Liberia, Nigeria and Sierra Leone. An agency called the West African Monetary Institute (WAMI) was created to drive the process. WAMI was to ensure the convergence of the currencies of the six countries—the goal post for achieving a common currency has been shifted several times. The last deadline was the year 2020. The attempt to shift the 2020 deadline was resisted by the Heads of States and Governments.

3.0 Literature Review

3.1 Foreign Reserves Nexus Money Supply

There is an abundant of empirical literature on the determinants of money supply see (Liu and Zhe (2008; Azar, 2014; Joof & Tursoy, 2020). However, there are very few studies that have looked at the effects of international reserves and economic growth on money growth in the WAMZ member countries. Efforts have been dedicated to this matter over the last decade as a result of its importance in harmonization toward single currency within the WAMZ blocks. Furthermore, WAMA (2009) explores the correlation between money supply and output for all the 15 ECOWAS countries. The study showed that the percentage increases in broad money supply was higher than the corresponding GDP growth rates. However, increase in net foreign assets (NFA) also accounted, more often, for liquidity growth in Niger, Burkina Faso, Guinea Bissau, Nigeria, Sierra Leone and Liberia.

Joof and Tursoy (2020) investigated “the mystery behind foreign currency reserve sterilization in the Gambia” using the Autoregressive Distributed Lag (ARDL), FMOLS and “Granger causality” on time series from 2002:M1-2019:M12. They highlighted a positive association amid foreign reserves and M2. They, furthermore, confirm a bidirectional relationship amid the M2 and foreign currency reserve. Azar (2014) investigates “Foreign Reserve Accretion and Money

Supply Creation" in the case of Lebanon using a generalized autoregressive conditional heteroskedasticity (GARCH) model from 1991-2014. The paper found that foreign exchange reserve holds a positive correlation with M2 in the long run. Liu and zhe (2008) examined the association amid foreign reserve and M2 in China, and evidence showed that foreign reserve augments money supply due to the mutual long run and short run equilibrium. The causality analysis revealed bidirectional causation.

Based on the literature, we can say that the liaison between foreign reserve and money supply is not widely studied by the scholars. However, Joof & Tursoy have explored the topic but with a focus on The Gambia. Nevertheless, this study uses a panel of five WAMZ member states.

3.2 Economic Growth Nexus Money Supply

Various scholars both in advance, developing and emerging economic have examined the relationship between money supply and economic growth.

WAMA (2009) employed a basis statistical analysis in 15 ECOWAS nations from 2002-2008 to investigate the association between money supply and other macroeconomic indicators (GDP, exchange rate, inflation rate etc.). The analysis showed that a money supply has a positive influence on GDP base on the depending on the structural circumstances, and that in all the 15 countries; percentage growth on money supply was greater than GDP. Njimanted et al. (2016) used "Vector Auto-regression (VAR) technique to examine the consequence of M2 on economic growth in the "Central African Economic and Monetary Community (CEMAC). CEMAC was set up by a Treaty signed in 1972 by six states which include Cameroon, Chad, Equatorial Guinea, Gabon, The Central Africa and the Republic of Congo". The analysis evidenced that M2 affected the economic growth in diverse areas.

Prasert et al. (2015) employed "Pooled Mean Group Estimator (PMGE)" to explore the relationship amid money supply and economic growth of some selected "ASEAN Economic Cooperation countries (Cambodia, Indonesia, Lae PDR, Malaysia, Philippines, Singapore, Thailand and Vietnam)" from 1995-2013. Their results highlighted that money supply which entails demand deposit and narrow money had positive association with economic growth. Furthermore, Bednarik (2010) used the "Vector Autoregressive (VAR), Johansen Cointegration technique, and Granger-Causality test to investigate the association amid real GDP and M3 from

2002-2009 in the Czech Republic. He highlighted that the results indicated a robust and feedback association between M3 and GDP. Zapodeanu and Cociuba (2010) employed DVAR technique and cointegration analysis to test the association between money supply (M1, M2 and M3) and GDP in Romania from 1999-2010. Their outcome revealed a long term cointegration between the indicators and that the DVAR technique is best fit for explaining the association among the indicators.

