

MONETARY POLICY EFFECT ON BALANCE OF PAYMENT IN WEST AFRICA

Oluwafemi Isaac AJAYI,

Monetary Policy Department, Central Bank of Nigeria

Zenith4real13@hotmail.com

Samuel OCHINYABO,

Nigerian Institute of Social and Economic Research, Ibadan-Nigeria

ochinyabos@gmail.com

&

Omotayo ADEBAGBO,

Glasgow, Caledonian University, Glasgow, Scotland, United Kingdom

Fintech Enthusiast & Payment Analyst, tboius@yahoo.com

Abstract

The study examined monetary policy regimes and the balance of payment in West Africa. The study's objective was to examine the effect of monetary policy regimes on the balance of payment in West Africa. The study adopted an ex-post facto research design and obtained secondary data from documents of the Central Banks of the WAMZ countries, the World Bank Development Indicator (WDI), and the International Monetary Fund (IMF) database from 2001 to 2021. The estimation technique employed was the Panel Autoregressive Distribution Lag model, complemented by the Juodis, Karavias, and Sarafidis (2021) granger-causality test. According to the findings, the various monetary policy regimes in West Africa had conflicting effects on the balance of payments. It demonstrates how that goal can be achieved in the short term using the money supply and monetary policy rate. However, over time, policy rate had a positive effect on the balance of payments, as the money supply was insignificant. These results are particularly importantcrucial given the goal of unifying the monetary policy regime in the ECOWAS in 2027. Based on the findings, the paper concluded and recommends that to achieve a balance of payment equilibrium in West Africa, the monetary policy rate is an effective tool, this is because it is significant in explaining the changes in the balance of payment in the countries in West Africa. Thus, monetary authorities should ensure a correct balance of the rate when to increase or decrease the policy rate with the hindsight of implications on the current account.

Keywords: *Monetary Policy, Price Stability, Balance Of Payment, Consumer Price Index, Monetary Policy Rate, Money Supply.*

DOI: 10.58934/jgeb.v5i18.276

1. INTRODUCTION

West African countries experienced economic growth of an average of 7% between the periods from 2006 to 2014 from receipts from their primary commodities sales. There was great enthusiasm about prospects for improved economic development, and the governments propagated a whole range of new policies in anticipation of this. But then, the oil and commodities price crash occurred in 2014 which saw the countries lose considerable revenue, such that exchange rates deteriorated resulting in a continuous balance of payment deficit (IMF, 2023). While traditional theories maintain that balance of payment disequilibrium is permanent, the major point of departure of new approaches is the recognition of the fact that a country in the balance of payment deficit or surplus would *ceteris paribus*, experience a change in its money stock (Khan (2023). Folarin & Asongu (2019) argued that since ensuring balance of payment is one of the mandates of most central banks across the globe, monetary targeting policy regimes in an economy with stable money demand will reduce macroeconomic fluctuations, and also promote price stability. Odinaka, Nkwagu, Nkwagu, and Chinedu,(2021)'s studies cast doubt on the appropriate monetary tools that will be effective in ensuring this in most developing economies. This may be the reason for the implementation of different monetary policy regimes for macroeconomic stability in West Africa.

The appropriate monetary policy regimes in developing economies have attracted research interest in literature (Ujunwa et al., 2022; Abille and Meçik, 2022). This is traced to the importance or effectiveness of a monetary policy regime in promoting macroeconomic stability. The current monetary policy regimes in West Africa are inflation targeting in Ghana, monetary targeting in Nigeria, Sierra Leone, Guinea, and the Gambia, and exchange rate targeting in Liberia (Tule et al. , 2019). Globally, Central Banks use money-related variables; monetary policy rate, broad money supply, real exchange rate, interest rate, and credit to the private sector to address economic activities through its operations on behalf of the government (Adabor & Buabeng, 2020). and (Aderemi, Soyemi, Alaka & Efunbajo, 2020). The various monetary policy regimes in West Africa do not seem to have fared well in the respective countries. This is especially so when it can be observed that all the countries do not have the required balance of payment equilibrium for sustainable economic development.

The reality of these has drawn attention to whether monetary policies among other policy issues in the region are responsible for the unfavourable balance of payment. Despite the similarities in economic structure in West Africa, the countries adopted different monetary policy regimes, and even within the same country, different monetary policy regimes were implemented to no avail. So, it becomes necessary in the midst of these to ascertain the appropriate monetary policy regime that is suitable for achieving a balance of payment equilibrium for macroeconomic stability in West Africa. The paper selects six countries in West Africa that are also member states of the West African Monetary Zone, and asks the question, what is the effect of monetary policy regimes on the balance of payment in West Africa? Hence, the broad objective of this paper is to examine the effect of the different monetary policy regimes on the balance of payment in selected countries in West Africa.

The paper was organized into five sections. Section one covers the introduction. Section two captures the review of related literature, it includes the conceptual clarifications, theoretical literature, and empirical review. Section three focuses on the research methodology. Section four is on the presentation of data, data analysis, and discussion of results. Finally, Section Five presents the summary of findings and concluding remarks.

2. LITERATURE REVIEW

2.1 Conceptual Review: Monetary Policy, Balance of Payment

Monetary policy is the aspect of government policy undertaken by the monetary authority to control money in the economy According to Ufoeze, Odingbe, Ezeabalisi, and Alajekwu (2018), monetary policy is the deliberate utilization of monetary instruments to achieve economic stability, is at the disposal of the monetary authority, such as Central Bank of Nigeria. Adediran, Matthew, Olopade, and Adegboye (2017) explained that monetary policy entails the tools used by the monetary authority to achieve price stability, promote output growth and employment, maintain the balance of payment equilibrium, and sustainable development. Sri and Imronjana (2016) referred to monetary policy as the instrument of the central bank for achieving macroeconomic objectives such as output growth, price stability, and unemployment rate. To Bashir and Sam-Siso (2020), monetary policy involves macroeconomic instruments of monetary authority for macroeconomic stability, acceleration of economic recovery, and sustainable growth.

This paper defined monetary policy as the various money control regimes utilizing the tools of interest rate and money supply by the members of the West Africa to achieve macroeconomic objectives of price stability, favourable balance of payment, and output growth in the economy. As earlier stated, the member countries of West Africa practice different monetary policy regimes with the Gambia, Guinea, Nigeria, and Sierra Leone engaging in monetary targeting, while Liberia is engaged in exchange rate targeting and it is inflation targeting in Ghana.

