Monetary Policy and Balance of Payments Accounts Nexus: Evidence from Nigeria

By

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Abstract
The study investigated the effect of monetary policy on balance of payment accounts of Nigeria from 1982 to 2023. The variables of the study consisted of Total account balance (TAB) which proxy for balance of payments account, nominal interest rate (NIR), exchange rate (EXR), money supply (MSP), and domestic assets prices (DAP) which are proxy for monetary policy. The research data were sourced from the World Development Indicator of the World Bank. The model estimation was achieved using Autoregressive Distributed Lags (ARDL) method with generated short run and long run results from the analysis. The result showed that in the short run, EXR and DAP had mixed effect on TAB. While NIR significantly increased TAB in the short run, growth in MSP significantly led to a fall in TAB in Nigeria. In another light, the long run result disclosed that at 5 percent level, NIR had no evidence of long run impact on TAB in Nigeria. On the other hand, there was empirical evidence of significant long run impact of EXR and DAP on TAB respectively. However, the study established that in the long run, growth in MSP significantly led to a decline in TAB position in the economy. Overall, the result of the study suggests that monetary policy instruments such as NIR, EXR, MSP and DAP can be used by policy makers in adjusting total account position in the economy. Further analysis conducted by the study on post estimation basis showed that the model, had structural stability and was free from the issues of serial correlation, heteroskedasticity, and misspecification errors at 5 percent level of significance. The study however, recommended that expansionary monetary policies by the Nigerian government to regulate money supply should be highly monitored to mitigate its detrimental impact on the total account balance.

Keywords: Monetary policy, Total Account, Interest rate, Exchange rate, Money supply

Introduction

The effectiveness of monetary policy in changing aggregate economic activity and economic growth largely depends on how monetary policy is conducted and the independency of the central bank to choose the appropriate monetary tools (Nkoro, 2021). Monetary policy, is concerned with the utilization of the central bank's monetary weapons to control and regulate the availability of credit in the economy in order to achieve the objectives of price stability, increased economic growth, and improvements in the balance of payments. Monetary policy in this regard is highly important since it maintains the internal targets of the economy as well as monitors the external balance. Therefore, monetary policy performs the dual goal of stabilizing interest rate (in order to maintain output and price level) and exchange rate (the aim is to maintain competitiveness in international trade) (Tarawalie & Kpana, 2022).

Monetary policy is expected to bring about economic development via its influence on macroeconomic objectives. Its influence on macroeconomic objectives is through movements in the intermediate variables such as interest rate, exchange rate, money supply among others which could alter the position of balance of payments (BoP) and total account balance in the

economy. Knowledge of the magnitude, timing, and persistence of monetary policy shocks (actions) on economic activities provides the monetary authorities with vital information required to fine-tune policy initiatives towards stabilizing the macroeconomy as well as achieving sustainable development Nkoro (2021).

Persistent BoP imbalances in many countries, especially the developing ones has stirred concern among policymakers and international institutions such as the International Monetary Fund (IMF) and the World Bank (WB) (Alshyab & Abu-Murad, 2023). The total account balance of any nation cannot decouple itself from the adverse effect of imbalances in BoP. This is because total account balance is the sum of the main components of BoP which are; current account, capital account, and financial account balance. The total account balance shows whether a country has a surplus or deficit from its combined external trade and financial transactions. Nigeria's current account and financial account have suffered imbalances over the years thus this should suggest that total account balance in Nigeria has equally suffered imbalances (Danmola et al., 2013). It follows that for Nigeria to effectively achieve a favourable total account position, the use of monetary policy transmission through the channels of interest rate, exchange rate, and money supply cannot be overemphasized. As Dunne and Makanzay (2017) would add, monetary policy transmission can be used to insulate the effects of endogenous and exogenous shocks and achieve stable adjustment of the total account balance in an economy. Therefore, it becomes imperative to investigate the effect of monetary policy on total account balance of Nigeria with key interest in assessing the impact nominal interest rate, exchange rate, money supply, and domestic assets prices on total account balance. This study is unique because empirical literature which captures the effect of monetary policy on total account balance in Nigeria is lacking.