Havi and Enu (2014) scrutinized the comparative prominence of "monetary policy and fiscal policy on economic growth" in Ghana for the period 1980 to 2012. They employed the Ordinary Least Squares (OLS) technique which showed that money supply and economic growth has a significant positive association. Chipote and Palesa (2014) utilizes the "Error Correction Model and Johansen Co-integration" to study the influence of monetary policy on economic growth from 2000-2010 in South Africa. The results discovered that money supply has a neutral relationship with economic growth. Using the Error Correction model on a time series spanning from 1980-2006 in the case of Nigeria, Ogunmuyiwa and Ekone (2010) propounded that expansionary and contractionary money supply has an insignificant influence on GDP. Onyeiwu (2012) evaluated the influence of "monetary policy" on GDP in Nigeria spanning from 1981to 2008 by means of OLS. The outcomes showed that money supply and GDP are positively related. Furthermore, Chinuba et al. (2015) in the case of Nigeria uses the OLS from 1981-2008 to estimate the link amid GDP and M2. Their study suggested a positive co-movement between economic growth and money supply.

Overall money supply and economic growth have been extensively studied, nevertheless, they the closest, to our study is WAMA (2009), which employs a basis statistical correlation analysis in 15 ECOWAS nations. We try to fill the gap by using both the dynamic panel and static panel for robustness check.

4.0 Methodology

4.1. Data

In scrutinizing the influence of foreign currency reserves (FCR) and economic growth (GDP) on money supply (M2) in the WAMZ, an annual panel data of five members of West African Monetary Zone is used. The data was sourced from "West African Monetary Institute Database"

covering the period 2001-2019. The choice of the data is based on its availability. The paper uses the framework of Joof and Tursoy (2021) and Khan (1999). Money supply (M2) is the dependent variable, FCR and GDP are the explanatory variable while inflation is the control variable.

$$LM2 = f(LFCR, LGDP \text{ and } INT) \quad (1)$$

Where, LM2 is the log of money supply, LFR is the log of foreign reserves, LGDP is log of economic growth and INT is interest rate.

Table-1. Variables Representation

Indicators	Procedure	Unit	Source
Money Supply (LM2)	M1 (Coins and currency in circulation + traveler's check +demand deposits) + certificates of deposits+ money market funds+ saving deposits + other time deposits	USD	West African Monetary Institute (WAMI, 2019)
Foreign Currency Reserve (LFCR)	Total Foreign Reserve held abroad	USD	West African Monetary Institute (WAMI, 2019)
Economic Growth (LGDP)	GDP per Capita	USD	World Bank (2019)
Interest (INT)	Monetary policy rate	%	West Africa Monetary Institute (WAMI, 2019)

Source: Source: Constructed by author, from the data

Table2 List of WAMZ Selected Countries

The Gambia	Guinea	Sierra Leone
Ghana	Nigeria	

Note: Liberia is excluded from this study due to incomplete data.

4.2 Unit Root and Cointegration Test

Following performance of the Augmented Dickey-Fuller (ADF) proposed by Maddala and Wu (1999) and Breitung (2000) unit root test to substantiate the existence of "stationarity" among the series, the "cointegration method" invented Kao (1999) is applied, which is an extension of the "Eagle Granger Causality" in a panel context as a result of its "first generation cointegration test residuals".

4.3 Fully Modified OLS and Dynamic OLS

In this paper, the dynamic long-run techniques like the "Fully Modified OLS (FMOLS) and Dynamic OLS (DOLS)" invented by Mark and Sul (2003) are utilized to analyze the impact of the independent variables on money supply. Pedroni (2004), argues that the "FMOLS" is more preeminence than the "Engle and Granger (EG) techniques" hence it applies suitable correction to solve the inference problems posed by the "EG method". Furthermore, the "FMOLS and DOLS estimators" corrects "endogeneity problems and autocorrelation". FMOLS is a nonparametric test which deals with the serial correlation (Pedroni 2000); and DOLS is a parametric approach with explicitly estimated lagged first differenced parameters (Saikkonen 1991).