2.2 Theoretical Review: The Monetary Approach

Theories of a balance of payments are concerned with identifying possible determinants of the balance of payment and specifically the analysis of policies for achieving a balance of payment equilibrium. The Keynesian revolution introduced the notion of disequilibrium into the analysis of the international monetary system. While conventional theories view the balance of payment as a real phenomenon determined by real forces like income, expenditure, and relative prices, the modern monetary theory formulates the balance of payment as a monetary phenomenon establishing a link between the state of the domestic money market and level of international reserves (Amassoma, Ogbuagu and Olaosebikan, 2020). The monetary approach to the balance of payments was first outlined by Han (1959) and further developed by Mundell (1968). It views the balance of payment as essentially a monetary phenomenon. Payments imbalances are rooted in the relationship between the demand for and the supply of money. The monetary approach rests on the basic premise that over the long run there exists a stable demand function for money as a stock. The quantity of nominal money balances demanded is a positive function of nominal income. The demand for nominal money balance is a stable positive function of the level and real income. Money supply (*MS*), for which demand is a stable function is a constant multiple (*m*) of the monetary base. In turn, that base has two components; domestic credit created by the monetary authorities (*D*), and an international component (*R*). The latter component can be increased or decreased by any inflow or outflow, irrespective of money from foreign countries when the balance of payments as defined previously is in a surplus or a deficit, respectively.

Demand for money can be satisfied either from domestic or international sources. Thus, if the demand for money rises- say, because of an increase in real income while domestic supply remains unchanged, the excess demand would be satisfied by an increase in the international component. That is, by drawing foreign-source funds into the country. And that generates a

balance of payment surplus. Conversely, a rise in domestic supply (D), with demand for money M_d remaining unchanged, would produce a deficit. In general, any change in the domestic component of the money supply is ultimately offset by an equal and opposite change in the international reserve component through the balance of payments. A surplus or deficit in the balance of payments reflects stock disequilibrium between demand for and supply of money. A surplus based on “official reserve transactions” occurs when demand for monetary balances exceeds the money stock. If the excess demand for money is not satisfied from domestic sources, such as by an increase in domestic money supply, funds will be attracted from abroad to satisfy it. Such an inflow can be generated through a surplus on commodity trade or the service account, direct investments by foreign companies, or an attraction of private long-term or short-term portfolio funds. The precise composition is immaterial; the important thing is that the excess demand for money stock will generate a balance of payments surplus. But assuming no intervention by the monetary authorities to “offset” or “neutralize” the resulting inflow of funds such a surplus is necessarily temporary and self-correcting. It will continue only until the money stock rises to the level necessary to satisfy the demand for money balances- that is until the excess demand for money is eliminated.

2.3 Empirical Review

Between 1980 and 2019, the impact of monetary policy instruments on Nigeria's balance of payments was studied by Odinaka, Nkwagu, Nkwagu, and Chinedu (2021). Findings show that the cash reserve requirement, exchange rate, and money supply are statistically significant and as a result, have an impact on Nigeria's balance of payments. The outcomes also demonstrate that, despite being consistent with theoretical predictions, the inflation rate and interest rate are statistically insignificant. This suggests that not all monetary policy tools have an effect on the balance of payments both in the long run and the short run. Gnahe, Huang, and others (2020) looked at the connection between monetary policy and economic growth. The eight members of the West African Economic and Monetary Union (WAEMU) were studied using a panel cointegration structure over the years 1988–2018. The estimation analysis's findings demonstrated that the money supply and gross fixed capital formation had a favorable and significant impact on economic growth. The results also demonstrate that the real interest rate had a significant impact on economic expansion. The official exchange rate and domestic credit to the private sector both showed a positive and statistically significant impact on economic growth. Oluwole and Oloyede (2020) tested the monetary approach to Balance of

Payment in developing countries of West Africa. The empirical results of the fixed effect model established a significant positive relationship between net domestic credit, interest rate, and exports; and an insignificant positive relationship between capital movements, imports, income, and the dependent variable. The exchange rate, however, had a significant negative relationship with the net foreign assets, while inflation had an insignificant but negative relationship with net foreign assets.

The pairwise causality tests revealed that the exchange rate, net domestic credit, and net foreign assets have a one-way relationship while the other variables move independently and cannot be said to cause net foreign assets. Khan (2023) tries to re-examine the effects of domestic credit provided by the financial sector, real interest rate, real GDP growth, inflation rate, and exchange rate on the balance of payments by net foreign assets (NFA) in 17 developing countries over the period of 1982–2019. The Granger causality test results show a two-way causal relationship between domestic credit and NFA as well as between exchange rate and NFA. Additionally, when looking at individual countries, the overall empirical estimates from three estimators are acceptable for 17 different countries, despite some differences between the countries in the size of the estimated coefficients of variables and level of significance. According to empirical research, in order to stabilize a country's Bop account, central banks (monetary authorities) must take into account other policy options on par with monetary instruments in order to correct the disequilibrium in the BoP. Based on panel data for 33 of these countries from 1990 to 2020, Abille and Meçik (2022) looked into the factors that affect the balance of payments performance of African countries as a whole. The findings demonstrate that the key determinants of BOP performance in Africa are domestic income, trade openness, and the broad money supply. Furthermore, an inverted U-shape phenomenon rather than a J-curve phenomenon is seen for Africa relative to the exchange rate, contradicting the domestic income growth-BOP performance trade-off hypothesis. Amassoma, Ogbuagu, and Olaosebikan (2020) investigated the effect of the monetary approach on the balance of payments adjustment as a result of the persistent imbalances in the country's balance of payments and to find out its inherent causes using the autoregressive distributed lag approach. Evidence from the ARDL bound test approach revealed that the monetary approach (broad money supply and exchange rate) impacts on balance of payment, hence supports the monetary approach to BOP adjustment. Also, the results showed that trade balances affect BOP adjustment but are ineffective in correcting the longed-experienced BOP deficits due to the country's over-reliance on imported goods and oil revenue.

Ufoeze, Odimgbe, Ezeabalisi, and Alajekwu (2018) investigated the effect of monetary policy on economic growth in Nigeria. The findings revealed that money supply, monetary policy rate, investment, and interest rate had a positive effect on the gross domestic product, but only the effect of the money supply was significant. Bertasiute, Massaro, and Weber (2020) studied economic integration and monetary policy based on the New Keynesian currency union model. The paper engaged data from eight selected countries and analyzed data with descriptive analysis. The result showed that economic integration is essential to promote stability in economic dynamics. Olamide, Mareka, and Ogujiuba (2022) investigated the relationship between monetary policy, external shocks, and economic growth in East Africa. The result also revealed that consumer price influences gross domestic product through exchange rate and money supply. Ocheuje (2021), in *Understanding Balance of Payments and its Link with Monetary Policy in Nigeria*. This paper explores some of the major developments and trends in Nigeria's BOP as well as their interrelationship with other macroeconomic accounts

Atoi (2020) used the monetary approach to balance of payment to establish a link between foreign reserve assets and money supply with data from 2007:Q1 to 2018:Q4. The estimated balance of payment model reveals that domestic credit is statistically significant and negatively related to foreign reserve assets, implying that balance of payment is a monetary phenomenon in Nigeria. The velocity of money circulation and the marginal propensity to import are approximately 120 percent and 14 percent, respectively. In their paper published in 2019, Osisanwo, Tella, and Adesoye investigated how Nigeria's monetary policy affected the BOP adjustment over the years 1980 to 2015. Further research found that trade balance and money supply have a favorable long-term effect on Nigeria's adjustment to the balance of payments. However, indicators such as the domestic credit market, foreign exchange rate, inflation rate, and gross domestic product point to a detrimental effect on Nigeria's balance of payments. The money supply has a longer-term impact on BOP adjustment than other monetary policy variables, which is a significant finding from the empirical estimate.