Theoretical Framework

The Keynesian theory forms the basis for the theoretical framework of this study. Keynesian model assumes a close economy and a perfect competitive market with fairly price- interest aggregate supply function. The economy is also assumed not to exist at employment equilibrium and also that it works only in the short run because as Keynes aptly puts it '' In the long run, we also will be dead''. The Keynesian theory is rooted on one notion of price rigidity and possibility of an economy setting at a less than full employment level of output, income and employment. The Keynesian macro economy brought into focus the issue of output rather than prices as being responsible for changing economic conditions. In other records, they were not interested in the quantity theory per say. From the Keynesian in the mechanism, monetary

policy works by influencing interest rate which influences investment decisions and consequently, output and income via the multiplies process. Thus, the Keynesian theory is a rejection of Say's Law and the notion that the economy is self-regulating (Udude, 2014).

Empirical Review

Owing to the dearth of literature on works encompassing the subject of total account balance, the empirical review of this study was therefore designed to accommodate related literatures to the study. To this end, Batool et al. (2015) evaluated the relationship of balance of payments to its determinants in Pakistan. The robust ARDL structure was utilized to develop the bound testing approach to co-integration and error correction models on data set for 1972-2013.The bound test showed that there exists stable long run relationship of balance of payments to its determinants. The upshots indicate that real exchange rate inversely influences the balance of payments not only in the long run but also in the short run. Interest rate inversely affects the balance of payment in the long run but positively affects in the short run. Fiscal balance affects the BoP negatively in the long and short run simultaneously. As regards the real GDP, it moves the BoP in the positive direction in both long and short run. The money supply cast positive influence on the BoP in the short run but negative effect in the long run.

Dare and Elijah (2020) on the other hand examined the policy effect and implication of exchange rate on balance of payments in Nigeria. Secondary data which covered the period of 1986 to 2018 were obtained from Central Bank of Nigeria Statistical Bulletin. Augmented Dickey – Fuller (ADF) and Bound Test were conducted to test for stationarity and long run relationship among exchange rate, money supply, trade openness, inflation and balance of payments. Pairwise casualty test was also conducted to ascertain the direction of causality between exchange rate and balance of payments. In line with the unit root result, Autoregressive Distributed Lag (ARDL) was employed for analysis. The ARDL result revealed that exchange rate and trade openness stimulate overall balance payments performance in Nigeria while the causality result showed independent relationship between exchange rate and balance of payments in Nigeria.

Further, Tarawalie and Kpana (2022) investigated the effect of monetary policy and exchange rate fluctuations on trade balance in Sierra Leone using the autoregressive distributed lag (ARDL) bound testing framework with annual times series data covering the period 1980 to 2020. The results from the unit root test revealed a combination of I(0) and I(1) series, while the bound test result confirms there is cointegration, which validates the existence of a long-

run relationship. The long run results reveal that, money supply, real effective exchange rate and real GDP are the main determinants of trade balance in Sierra Leone. The findings indicate that money supply and real effective exchange rate have negative impact on trade balance, whilst a positive relationship exists between real GDP and trade balance. Furthermore, results from the beta coefficients confirm that real GDP has the greatest effect on trade balance in the long run, followed by real effective exchange rate, whilst money supply has the least effect. Also, the short run ARDL error correction model results reveal that real GDP, government expenditure and foreign direct investment are the main determinants of trade balance in Sierra Leone.

More so, Akpansung (2021) examined the impact of the real effective exchange rate variations on the overall balance of payments in Nigeria between 1986-2019. The autoregressive distributed lag (ARDL) bounds cointegration technique was used to analyse the data based on the outcome of the stationarity test. The bounds test indicated a long-run relationship among the macroeconomic variables in the balance of payments function. Empirical evidences indicated that real exchange rate had insignificant negative effect on the balance of payments in the long-run, but exerted significant positive effect in the short-run with a lag. Private sector credit impacted negatively in the long-run, while real output significantly improved balance of payments both in the long-run and in the short run with a lag. Lagged real interest rate and oil prices had significant positive short-run impacts, while the latter impacted negatively in the long-run. Overall, the result implied that real exchange rate depreciation may not be used to improve Nigeria's balance of payments position.