Moreover, the FMOLS and DOLS to be stationary a pre-requisite for all variables and the variables must be co-integrated, this assist in avoiding spurious analysis (Isiksal and Joof, 2021). The model is articulated as follows: the choice of the variables was based on the theoretical framework of Khan (1999) and Joof and Tursoy (2020).

$LM2_t = \beta 0 + \beta 1 LFCR + \beta 2 LGDP + INT + \varepsilon it;$ (2)

Where:

LM2= the log of money supply,

LFCR = the log of foreign currency reserves,

LGDP = log of economic growth

INT= interest rate

ε =the error term, i=1, 2,., N are countries and t=1,2,…T denote the time period.

4.4 Fixed Effect and Random Effect Model

To check for the robustness of the FMOLS, we employed the "Fixed Effect Model (FEM) Random Effects Model (REM) approach". The FEM is a technique with constant rather with different intercepts centred on "cross-sections" (nations or firms). Although intercepts can vary amid countries, entirely these intercepts do not vary from time-to-time Gujarati (2004). The analysis with "ordinary least square (OLS)" makes the estimation into "General Least Square Fixed Effect". Consequently, the resulted data are unbiased and consistent.

In the fixed effect model, the variables are reflected by the intercept, but in the "Random effects model" (REM), the variances are accommodated by the error terms of the estimation. The Hausman investigation aids in choosing the appropriate technique between the FEM and REM. This testing is conducted with following hypotheses: Ho: P-Value is > 0.05, and then REM is appropriate. H1: P Value is < 0.05, and then FEM is FEM is suitable.

4.5 Dumitrescu and Hurlin (DH) Causality

The Dumitrescu and Hurlin (DH) (2012) causality analysis applied to analyze the causal relationship between the reqressors and the dependent variables. Once the cointegrating relationship among the series is established, it denotes a probable causal connection between the variables. "Establishing these causal relationships can assist in validating the empirical findings (isiksal and Joof, 2021)".

"The Granger causality simple regression with M and T variables are represented in Equation (3) and (4):

$$M_t = a_1 + \sum_1^n \beta_{1i} N_{t-i} + \sum_1^n \beta_{2i} M_{t-i} + u_{1t} \quad (3)$$

$$N_t = a_2 + \sum_1^n \beta_{3i} N_{t-i} + \sum_1^n \beta_{4i} M_{t-i} + u_{2t} (4)$$

Where n denotes the number of lags, $a_1, a_2, \beta_1, \beta_2, \beta_3, \beta_4$ parameters that will be estimated, $u_{1t}$and $u_{2t}$are error terms. If M variable does not cause N variable, thus the parameters of N over the lagged M together nill.

Dumitrescu and Hurlin (2012) introduced Granger causality method for panel models by including cross-sectional units, for z and h variables which are stationary over T period and N individuals".

$$z_{i,t}=\upsilon_t + \sum_{c=1}^{C} \mu^{(c)} z_{i,t-c} + \sum_{c=1}^{C} \beta^{(c)} h_{i,t-c} + e_{it} (5)$$

Where, e is the error expression.

5.0 PRESENATION OF DATA

5.1 Description of Statistics

The analysis in table 1 suggested that money supply, economic growth, foreign reserves and inflation have an average annual growth rate of 7.9%, 6.8%, 6.8% and 12.0% respectively in the selected WAMZ countries. The results also indicated that M2, GDP, FCR and INT have a maximum rate of 11.5%, 8.1%, 11.1% and 39.1%, with a minimum rate of 4.9%, 5.7%, 3.1% and 0.4% respectively.