2.4 Gap in Literature

It was observed that studies have been conducted on monetary policy and economic performance in ECOWAS countries (Aderemi et al., 2019; Olayungbo, 2019; Ufoeze, et al., 2018; Adabor & Buabeng, 2020; Bashir & Sam-Siso, 2020); Olakanmi & Olagunju, 2020; Olamide, et al, 2022; Harvey & Cushing, 2015; Balogun, 2007; Onye & Umoh, 2021;

Twinoburyo & Odhiambo, 2017). However, most of these studies were conducted in Nigeria (such as Olayungbo, 2019; Nwoko et al., 2016; Ufoeze, et al., 2018) with few from countries like Ghana (Adabor & Buabeng, 2020), indicating that the majority of the studies in West Africa had conducted the country-specific analysis. Furthermore, this will give an expose on the direction of the impact of various monetary policy regimes in West Africa to do a comparative analysis of these and know which have favourable outcomes that will determine their position in the forthcoming unification of the ECOWAS monetary policy regime in 2027.

3. METHODOLOGY

3.1 Research Design

This paper made use of longitudinal research design which captures observations from both time series and cross-section data units. Specifically, the time series observation in this paper was the annual period related to the scope of the paper, while the cross-sectional unit comprised data from the selected West African countries that are also member-states of the West Africa Monetary Zone. Hence this paper is a panel-based paper in which dataset from secondary sources of the documents of the various Central Banks of the selected countries, the World Bank, and the International Monetary Fund (IMF) over a period from 2001 to 2021 was analyzed. Macroeconomic variables that are important for macroeconomic stability and are policy targets for the various governments to achieve sustainable growth are the focus of this paper. This includes the real gross domestic product to measure output growth, inflation rate to measure price stability, and current account to measure the balance of payment.

3.2 Method of Data Analysis

To achieve the objective, the paper made use of both descriptive and inferential statistics analysis. The Descriptive analysis conducted in the paper includes mean analysis, standard deviation analysis, minimum and maximum analysis, and trend analysis, followed by cross dependence test, panel unit root test, and co-integration test. Panel Autoregressive Distributed Lag (ARDL) using a Pooled Mean Group (PMG) and Mean Group (MG) regression was used to track the long-run and short-run effect of monetary policy regime on the balance of payment equilibrium in West Africa as determined by the Hausman test. The Xiao, Juodis, Karavias, and Sarafidis (2021) granger-causality was conducted as a robustness check

3.3.1 Model Specification

From empirical literature, this paper adopted the model of Ufoeze, Odimgbe, Ezeabalisi, and Alajekwu (2018), which specified that macroeconomic performance is measured in terms of gross domestic product as a function of monetary policy variables such as monetary policy rate, broad money supply, and interest rate – that are the target variables of monetary policies in the various countries. However, this paper modified equation (4) by using the real gross domestic product growth rate (gdpgr), the growth rate of domestic credit to the private sector (dcr), the real effective exchange rate (rexr) inflation rate (inf), and current account balance (a proxy for the balance of payment) as macroeconomic performance variables.

The paper focuses on identifying the long and short run effect of monetary policy on the balance of payment equilibrium as well as investigating the possibility of heterogeneous dynamic issues across the selected countries, the appropriate technique to be used for the analysis of dynamic panels is autoregressive distributed lag ARDL (p, q) model in the error correction form. So, the model was estimated based on the mean group (MG) presented by Pesaran and Smith (1995) and pooled mean group (PMG) estimators developed by Pesaran et al. (1999). To measure a heterogeneous short-run impact and a homogenous long-run impact of the respective variables on the dependent variable, Pesaran et al. (1999) adopt the maximum likelihood estimation (MLE) approach by assuming that the disturbances ε_{it} are normally distributed. The PMG model proposed by Pesaran et al. (1999) is estimated in the following format:

$$lnbop_{it} = \mu_i + \sum_{j=1}^p \lambda_{ij} lnbop_{it-j} + \sum_{j=0}^q \delta'_{ij} X_{it-j} + \varepsilon_{it}$$

.....eqn. 1

where $i = 1, 2, \dots, N$ represents cross-sectional unit $t = 1, 2, 3, \dots, T$ represents time (annual), and j is the number of time lag. X'_{it} is the vector of independent variables, e.g., and finally μ_i is the fixed effect? By re-parameterization, the above equation can be written as:

$$\Delta lnbop_{it} = \mu_i + \varphi_i lnbop_{it-1} + \beta'_i X_{it} + \sum_{j=1}^{p-1} \lambda_{ij} lnbop_{it-j} + \sum_{j=0}^{q-1} \delta'^*_{ij} X_{it-j} + \varepsilon_{it} \cdot$$

eqn. 2 Where

$$\varphi_i = -1 \left(1 - \sum_{j=1}^p \lambda_{ij} \right), \beta_i = \sum_{j=0}^p \delta_{ij} \dots \dots \dots \text{eqn.3}$$

$$\lambda_{ij^*} = - \sum_{m=j+1}^p \lambda_{im}, j = 1, 2, \dots, p - 1, \text{ and} \dots \dots \dots \text{eqn.4}$$

$$\delta_{ij^*} = - \sum_{m=j+1}^p \delta_{im}, j = 1, 2, \dots, q - 1 \dots \dots \dots \text{eqn.5}$$

Now by grouping the variables in levels further, equation (2) is rewritten as an error correction equation:

$$\Delta \ln bop_{it} = \mu_i + \varphi_i (\ln bop_{it-1} + \theta'_i X_{it}) + \sum_{j=1}^{p-1} \lambda_{ij} \ln bop_{it-j} + \sum_{j=0}^{q-1} \delta'_{ij} X_{it-j} + \varepsilon_{it} \dots \dots \dots \text{eqn.6}$$

Where $\theta_i = -\left(\frac{\beta_i}{\varphi_i}\right)$ defines the long-run or equilibrium relationship among $\ln bop_{it}$ and X_{it} . In contrast λ_{ij^*} and δ_{ij^*} are short-run coefficients relating growth to its past values and other determinants like X_{it} . Finally, the error-correction coefficient φ_i measures the speed of adjustment of $\ln bop_{it}$ toward its long-run equilibrium following a change in X_{it} . The condition $\varphi_i < 0$ ensures that a long-run relationship exists. Therefore, a significant and negative value of φ_j is treated as an evidence of cointegration between $\ln bop_{2it}$ and X_{it} . Thus, finally, the estimates are measured by:

$$\hat{\theta}_{PMG} = \frac{\sum_{i=1}^N \hat{\theta}_i}{N}, \hat{\beta}_{PMG} = \frac{\sum_{i=1}^N \hat{\beta}_i}{N}; \hat{\lambda}_{jPMG} = \frac{\sum_{i=1}^N \hat{\lambda}_i}{N}, \text{ and } \hat{\gamma}_{jPMG} = \frac{\sum_{i=1}^N \hat{\gamma}_i}{N} \dots \dots \dots \text{eqn.7}$$