In addition, Oluyemi and Olufemi (2020) evaluated the roles of Monetary Policy on Balance of Payment in Nigeria. This study used quarterly data spanning from 1981 to 2017 and the data were sourced from Central Bank of Nigeria statistical bulletins and National Bureau of Statistics. Relevant literature was reviewed in the study ranging from conceptual issues, theoretical literature to the empirical studies of past researchers. Co-integration analysis and Error Correction model were employed to capture the stated objectives. The result of the study revealed that the variables are stationary at levels and at the first difference that necessitated the use of ARDL co-integration analysis. The ARDL bound test showed that there is no long-run relationship between monetary policy and the balance of payment. The result of the short-run ARDL Error Correction Model, therefore, revealed that MPR, INT, and M2 exhibit insignificant negative relationship with the balance of payment while there is an insignificant positive relationship between exchange rate, openness, and balance of payment

Methodology

Research Design/Data and Sources

Ex post facto research design was adopted in this study. The data were analysed, interpreted and tested in order to facilitate a valued conclusion on the effect of monetary policy variables on total account balance. Further the study utilized the Autoregressive Distributed Lags (ARDL) method in estimating the data. Also the study employed annual time series data which spanned from the period of 1982 to 2023. The data were all obtained from the World Development Indicators.

Model Specification

The functional form of the model is:

$$TAB = f(NIR, EXR, MSP, DAP) \quad (1)$$

Stated in linear form gives;

$$TAB = a_{\circ} + a_1 NIR + a_2 EXR + a_3 MSP + a_4 DAP + \mu \quad (2)$$

Formulating the Autoregressive Distributed Lag (ARDL) long-run model gives;

$$\Delta(TAB)t = a_{\circ} + a_1(TAB)t + a_2(NIR)t + a_3(EXR)t + a_4(MSP) + a_5(DAP) + \sum_{i=1}^{n} \Delta a_1 (TAB)_{t-1} + \sum_{i=1}^{n} \Delta a_2 (NIR)_{t-1} + \sum_{i=1}^{n} \Delta a_3 (EXR)_{t-1} + \sum_{i=1}^{n} \Delta a_4 (MSP)_{t-1} + \sum_{i=1}^{n} \Delta a_5 (DAP)_{t-1} + \mu_{1t} \quad (3)$$

The short-run Error Correction Model derived from the ARDL model would be;

$$\Delta(TAB)t = \lambda_{\circ} + \lambda_1(TAB)t + \lambda_2(NIR)t + \lambda_3(EXR)t + \lambda_4(MSP)t + \lambda_5(DAP)t + \sum_{i=1}^{n} \Delta\lambda_1 (TAB)_{t-1} + \sum_{i=1}^{n} \Delta\lambda_2 (NIR)_{t-1} + \sum_{i=1}^{n} \Delta\lambda_3 (EXR)_{t-1} + \sum_{i=1}^{n} \Delta\lambda_4 (MSP)_{t-1} + \sum_{i=1}^{n} \Delta\lambda_5 (DAP)_{t-1} + \Pi ECM + \mu_{2t} \quad (4)$$

Where:

TAB = Total account balance; NIR = Nominal interest; EXR = Exchange rate; MSP = Money supply; DAP = Domestic asset prices; a_0= $Respective intercept of the models$; $a_1 - a_4$= $Slopes of the models respectively$; $a_1 - a_5$= $Long - run dynamic coefficients$; $\lambda_1 - \lambda_5$ = Short − run dynamic coefficients; $\mu_{1t} - \mu_{2t}$ = $Disturbance or error term$; Δ= $First difference operator$; n = $Maximum lag lenght$; Π = $Error correction coefficient$; ECM = $Error\ correction term with one period lag$; f = $Functional Notaton$

Results and Discussion

Test of Unit Root

The unit root test was carried out using Augmented Dickey Fuller (ADF) method. The result is presented in Table 1.

Table 1: Unit Root Test Result

Variable	ADF Test Stat.	5% Critical Value	P-value	Order of Integration	Test Option	Remark
TAB	-3.074273	-2.935001	0.0365	I(0)	Intercept	Integrated of order 0
NIR	-3.607107	-3.533083	0.0425	I(0)	Trend & Intercept	Integrated of order 0
EXR	-7.007475	-3.526609	0.0000	I(1)	Trend & Intercept	Integrated of order 1
MSP	-5.188148	-3.526609	0.0007	I(1)	Trend & Intercept	Integrated of order 1
DAP	-4.012603	-3.523623	0.0159	I(0)	Trend & Intercept	Integrated of order 0

Source: Author's computation from Eviews software, 2024

Table 1 indicates that TAB, NIR, and DAP series were stationary at level. Stationarity was conceivable because the ADF test statistic of the series had corresponding values of -3.074273, -3.607107, and -4.012603 which were more negative than their respective critical values of -2.935001, -3.533083 and -3.523623 at 5 percent level. On the other hand, EXR and MSP were not stationary at level but became stationary after being differenced once; suggesting that were integrated of order 1. It is safe to say that the series of the study have mixed order of integration.