Table 1: Descriptive Statistics

	LM2	LGDP	LFCR	INT
Mean	7.855590	6.757536	6.829961	12.00760
Median	7.438083	6.591928	6.271670	11.42090
Maximum	11.52953	8.077973	11.07446	39.10000
Minimum	4.935470	5.718883	3.141995	0.400000
Std. Dev.	1.960032	0.615082	2.304634	6.169305
Skewness	0.511555	0.471476	0.518998	1.459846
Kurtosis	2.018902	2.233639	2.053598	6.819286
Sum	659.8696	567.6330	573.7167	1008.638

5.2 Unit Root Test

The ADF and Breitung test showed that the series are stationary at I(1), thus the hypothesis that the series contained unit root is discarded at 5% significance level.

Table 2: ADF Fisher Unit Root Test

Level	First difference

Variables	Intercept	Intercept & trend			Intercept	Intercept& trend		
	ADF.	P value.	ADF.	P value.	ADF.	P value.	ADF.	Pvalue
LM2	34.6734	0.9691	26.736	0.9986	172.55	0.0000***	150.147	0.0000***
LFCR	36.2643	0.9522	61.588	0.1704	144.61	0.0000***	118.79	0.0000***
LGDP	64.3307	0.1172	59.284	0.2272	152.30	0.0000***	119.205	0.0000***
INT	57.5706	0.2767	67.289	0.0753	151.93	0.0000***	109.033	0.0000***

Table 3: Stationarity (Breitung t-statistics)

Variables	**Level & intercept**		**First Difference**	
	T-statistics	**P Value**	**T-statistics**	**P Value**
LFCR	0.02315	0.5092	-2.11946	0.0170***
LGDP	0.83129	0.7971	-5.16628	0.0000***
LM2	2.64660	0.9959	-4.71406	0.0000***
INT	-0.36692	0.3568	-1.72604	0.0422**

5.3 Kao Cointegration

The Kao cointegration revealed the presence of long run cointegation between the series, hence the p value is <0.05% significance, thereby rejecting the null inertia of no cointegration.

Table 4: Kao Residual Cointegration Test

Variable	**T-statistics**	**P Value*** **	**Cointegration**
LM2 = f (LFCR, LGDP, INT)	-1.981581	0.0228 **	Yes

Note: "LM2= money supply, LFCR= foreign currency reserve and LGDP= gross domestic product. The bracket symbolizes the P value while, ***' **' * represent 1%, 5% and 10% significance level respectively".

5.4 Hausman Test

The hausman test in table 5 suggested that the Fixed Effect Model is preferable to the Radom Effect Model (REM) because the null hypothesis that the REM is better is discarded at 1%

significance level. Hence the Hausman test have showed the superiority of the fixed effect over the random effect model, we deem it not necessary to tabulate the random effect.

Table 5: Hausman Test

Variable	Fixed	Random	Var(Diff)	P value
LFCR	0.067324	0.074553	0.000307	0.6800
LGDP	0.120076	0.001002	0.000839	0.0000***
INT	-0.059567	-0.010355	0.000161	0.0001***
Summary				0.0000***

5.5 FMOLS DOLS and FE

5.5.1 Findings

Table 6 revealed the outcome of the FMOLS, DOLS and FE. The findings show that foreign currency reserves have a positive impact on money supply, implying that a one percent increase in FCR is associated with a rise in M2 by 0.13%, 0.31% and 0.07% respectively. This result is in conformity with the finding of Joof & Tursoy (2020) who found a positive relationship between FCR and M2 in the case of The Gambia. Similarly, economic growth is associated with an increase in money supply in both three models. This suggests that a percentage increment in GDP will augment M2 by 0.76%, 0.81% and 0.12% respectively. Economic growth which is triggered by lower interest rate usually causes total expenditures, interest-sensitive consumption goods and investment growth, tend to increase M2 duo to increase in economic productivity. However, inflation has a negative insignificant relationship with money supply. The diagnostics (S.E of the regression and Long run variance and Durbin Watson) in the FMOLS, DOLS and FE indicated that the models are properly specify and stable, and not suffering from heteroskedasticity and serial correlation. Furthermore, the R^2 in the three models which measures goodness-of-fit for linear regression models stood at 0.99%, this suggest that the 99% of the variance in M2 is explained by LFCR, LGDP and INT (explanatory variables) collectively. This showed that there is a strong association among the series.