Where $j = 0, \dots, q - 1, \hat{\theta}_{PMG} = \hat{\theta}$

Therefore, based on the above methodology presented in equation (3), the following model is developed. Thus, the model to be estimated is:

$$\Delta \ln bop_{i,t} = -\mu_i + \varphi_i (\ln bop_{i,t-1} - \lambda_2 mpr_{i,t-1} - \lambda_3 m2_{t-1} - \lambda_4 dcr_{i,t-1} - \lambda_5 rexr_{i,t-1}) + \sum_{j=1}^{p-1} \lambda_j^i \Delta (\ln gdpgr_i)_{t-j} + \sum_{j=0}^{q-1} \delta_{2j}^i \Delta mpr_{i,t-j} + \sum_{j=0}^{q-1} \delta_{3j}^i \Delta m2_{i,t-j} +$$

$$\sum_{j=0}^{q-1} \delta_{4j} \Delta dcr_{i,t-j} + \sum_{j=0}^{q-1} \delta_{5j} \Delta rexr_{i,t-j} + \delta_{i,t}.$$

.....eqn.8

In the equation, λ_1 represents parameters to be estimated and Δ indicates a differenced operator. If the respective variables are integrated order I (1), then the error term is integrated order I (0) process for all i . A principal feature of cointegration is that any short-run disequilibrium converges towards the long-run equilibrium at a rate of ϕ_1 . Therefore, the parameter ϕ_1 is the error-correcting speed of the adjustment term. If $\phi_1 = 0$, then there would be no evidence of a long-run relationship. This parameter is expected to be significantly negative under the prior assumption that the variables show a return to long-run equilibrium.

Several significant findings will determine whether the PMG approach is valid or not (Samargandi et al. , 2013). In order to guarantee that there is a long-term relationship between the variables of interest, the error-correction term must first be negative and not lower than -2. The second requirement is for the residual produced by the PMG estimator to be serially uncorrelated, after which the explanatory variables must be considered exogenous determinants. The dependent (p) and independent (q) variables of an ARDL model can both include lags in error-corrected form to satisfy these requirements. Finally, this estimator is especially helpful when there are grounds for anticipating that the long-run equilibrium relationships between variables will be comparable across countries because they might share a common characteristic of economic growth.

Using a separate regression estimate for each cross-section, the second method (MG) is used. By averaging each parameter from each regression that is country-specific, this method provides both long-run and short-run parameters. As a result, both in the short run and the long run, the MG method allows for heterogeneous coefficients. Large time series dimensions in the data are a key factor in the validity of MG estimators. The DFE method is then applied based on a few assumptions, including the country-specific intercept and the requirement that the short-run and long-run coefficients of adjustment be identical for all cross sections. The Hausman test is then used to compare each estimator's accuracy and consistency to others.

Where:

- bop = Capital account balance (a proxy for balance of payment)
- gdpggr = Gross Domestic Product Growth Rate,

dcr	=	Domestic Credit to the private sector growth rate
cpi	=	Consumer price index
Rexr	=	Real effective exchange rate
m2	=	Broad Money Supply growth rate
mpr	=	Monetary Policy Rate

Note: In the case of Guinea, Liberia's Official exchange rate (LCU per US\$, period average) was used against the absence of a real effective exchange rate. Also, there was no data for monetary policy rates across the selected countries, thus, the paper resorted to the use of real interest rates.

3.3.2 Cross-Sectional Dependency and Unit Root Tests

In examining the long-run relationship between variables it is imperative to first determine whether or not there is any cross-sectional dependence to avoid producing unreliable outcomes. This thesis investigated this using Pesaran's (2004) cross-sectional dependence (CD) test. The equation is stated below.

$$CD = \sqrt{\left(\frac{2T}{N(N-1)}\right) \sum_{i=1}^{n-1} \sum_{j=i+1}^N (p_{ij}) N(\mathbf{0}, \mathbf{1})}$$

Where N and T are the cross-section dimension and time period respectively p_{ij} also represents the sample estimate of the pairwise correlation of the errors.

To check for the unit root, second-generation unit root test techniques (CIPS and CADF) developed by Pesaran (2007) consider the cross-sectional dependence in the data thus making it better and superior to the first-generation unit root test as far as cross-sectional dependency is concerned. This is conducted in conjunction with the cointegration. Again, with the use of Pooled Mean Group (PMG), the paper can control for endogeneity and serial autocorrelation as well. This method apart from accounting for heterogeneity in data series, it can provide more reliable and robust results. Equations for the two CIPS and CADF are shown below:

$$\Delta Y_{it} = \alpha_1 + p_i Y_{it-1} + \beta_i y_{it-1} + \sum_{j=0}^k Y_{ij} \Delta y_{it-1} + \sum_{j=0}^k \delta_{ij} Y_{it-1} + \varepsilon_{it}$$

$$CIPS = \left(\frac{1}{N}\right) \sum_{i=1}^N t_i(N, T)$$

Where α_i is a deterministic term k is the lag order, y_t is the cross-sectional mean of time t .

3.3.3 Panel Cointegration Test

The Westerlund and Edgerton (2007) cointegration test was performed to establish if the set composed of variables was co-integrated in the long term. This test is made up of four cointegration statistics, which divides them into two groups, the first pair being the statistics of group Gt and Ga , where the null hypothesis is that there is no panel cointegration and as an alternative that there is cointegration for the whole group. On the other hand, the second pair are the panel statistics Pt and Pa , which indicate as an alternative hypothesis that there is cointegration in at least one cross-sectional unit against the null hypothesis that there is no cointegration. In addition, the *bootstrap* approach is applied, which allows to obtain more robust critical values. This is shown below:

$$y_{i,t} = \delta_i d_t + \alpha_i (y_{i,t-1} - \beta_i X_{i,t-1}) + \sum_{j=1}^{p_i} \alpha_{ij} y_{i,t-j} + \sum_{j=-q_i}^{p_i} y_{ij} X_{i,t-j} + \varepsilon_{i,t}$$

where $t=1, \dots, T$ and $i=1, \dots, N$, d_t denotes the deterministic components, while p_i and q_i are the lag and lead orders, which may vary in each country.

3.3.4 Panel Causality Test

To examine the links that exist among the variables, the paper conducted a causality test using the Xiao, Juodis, Karavias, and Sarafidis (2021) Granger Causality test. The choice of this method against other methods is that it produces consistent results in the case of both small samples and cross-sectional dependence (Shahbaz et al., 2018). It is also very suitable

for unbalanced panels and panels with different lag orders for each individual. The empirical equation for this causality test is shown as follows.

$$Y_{it} = \sum_{j=1}^d \alpha_i(d) Y_{it-d} + \sum_{j=1}^d \beta_i(d) X_{it-d} + \varepsilon_{it}$$

where both Y and X refer to gdpgr, dcr, cpi, rexr, m2, mpr, and emp, and d represents lagging lengths, $\alpha_i(d)$ is autoregressive coefficients, and $\beta_i(d)$ is the coefficient that allows for differences across the section.