Test of Cointegration

Table 2 shows the result of the test for cointegration among the variables.

Table 2: Bounds Cointegration Test Result

Test Statistic	Value	Signif.	I(0)	I(1)	Decision
F-statistic	5.487362	10%	2.2	3.09	
K	4	5%	2.56	3.49	Cointegrated
		2.5%	2.88	3.87	
		1%	3.29	4.37	

Note: K denotes number of explanatory variables
Source: Author's computation from Eviews software, 2024

The result of the ARDL bounds cointegration test in Table 2 shows that the value of the F-statistic of 5.487362 is greater than the upper-bound critical value of 3.49 at 5 percent level. This result suggests the existence of long run relationship between TAB and the independent variables.

Model Estimation

The result of the ARDL estimation model estimation is given in Table 3.

Table 3: Short Run and Long Run ARDL Results

Dependent Variable: TAB				
		Short run results		
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(NIR)	-0.204018	0.357992	-0.569894	0.5754
D(NIR(-1))	-0.020824	0.311697	-0.066809	0.9474
D(NIR(-2))	0.329362	0.319795	1.029916	0.3160
D(NIR(-3))	0.773810	0.329981	2.345013	0.0300
D(EXR)	0.067151	0.028913	2.322514	0.0315
D(EXR(-1))	0.081021	0.037752	2.146130	0.0450
D(EXR(-2))	-0.108796	0.057339	-1.897424	0.0731
D(EXR(-3))	-0.151184	0.057711	-2.619681	0.0169
D(MSP)	-0.997943	0.417598	-2.389720	0.0274
D(DAP)	0.729310	0.300886	2.423874	0.0255
D(DAP(-1))	-1.059692	0.344095	-3.079649	0.0062
D(DAP(-2))	-0.691682	0.302418	-2.287173	0.0338
D(DAP(-3))	-0.432951	0.274334	-1.578192	0.1310
CointEq(-1)*	-0.694163	0.107640	-6.448909	0.0000
		Long run results		
NIR	-0.725605	0.580931	-1.249039	0.2268
EXR	0.162737	0.045292	3.593058	0.0019
MSP	-2.951151	0.685103	-4.307601	0.0004
DAP	2.476277	0.557195	4.444186	0.0003
R-squared	0.790919			
Adjusted R-squared	0.677666			
Durbin-Watson stat	2.191480			

Source: Author's computation from Eviews software, 2024

Except in the third lag period of the short run, NIR did not exert any significant impact on TAB. It follows that in this lag period, NIR recorded a probability value of 0.0300 less than 0.05. Further, it was associated with a coefficient value of 0.773810 which suggests that for every 1 unit increase in NIR, TAB will increase by 0.773810 unit. In the long run however, NIR did not determine changes in TAB at 5 percent level. This result suggests that the performance of TAB in the long run is not a function of NIR outcomes. In another light, EXR

in the short run had mixed effect on TAB; in the first and second lag period, it had significant positive impact on TAB, however, in the third lag period it took a negative turn. In the long run though, its impact on Tab was nevertheless positive. This is on the premise that the probability value of 0.0019 associated with NIR in the long run is significant at 5 percent level. Table 3, further shows that under the evaluation period, in the short run and long run, MSP was consistent in its shape of impact on TAB. This is borne on the fact that in the short run and long run respectively, MSP had a significant negative impact on TAB at 5 percent level. In contrast, while the in the current and first lag periods, DAP had a significantly negative impact on TAB, in the long run, it exerted a significant positive impact on the latter.