Table 6: The FMOLS, DOLS and FE Technique

Variables	FMOLS	DOLS	FE
LM2 (-1)	-	-	0.790456
LFCR	0.134859	0.306247	0.067324
	(0.0088) ***	(0.0021) ***	(0.0098) ***
LGDP	0.762762	0.814866	0.120076
	(0.0000) ***	(0.0000) ***	(0.0264) **
INT	-0.023003	-0.085870	-0.059567**
	(0.5765)	(0.4104)	(0.0351)
C	**-**	**-**	**0.614209**
Durbin Watson			**2.101177**
R^2	**0.994406**	**0.999736**	**0.997053**
Adj. R^2	**0.993389**	**0.998723**	**0.996726**
S.E	**0.1590103**	**0.072750**	
Long run	**0.021218**	**0.000389**	

Note: "LFCR= foreign currency reserve and LGDP= gross domestic product. The bracket symbolizes the P value while, ***' **' * represent 1%, 5% and 10% significance level respectively. DOLS means Panel Dynamic Least Squares, Panel Fully Modified Least Squares (FMOLS) and Fixed Effect (FE)".

5.6 Dumitrescu Hurlin Panel Causality Test

The analysis revealed that there is a two-way causation among foreign currency reserve and M2. This means that foreign reserves and money supply are complementary. This confirms the study of Joof &Tursoy (2020) of a feedback relationship in the case of Gambia. Conversely, a unidirectional causality moving from economic growth to M2 is observed, demonstrating that economic growth causes M2. This outcome is explained by the QTM (quantity theory of money) in which the velocity of money is a positive function of total money supply. As money circulates in the economy as a result of a surge in investments, consequently increases money stock.

Similarly, “investment opportunities and potentials that are been exploited day-by-day stands as a ground for increasing money stock” (Gatawa et al., 2017). A neutral causal association amid interest rate and money supply is observed.

Table 7: Pairwise Dumitrescu Hurlin Panel Causality test

Variables	W-Statistic	Zbar_Statistic	P value
LFCR ↔ LM2	4.64381	3.89365	0.0001 ***
LGDP → LM2	2.57191	1.67033	0.0949*
INF≠LM2	2.27911	1.31183	0.1896

6.0 CONCLUSION

This paper analysis the influence of foreign currency reserve and economic growth on money supply, using a panel data of five WAMZs member states from 2001-2019. The study employed the dynamic technique (FMOLS and DOLS) and the Static method (FE) for robustness check. The results showed that foreign currency reserve has a positive impact on M2 implying that a one percent increase in FCR is associated with a rise in M2 by 0.13%, 0.31% and 0.07% respectively. This result is in conformity with the finding of Joof &Tursoy (2020) who found a positive relationship between FCR and M2 in the case of The Gambia. Similarly, economic growth causes an increase in money supply in both three models. This suggest that a percentage increment in GDP will augment M2 by 0.76%, 0.81% and 0.12% respectively. Furthermore, the “DH Causality” estimation revealed a two-way causation among foreign currency reserve and M2. This means that that foreign reserves and money supply are complementary. However, a unidirectional causation moving from economic growth to money supply is found, while a neutral causal association amid inflation and M2 is found. It is not surprising that foreign currency reserve increases money supply in The Gambia because in the endeavor to boost foreign reserves, monetary authorities substitute domestic currency with foreign currency through intervention policies (purchasing foreign currency via the domestic market) this increases the reserve money. It also support the findings of WAMI (2018) that net foreign assets is the main driver for growth in money supply within the region.

6.1 Recommendations

Based on the above-mentioned findings, we recommended the following:

(i) Central banks should endeavor to monitor the expansionary influence of net foreign assets (NFA) on money supply growth in the WAMZ by establishing suitable methods to sterilize foreign exchange infusions into the economy.

ii) Growth in monetary base should be closely tied to the objective of stimulating growth. thus, this prevents the economy from over-heating and inflation.

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