3.3.5 Multicollinearity Test

The Classical Least Squares Regression Model assumes that there is no multicollinearity among the explanatory variables included in the regression model. The test is carried out using the Pairwise correlation matrix:

$$r = \frac{n \sum x_1 y_1 - \sum y_1}{\sqrt{[(n \sum x_1^2 - (\sum x_1)^2)][(n \sum y_1^2 - (\sum y_1)^2)]}}$$

Where n = no of years, x = explanatory variables 1 to 6, y = dependent variable (TRT), \sum = sum. It has been suggested that if the pair-wise correlation coefficient between two regressions is over 0.8, then multicollinearity is present and may pose a serious estimation problem (Hill, Griffiths and Lim, 2009)

3.3.6 Applicable Diagnostic/ Tests

All variables used needed to meet requisite econometric criteria; for this reason, the following conventional tests were conducted: the cross-sectional dependency and Unit root tests, the Westerlund and Edgerton (2007) cointegration test and causality test, Xiao, Juodis, Karavias, and Sarafidis (2021) causality test and multicollinearity test.

3.4 Justification of Methodology

The paper used the linear Panel ARDL within the framework of dynamic heterogeneous panel methods. The panel ARDL approach applies to cases in which the number of periods is relatively greater than the number of cross-sectional observations ($T > N$). Thus since the number of time series for this research is relatively larger than the number of cross sections ($T > N$), that is, for large T, Pesaran and Smith (1995) show that the traditional panel techniques

[fixed estimator (FE), instrumental variables (IV), GMM estimators] can produce inconsistent and potentially misleading estimates of the average values of the parameters in a dynamic panel data model unless the slope coefficients are identical, hence, the need for analyzing the long-run effects and the speed of adjustment to the long-run.

4. DATA ANALYSIS AND DISCUSSION

4.1 Preliminary Analysis

4.1.1 Cross-Section Dependence Test

This test is conducted to ensure that the estimates obtained are efficient. That is the estimation regression can be relied upon and the test statistics are valid. The balance panel was chosen for the test because the number of time series (T) is greater than the number of cross sections (N). Also, the Pesaran CD estimates is most relevant to this paper because the number of time series is small. The results of the CD tests for the three models are presented below in Table 1.

Table 1: Residual Cross-Section Dependence Test

Test	Statistic	d.f.	Prob.
Breusch-Pagan LM	29.09032	15	0.2157
Pesaran scaled LM	0.572530		0.4101
Pesaran CD	0.517039		0.6293

Source: extract from E-view, 10

Tables 1 present the results of CD tests using Breusch-Pagan LM, Pesaran scaled LM, and Pesaran CD. Evidence from the results is that the null hypothesis of no cross-sectional independence was not rejected. This is indicated by the insignificant probability values in the Pesaran CD values that is above the 5% level of significance. This implies the non-existence of CD in the models, so the estimates are free of residuals that may be caused by the interdependency of economic activities in West Africa.

Table 2: Stationarity Test Results for the Panel Data

Variable s	Levin-Lin-Chu unit- root test		Decisi on	Im-Pesaran-Shin unit-root test		Decisi on	Hadri LM		Decisi on
	Adjusted t- statistics	Prob. Value		w-t-bar statistics	Prob.		z statistics	Prob.	
gdpgr	-4.05	0.0000* **	I (0)	-3.8174	0.0001* **	I (0)	-2.3075	0.9895***	I (0)
D(gdpgr)	-	-	-	-	-	-	-	-	-
cpi	0.1213	0.5483		2.4142	0.9921		29.3892	0.0000	-
D(cpi)	-8.9897	0.0000* **	I (1)	-8.5061	0.0000* **	I (1)	0.2689	0.3940***	I (1)
bop	-2.0591	0.0197* *	I (0)	-1.3183	0.0937*	-	31.1931	0.0000	-
D(bop)	-	-	-	-6.0820	0.0000* **	I (1)	-1.8879	0.9705***	I (1)
mpr	-6.9293	0.0000* **	I (0)	-5.4241	0.0000* **	I (0)	4.2806	0.0000	-
D(mpr)	-	-	-	-	-	-	-1.7247	0.9577***	I (1)
m2	-2.2285	0.0129* *	I (0)	-2.3364	0.0097* **	I (0)	-1.9272	0.9730***	I (0)
D(m2)	-	-	-	-	-	-	-	-	-
dcr	-4.7358	0.0000* **	I (0)	0.5123	0.6958	-	22.4386	0.0000	-
D(dcr)	-	-	-	-4.5831	0.0000* **	I (1)	-1.0467	0.8524***	I (1)
rexr	0.0093	0.5037	-	0.3871	0.6507		31.1931	0.0000	
D(rexr)	-3.9913	0.0000* **	I (1)	-3.9154	0.0000* **	I (1)	-1.8879	0.9705***	I (1)
emp	-0.9533	0.1702		-0.3793	0.3522		24.3475	0.0000	
D(emp)	-5.0952	0.0000* **	I (1)	-4.3793	0.0000* **	I (1)	-1.0844	0.8609***	I (1)

Source: Culled from STATA 15 Output.

Note: The asterisk (***) ** and *) denotes rejection of the null hypothesis that the series has a unit root at 1%, 5%, and 10% level of significance.

The results of panel unit root tests are presented in Table 2 using the Levin, Lin, and Chu (2002) unit-root test and Im, Pesaran, and Hadri LM unit-root test, indicate that most panels do not contain unit roots at levels except for gross domestic product growth (gdpgr) and money supply (m2) from the Levin-Lin-Chu unit-root test, Im, Pesaran, and Hadri LM unit-root test, the balance of payment from Levin-Lin-Chu unit-root test, domestic credit rate (dcr) from Levin-Lin-Chu unit-root test, monetary policy rate from Levin-Lin-Chu unit-root test and Im, Pesaran unit-root test. However, all the variables consumer price index (cpi), the balance of payment (bop), monetary policy rate (mpr), domestic credit rate (dcr), real effective

exchange rate (rexr), and employment level (emp) were integrated at first difference. Thus, the panels were estimated using non-stationary heterogeneous panel models.

4.1.2 Panel Cointegration Test

Table 3: Panel Cointegration Test Results

Monetary Policy and Balance of Payment		
	Statistics	P Value
Kao Test (Modified Dickey-Fuller t)	-2.8832	0.0020
Pedroni (Modified Philips-Perron t)	2.4488	0.0072
Westerlund	-3.1612	0.0019

Source: Extract from Stata 15 Output

Table 3 shows the result of the Dickey-Fuller t, Philip-Perron t, and Westerlund, at 5%, and 10% level of significance. All the models under the Panel Kao, Pedroni test and Westerlund Statistic show a long-run relationship meaning that the null hypothesis was accepted at the 5% level of significance. This means there is a long-run relationship among all the variables in the model.

4.1.3 Multicollinearity Test

Table 4: Correction Matrix

	BOP	RIR	M2	DCR	REXR
BOP	1				
RIR	0.1327	1			
M2	0.1656	-0.0331	1		
DCR	0.0782	0.0222	-0.0446	1	
REXR	0.1252	0.7384	0.0075	-0.1247	1

Source: Extract from Stata 15 Output

The results obtained from the Pearson Product Moment correlation matrix in Table 4 above, indicate that all the variables have a low positive relationship with the balance of payment. So, on the whole, the paper can confirm that there is no pair-wise correlation coefficient in the model of the paper that is over 0.80 (Gujarati and Porter, 2006).