Table 3 also shows the information about the error correction term with the value of -0.694163 which is statistically significant at 5 percent level of significance and appropriately signed. This result suggests that the short-run disequilibrium adjustment towards long-run equilibrium will occur at the speed of 69.42 percent annually. On the other hand, the R-squared value of 0.790919 indicates that about 79.09 percent of the variations in the dependent variable are explained by the independent variables. Thus, demonstrating that the model is a good fit.In addition, the Durbin-Watson statistic value of 2.191480 suggests that the model is free from the problem of autocorrelation.

Post Estimation Test Results

The results of the post estimation tests consisting of the Serial Correlation LM test, Heteroskedasticity Test, Ramsey RESET, CUSUM, and CUSUM of Squares (CUSUMSQ) test are presented in Table 4 and Figure 1 and 2 respectively.

Table 4: Result of Serial Correlation LM Test, Heteroskedasticity, and Ramsey RESET Test

Breusch-Godfrey serial correlation LM test	F-statistic	0.554591	Prob. F(1,18)	0.4661
	Obs*R-squared	1.135808	Prob. Chi-Square(1)	0.2865
Breusch-Pagan-Godfrey Heteroskedasticity	F-statistic	1.106081	Prob. F(18,19)	0.4137
	Obs*R-squared	19.44410	Prob. Chi-Square(18)	0.3650
Ramsey RESET	t-statistic	1.004761	Prob. Value	0.3283
	F-statistic	1.009544	Prob. Value	0.3283

Source: Author's computation from Eviews software, 2024

The result of the Breusch-Godfrey serial correlation LM test in Table 4 indicates that the model has no serial correlation problems within it because the probability value (0.2865) of the Obs*R-squared is greater than 0.05. Similarly, because the probability value (0.3650) of the Obs*R-squared is greater than 0.05 for the Breusch-Pagan-Godfrey Heteroskedasticity, the model is said to be free from the issues of heteroskedasticity. In another light, the model is also adjudged to have no misspecification error because, the Ramsey RESET test result shows that the F-statistic value of 0.3283 is greater than 0.05.

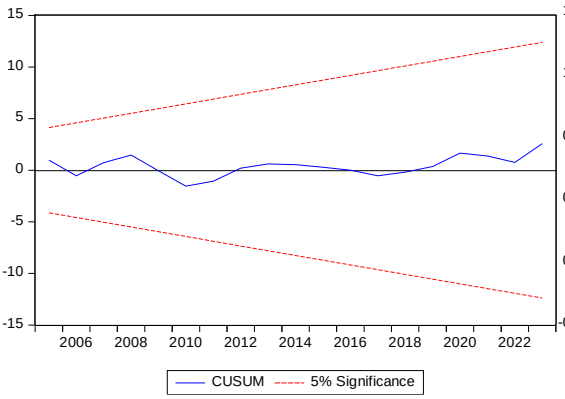

Figure 1: The Cumulative Sum Recursive Plot
Source: Authors estimation, 2024

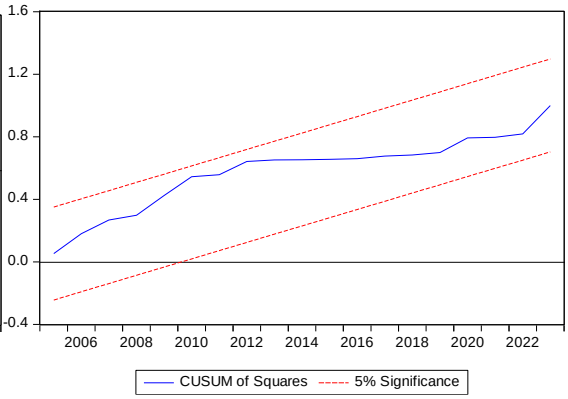

Figure 1: The Cumulative Sum of Squares Recursive Plot
Source: Authors estimation, 2024

The respective result of the CUSUM and CUSUM of Squares in Figures 1 and 2 indicates that the model has structural stability. Structural stability was conceived on the basis that the blue line in both plots is within the critical bounds at 5 percent. This is an indication that the results can be considered for policy formulation.