4.2 Empirical Result: Evaluating the Effect of Monetary Policy Regime on the Balance of Payment Equilibrium in West Africa

To evaluate the effect of the monetary policy regime on the balance of payment in West Africa, the paper performed the Hausman test to determine which of PMG and MG is appropriate to use in the estimation. The result of this is presented in Table 5;

Table 5: Hausman Test Results for the Balance of Payment Model

MG vs PMG				
Variables	(b)	(B)	(b-B)	Sqrt(diag(V_b-V_B))
	MG	PMG	Difference	S.E
Mpr	1.228618	0.1194777	1.10914	1.068631
m2	0.0887093	-0.0214986	0.1102079	0.1277348
Dcr	-0.7153097	-0.8900241	0.1747144	0.9993828
Rexr	-0.0584528	-0.1167056	0.0582529	0.0791291
Chi-square (4) = 5.23				
Prob.=0.2645				

Source: Authors' Computed from STATA 15 Output

The result in Table 5 shows the chi-square value of 5.23 with a probability value of 0.2645. Since the probability value is greater than 0.05 (at a 5% level of significance), the paper fails to reject the null hypotheses and concludes that the PMG estimator is most preferred over the MG estimator for the balance of payment model. That is the PMG estimator is more efficient and it means that the analysis is along short-run individual country-specific effects (heterogeneity) and long-run homogenous estimates.

Table 6: Short-run Impact of monetary policy and balance of payment

Country	ec	D1.lbop	D1.mpr	D1.m2	D1.dcr	D1.rexr	_cons
Gambia	-0.25452 (0.151804) 0.094*	-0.2217 (0.223682) 0.322	-0.02166 (0.052016) 0.677	0.045049 (0.069535) 0.517	0.320953 (0.561638) 0.568	0.004799 (0.075992) 0.95	2.910365 (2.104089) 0.167
Ghana	-1.55268 (0.152994) 0.000***	-1.15254 (0.116212) 0.000***	-0.65044 (0.112624) 0.000***	0.021909 (0.037435) 0.558	0.740419 (0.205135) 0.000***	0.10462 (0.059645) 0.079*	23.33077 (4.474342) 0.000***
Guinea	-0.013015 (0.007152) 0.069*	-0.43624 (0.17731) 0.014**	-0.359 (0.912152) 0.694	0.105641 (0.05357) 0.049**	-1.1124 (1.516955) 0.463	-0.00942 (0.003585) 0.009***	-2.61577 (6.467473) 0.686
Liberia	-0.5231 (0.149282)	0.106996 (0.162767)	0.59352 (0.270158)	0.376002 (0.13678)	-0.4542 (3.234936)	0.454865 (0.185282)	-5.58485 (4.362)

	0.000***	0.511	0.028**	0.006***	0.888	0.014**	0.200
Nigeria	-0.32543	0.17782	-0.20503	0.00378	0.648892	-0.00441	8.385648
	(0.126902)	(0.189328)	(0.115803)	(0.033204)	(0.364962)	(0.103796)	(3.477687)
	0.01**	0.348	0.077*	0.909	0.075*	0.966	0.016**
Sierra Leone	-0.98114	-0.71159	0.069457	0.171434	3.104488	-0.16194	0.836627
	(0.383519)	(0.271545)	(0.186259)	(0.279358)	(4.176633)	(0.285312)	(3.158483)
	0.011**	0.009***	0.709	0.539	0.457	0.57	0.791

Source: Authors' Computed from STATA 15 Output.

Note: The first figure in each cell is the estimated coefficient while the second and the third are their respective standard errors and probability values. The figures in parentheses () are the standard errors of the estimates. This paper used a 5% level of significance upon which the statistical significance of the estimated variables was examined. The asterisk (***) (** and *) denotes rejection of the null hypothesis which implies that the estimate of the variable is highly significant at 1%, 5%, and 10% levels of observed significance respectively.

The result in Table 6 reveals that the coefficient of monetary policy rate for the Gambia, Ghana, Liberia, and Nigeria have a negative effect on the balance of payment in West Africa in the short-run except for Liberia which was positive, with that of Ghana, Liberia, and Nigeria exhibiting statistically significant effect on the balance of payment. On the other hand, the value of the monetary policy rate for Guinea and Sierra Leone displayed a positive and a negative but statistically insignificant effect respectively on the balance of payment in the short run at 5per percent level. The outcome of the effect of money supply on the balance of payment was positive in all the countries in West Africa in the short run, only Guinea, and Liberia was statistically significant. The coefficients of domestic credit for Gambia, Ghana, Nigeria, and Sierra Leone displayed a positive effect on the balance of payment. However, the domestic credit to the private sector for Guinea and Liberia showed a negative effect on the balance of payment. But, only that of Ghana and Nigeria were statistically significant. Also, the real effective exchange rate revealed a positive and statistically significant effect in Ghana and Liberia, and Guinea, had a negative and statistically significant effect on the balance of payment in the short run in West Africa. The outcomes of the other variables for other countries were not statistically significant, so they cannot explain changes in the balance of payment in those countries.

From the result of the error correction terms, the speed of adjustment coefficients for all 6 countries in West Africa shows negative estimates that are statistically significant at 1

percent, 5 percent, and 10 percent levels. This implies that in case of any initial distortion, the distortions would converge towards long-run equilibrium at a rate of 9% in the Gambia, shortest possible time in Ghana, Guinea, Liberia, Nigeria, and Sierra-Leone respectively at the 1 percent, 5 percent and 10 percent level of significance.

Table 7: Long-run effect of monetary policy and balance of payment

D.bop	Coefficient	Standard Error	Z	P> Z	95% Conf. Interval	
mpr	0.1194777	0.0534072	2.24	0.0250**	0.0148017	0.2241538
m2	-0.0214986	0.0332938	-0.65	0.5180	-0.0867533	0.0437561
dcr	-0.8900241	0.0950702	-9.36	0.0000***	-1.076358	-0.70369
rexr	-0.1167056	0.0184375	-6.33	0.0000***	-0.1528424	-0.0805689

Source: *Authors' Computed from STATA 15 Output.*

*** ** and * denote rejection of the null hypothesis which implies that the estimate of the variable is highly significant at 10%, 5%, and 1% levels of significance respectively.

Table 7 represents the long-run estimates of the effect of the monetary policy rate on the balance of payment in West Africa. Accordingly, the monetary policy rate exhibits a positive influence on the balance of payment in the long run and is statistically significant at a 1 percent level, contrary to the finding of Bashir and Sam-Siso (2020) but conforms to the finding of Jong-Suk and Hur (2020). The implication is that the monetary authority's decision on monetary policy affects the balance of payment positively in West Africa. On the other hand, the money supply exhibits a negative and statistically insignificant effect on the balance of payment in West Africa. This implies that money supply does not explain changes in the balance of payment, this agrees with the finding of Osakwe, Ibenta, and Ezeabasili (2019) but is contrary to that of Olakanmi and Olagunju (2020). The negative impact of money supply can hurt lending interest rates thereby limiting the credit available to the core private sector involved in productive activities. To substantiate the above result, domestic credit exerts a negative and statistically significant decreasing effect on the balance of payment. For the real exchange rate, the result shows a negative and statistically significant effect on the balance of payment. This implies that the exchange rate depreciation can lead to an improved balance of payments position if fiscal discipline is imposed. This outcome is consistent with economic theory such as exchange rate depreciation will improve the balance of payment position due to the increase in net export balance, which conforms to the finding of Bashir and Sam-Siso

(2020). The result seems to suggest that the balance of payment exhibits the likelihood to be improved using exchange rate devaluation.

In evaluating the effect of the monetary policy regime on the balance of payment in West Africa, the paper complements the result obtained by examining the granger-causality between the variables of the paper. The result of this is presented in Table 8;

Table 8: Granger non-causality test results

Null Hypotheses	HPJ Wald test	P-value (Z-bar)
mpr does not Granger-cause bop	0.0009	0.9766
bop does not Granger-cause mpr	0.6652	0.4147
m2 does not Granger-cause bop	6.0291	0.0141**
bop does not Granger-cause m2	0.3183	0.5726
dcr does not Granger-cause bop	0.4365	0.5088
bop does not Granger-cause dcr	0.4803	0.4883
rexx does not Granger-cause bop	12.4727	0.0004***
bop does not Granger-cause rexx	0.0605	0.8057

Source: Authors' Computed from STATA 15 Output.

Note: The asterisk (***) ** and *) denotes rejection of the null hypothesis at 1%, 5%, and 10% levels of significance.

The result in Table 8 reveals that there is no causal relationship running from both monetary policy rates to the balance of payment and vice versa for at least one country in West Africa at a 5% level of significance. This implies that changes in monetary policy do not granger-cause the balance of payment in West Africa. The paper also found that a money supply granger caused a balance of payment in at least one country in West Africa at a 5% level of significance without a feedback mechanism. The paper also shows the absence of a causal relationship running from the domestic credit rate to the balance of payment and vice versa implying that an increase in the level of domestic credit rate in the country may not affect the balance of payment in at least one country in the West Africa and vice versa. Lastly, the paper reveals a unidirectional relationship between the real exchange rate and balance of payment in West Africa but not vice versa. The implication is that changes in the real exchange rate have the capability of influencing changes in the balance of payment significantly, while changes in the balance of payment do not granger-cause the real exchange rate.

4.3 Discussion of Results

The short-run result reveals that the coefficient of monetary policy rate for the Gambia, Ghana, Liberia, and Nigeria negatively affects the balance of payment in the short-run except for Liberia which was positive, with that of Ghana, Liberia, and Nigeria exhibiting statistically significant effect on the balance of payment. This is in agreement with economic theory as an increase in the interest rate and inflation worsens the balance of payments position. This is because an increase in the interest rate leads to an increase in the value of the national currency. The prices of imported goods will fall relative to the prices of domestic goods and services. Export competitiveness decreases and income decreases. Imports rise and exports fall, reducing total spending and the net export component of demand. On the other hand, monetary policy interest rates in Guinea and Sierra Leone showed positive and negative values, respectively, but were not statistically significant in the short-term balance of payments. Hence, those variables did not explain the changes in the balance of payment for those countries in the period of the paper.

The outcome of the effect of money supply on the balance of payment was positive in the countries in the short-run, with only that of Guinea and Liberia statistically significant. This affects the prices of goods and services thus, exports and imports. If the supply of money increases through an expansion of domestic credit, it will cause a deficit in the balance of payments, an increase in the demand for goods and various assets, and a decrease in economic aggregates. The increase in money supply reduces the value of money which in turn makes local commodities expensive relative to those imported. These changes in a country's balance of payment can cause fluctuations in the exchange rate between its currency and foreign currencies

The long-run estimates indicate the positive and significant effect of the monetary policy rate on the balance of payment in West Africa. The implication is that the monetary authority's decision on monetary policy affects the balance of payment positively. On the other hand, the money supply exhibits a negative and statistically insignificant effect on the balance of payment. This implies that the money supply does not explain changes in the balance of payment. Contrary to the result stated above, the Granger-causality test reveals that there is no causal effect from monetary policy rate to balance of payment and vice versa in any of the countries in West Africa. This implies that changes in monetary policy do not the granger-cause balance of payment in the zone. The paper also found that money supply and real

effective exchange rate unilaterally granger cause a balance of payment in at least one country in West Africa without a feedback mechanism. The error correction terms indicate statistical significance in all the 6 countries of West Africa. This implies that in case of any initial distortion, the distortions would converge towards long-run equilibrium in a very short period.

In conclusion, the results obtained for monetary policy regimes' effect on the balance of payment in West Africa indicate that the monetary policy rate and money supply can be used to achieve the objective of balance of payment equilibrium in the short run. The monetary policy rate was significant in Ghana, Liberia, and Nigeria, while the money supply was effective in Guinea and also in Liberia. But, in the long run, only the monetary policy rate had a significant effect on the balance of payment, as the money supply tool indicates insignificance in the long run. These results are especially significant given the aspiration of unifying the monetary policy regime in the Economic Community of West African States (ECOWAS) in 2027.

5. SUMMARY OF FINDINGS AND CONCLUDING REMARKS

This paper set out to examine the monetary policy regimes and macroeconomic performance in West Africa. But its specific goal was to ascertain how different monetary policy regimes affect the payment balance. The balance of payments was used as the paper's dependent variable, and the money supply, exchange rate, and credit to the private sector served as its explanatory variables. According to the findings, the various monetary policy regimes that were put into place in West Africa had conflicting effects on the balance of payments. It demonstrates how that goal can be short-term achieved using the money supply and monetary policy rate. Ghana, Liberia, and Nigeria experienced notable monetary policy rates, while Guinea and Liberia once more experienced effective money supply. However, over time, only the monetary policy rate had a significant impact on the balance of payments, as the money supply tool shows to be insignificant. Given the goal of unifying the monetary policy regime in the Economic Community of West African States (ECOWAS) in 2027, these results are particularly important.

Based on the findings of the paper, and the conclusion thereof, the paper recommends that to achieve a balance of payment equilibrium in West Africa, the monetary policy rate is an effective tool, this is because it is significant in explaining the changes in the balance of payment in the countries in West Africa. Although it exerts a negative effect on the Gambia,

Ghana, Liberia, and Nigeria in the short run, this is reversed in the long run. So, monetary authorities should ensure a correct balance of the rate when to increase or decrease the monetary policy rate with the hindsight of implications on the current account. Also, there should be cooperation between the monetary and fiscal authorities in West Africa to ensure smooth coordination and consistency in monetary and fiscal pursuits. Put differently, the combination and coordination of both monetary and fiscal policies are highly recommended.