Discussion of Findings

The short run result shows that there is evidence of significant positive impact of NIR on TAB in the third lag within the sample period. This result indicates that past rate of interest from three years back influence the performance of total account balance; a rise in interest rates will cause the current account to become distorted since it will lower domestic production. However, the total account balance will improve overall as interest rate rises and draws in capital inflow into the economy. This result agrees with the work of Batool et al. (2015). The result on EXR shows that in the short run, EXR had mixed effect on total account balance. The unending fluctuations in exchange rate can lead to inexact economic implications for the nation. However, in the long run, the relationship was significantly positive. This suggests that foreign exchange rate management policies in Nigeria are effective in the long run to achieve

increase in total account balance. This result corroborates with the with the findings of Dare and Elijah (2020).

Further, the Nigerian economy witnessed a short run and long run negative impact of MSP on TAB. The justification of this result is that expansionary monetary policies such as an increase in the supply of money can lead to net outflow of capital in the economy. Also, an increase in money supply will result to an increase in the demand for imported goods through the income absorption effect. This can create a deficit in the current account with an overall negative impact on total account balance. In all, the result demonstrates that money supply is a key monetary policy instrument of total account position. This result aligns with the findings of Tarawalie and Kpana (2022) and Batool et al. (2015). On the order hand, DAP had mixed effect on TAB. Such that in the current period, DAP had positive impact on TAB. However, in the first and second lag periods it had a negative impact on the latter. This result goes to show how important past domestic asset prices are to the nation's current total account positions. The long run result nevertheless, indicates a significant positive impact of DAP on TAB. Typically, assets prices such as housing and equities affect consumption and investment. Increase in consumption leads to economic growth and investment which may open more opportunities for export by the domestic market. So overall, this boosts total account position in the economy.

Conclusion and Recommendations

This research evaluated the effect of monetary policy on balance of payments accounts in Nigeria from the period of 1982 to 2023 using Autoregressive Distributed Lags (ARDL) method. The main finding of the study is that, apart from nominal interest rate which had no long run effect on total account balance, all other monetary policy instrument (exchange rate, money supply, and domestic assets prices) significantly influence total account position in the Nigerian economy in the long run and the short run respectively. These finding has a paramount importance in policy implication in Nigeria and the global community.

Following the research outcomes, the study recommends that, the expansionary monetary policies by the Nigerian government to regulate money supply should be highly monitored to mitigate its detrimental impact on the total account balance. Policymakers and government should work together to find an interest rate that can improve the overall total account balance especially in the long run. In addition, the mixed effect of exchange rate on total account balance in the is a call on policy makers to design and implement foreign exchange policies on the short-run perspective that will have the desired uniform effect on total account balance.

References

Akpansung, A. O. (2021). Impact of real effective exchange rates on balance of payments: Empirical evidence from Nigeria. *African Journal of Economic Review*, 9(4). 272 – 290.

Alshyab, N. &Abu-Murad, M. (2023). Current account determinants in Jordan: An ARDL approach. *Review of Economics and Finance*, 21, 1784-1791.

Batool, S. A., Memood, T.& Jadoon, A. K. (2015). What determines balance of payments: A case of Pakistan. *Sukkur IBA Journal of Management and Business,* 2(1).

Danmola, R., Akonji, O. & Adijat, O. (2013). The impact of monetary policy on current account balance in Nigeria. *Journal of Humanities and Social Science*, 7(3), 67-72

Dare, F. & Elijah, A. O. (2020). Exchange rate and balance of payments in Nigeria. *EuroEconomica*, 39 (1), S. 73 - 83.

Dunne, J. P. & Makanzay, C. S. (2017). Current Account Dynamics and Monetary Policy Transmission in South Africa. Accessed 2nd Novenmber, 2024 from: https://ideas.repec.org/p/ctn/dpaper/2016-02.html

Nkoro, E. (2021). Monetary policy transmission mechanism and economic development: evidence from Nigeria. *International Journal of Economics, Commerce and Management*, 9(5), 259 – 289.

Oluyemi, B. & Olufemi, O.B. (2020). The Roles of Monetary policy on Balance of Payment in Nigeria. *International Journal of Management Studies and Social Science Research,* 2(3), 253 – 260.

Tarawalie, A. B., & Kpana, K. A. (2022). Monetary policy, exchange rate fluctuations and trade balance: The Sierra Leone Experience. *Modern Economy*, 2022, 13, 425-441.

Udude, C. C. (2014). Monetary policy and economic growth of Nigeria (1981-2012). *Journal of Policy and Development Studies*, 9(1). 234 – 247.