REFERENCES

- Abille, B. A and Meçik, O. (2022). “Macroeconomic determinants of balance of payments performance in selected African countries”.
- Adabor, O. & Buabeng, E. (2020). Does monetary policy and foreign direct investment have an influence on the performance of stock market: further evidence from Ghana. *Economic Literature*, 2(2), 161-176
- Adediran, O.S, Matthew, O.A, Olopade, B.C. & Adegboye, F.B. (2017). “Monetary policy shocks and inclusive growth in Nigeria: A VAR approach”. *International Journal of Humanities & Social Studies* 5 (2), 173-179.
- Aderemi, T.A., Soyemi, C.O., Alaka, A. & Efunbajo, S.A. (2019). Monetary policy and macroeconomic variable performances in Nigeria: bound test, ARDL, and ECM approach. *International Journal of Accounting Research*, 6(1), 21-26
- Amassoma, D. Ogbuagu, I. M and Olaosebikan, B. (2020). “Re-investigating the Effect of Monetary Approach to Balance of Payment Adjustment in Nigeria”. *Chiang Mai University Journal of Economics – 24#2*
- Asongu, S.A., Folarin, O.E., & Biekpe, N. (2019). The long run stability of money demand in the proposed West African monetary union. *Research in International Business and Finance* 48, 483–495

- Atoi, N. V. (2020). "Monetary Approach to Balance of Payments in a Small Open Economy: The Nigeria Experience". Online at <https://mp.ra.ub.uni-muenchen.de/99708/> MPRA Paper No. 99708, posted 21 Apr 2020 10:25 UTC.
- Ayomitunde, T. A., Soyemi, C. A., Adedayo, A., and Adekunle, S. E. (2020). "Monetary policy and the performances of macroeconomic variables in Nigeria". *International Journal of Accounting Research (IJAR)* Vol. 5 (1), pg 21-26
- Bashir, A.W. & Sam-Siso, E.O. (2020). Does monetary policy stimulates macroeconomic performance during economic downturn in Nigeria. *Journal of Social Sciences*, 16, 23-36
- Bertasiute, A., Massaro, D. & Weber, M. (2020). The behavioural economics of currency unions: economic integration and monetary policy. *Journal of Economic Dynamics and Control*, 112, 1-32
- Folarin, O. E., & Asongu, S.A. (2019). Financial liberalization and long-run stability of money demand in Nigeria. *Journal of Policy Modeling* (forthcoming).
- Gnahe, F. E., & Huang, F.-M. (2020). "The Effect of Monetary Policy on Economy Growth of WAEMU Countries". *Open Journal of Business and Management*, 8, 2504-2523.
- F. H. Hahn (1959). "The Balance of Payments in a Monetary Economy," *Review of Economic Studies*, Oxford University Press, vol. 26(2), pages 110-125
- Hill, R. C., Griffiths, E. W. and Lim, C. G (). "Principles of Econometrics" Third (3rd) Edition [Hil] on Amazon.com
- IMF (2023). West African Economic and Monetary Union Staff Report on Common Policies for Member countries. Country Report No. 23/102.
- Jong-Suk, H. & Hur, J. (2020). Macroeconomic stability and monetary policy in Korea: time-varying coefficient VAR approach.
- Khan, A. M. (2023). "Does Monetary Policy Solely Correct Disequilibrium in the Balance of Payment? Evidence From the Developing World. *Journal of Central Banking Theory and Practice*, 2023, 1, pp. 57-85

- Levin, A., Lin, C., and Chu, J. C. (2002). “Unit root tests in panel data: asymptotic and finite-sample properties”. *Journal of Econometrics*, vol 108 (1)
- Mundell, A. R. (1968). *International Economics*. New York, The Macmillan Company, London, Collier-Macmillan
- Nwoko, N.M., Ihemeje, J.C. & Anumadu, E. (2016). The impact of monetary policy on the economic growth of Nigeria. *African Research Review*, 10(3), 192-206
- Ocheuje, L.P. (2021). “Understanding balance of payments and its link with monetary policy in Nigeria”. *CBN Bullion*, 45 (2), 32 – 45
- Odinaka, Nkwagu, Nkwagu and Chinedu,(2021). “Impact of Monetary Policy Instruments on Balance Of Payments in Nigeria”. *IOSR Journal of Economics and Finance (IOSR-JEF)* e-ISSN: 2321-5933, p-ISSN: 2321-5925. Volume 12, Issue 5 Ser. IV (Sep. – Oct. 2021), PP 62-72.
- Olakanmi, O.A. & Olagunju, O. (2020). Monetary policy and inclusive growth in Nigeria. *International Journal of Development and Economic Sustainability*, 8(2), 1-9
- Olamide, E., Maredza, A. & Ogujuiba, K. (2022). Monetary policy, external shocks and economic growth dynamic in East Africa: an SVAR model. *Sustainability*, 14, 1-19
- Olayungbo, D.O. (2019). Bayesian graphical model application for monetary policy and macroeconomic performance in Nigeria. Retrieved from:
<http://creativecommons.org/by/3.0>
- Oluwole. O. F., and Oloyede, A. J. (2020). “Test of Monetary Approach to Balance of Payments in West Africa Monetary Zone”. *Australian Finance & Banking Review*; Vol. 4, No. 1;ISSN 2576-1196 E-ISSN 2576-120X
- Onye, K. & Umoh, O. J. (2021). Fiscal policy and monetary integration in the ECOWAS. *AERC CREA, Policy brief*, 762
- Osakwe, A. ., Ibenta, S. N. ., & Ezeabasili, V. N. (2019). Monetary Policy and the Performance of the Manufacturing Sector in Nigeria (1986-2017). *International Journal of Academic Research in Business and Social Sciences*, 9(2), 399–413

- Osisanwo G. B. Tella, A. S, and B. A. Adesoye (2019). "The Empirical Analysis of Monetary Policy on Balance of Payments Adjustments in Nigeria: A Bound Testing Approach". *Iran. Econ. Rev.* Vol. 23, No. 1, 2019. pp. 129-147
- Pesaran, M.H. and Smith, R. (1995) Estimating Lon-Run Relationship from Dynamic Heterogeneous Panels. *Journal of Econometrics*, 68, 79-113.
- Sri, H. & Imronjana, S. (2016). Dual monetary system and macroeconomic performance in Indonesia. *Journal of Islamic Economics*, 8(1), 65-80
- Tule, M. K., Ajilore, T., & Ujunwa, A. (2019). Monetary Policy Contagion in the West African Monetary Zone. *Foreign Trade Review*, 54(4), 375-398.
- Ufoeze, L.O., Odimgbe, S.O., Ezeabalisi, V.N. & Alajekwu, U.B. (2018). Effect of monetary policy on economic growth in Nigeria: an empirical investigation. *Annals of Spiru Haret University*.
- Ujunwa, A., Onah, E., Ujunwa, A. I., Okoyeuzu, C. R., & Kalu, E. U. (2022). Financial innovation and the stability of money demand in Nigeria. *African Development Review*.
- Xiao, J. & Juodis, A. & Karavias, Y. & Sarafidis, V. (2021). "Improved Tests for Granger Non- Causality in Panel Data," *Discussion Papers* 21-06.