INTERACTION EFFECTS OF MONETARY AND EXCHANGE RATE POLICIES ON OIL AND NON-OIL TRADE BALANCE IN NIGERIA

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ABSTRACT

Motivated by persistent imbalances in Nigeria's external sector, this study examined the interaction effects of monetary and exchange rate policies on oil and non-oil trade balance. The study assessed how these policy instruments jointly influence Nigeria's trade balance components across sectors using time series data from 1981–2023. The study employed the Autoregressive Distributed Lag (ARDL) model to estimate both the short- and long-run relationships, including the interaction effects. The findings revealed that, in the short run, monetary policy rate and interest rate significantly influenced capital and consumer goods trade balance but had no significant effect on oil and non-oil trade balance. In contrast, the real exchange rate significantly affected all trade balance components. In the long run, monetary policy rate, interest rate, and real exchange rate significantly determined trade balance across all the sectors. Furthermore, monetary policy significantly moderates exchange rate effects in non-oil trade, but not in oil trade, while fiscal policy and institutional quality showed no significant moderating influence. Hence, we conclude that coordinated monetary and exchange rate policies are critical for improving trade balance outcomes. Based on the findings, the study recommends maintaining single-digit lending interest rates to enhance access to trade finance and stimulate non-oil export performance. The study also recommends that the Central Bank of Nigeria implement monetary policy easing to lower interest rates and facilitate credit access for businesses, thereby enhancing competitiveness and affecting exchange rates.

Keywords: *Exchange rate policy, monetary policy, oil and non-oil sector, trade balance*
JEL Code: *E52, F31, F14,*

1. Introduction

A country's balance of trade (BOT), defined as the difference between exports and imports of goods and services, is a key indicator of economic performance and external competitiveness. A surplus occurs when exports exceed imports, while a deficit arises when imports surpass exports (Bhat & Bhat, 2021). As a major component of the current account within the balance of payments framework, the trade balance reflects a country's interaction with the global economy and its capacity to sustain external equilibrium.

In Nigeria, the trade balance has exhibited significant fluctuations over time, largely driven by the dominance of the oil sector and structural weaknesses in the economy. For instance, the oil trade balance rose from a surplus of N10, 560.70 million in 1981 to N7, 454.60 million in 1986, then rose again to N24, 632.50 million in 1988. The trade balance peaked in 1992 by recording N181,822.40 million and finally increased to N14,375,136.87 million in 2022 CBN (2022). While the oil sector has recorded periods of substantial surpluses, the non-oil sector has persistently experienced trade deficits, reflecting the country's heavy dependence on crude oil exports and high importation of consumer and capital goods. Despite being one of Africa's largest economies and a leading oil exporter, Nigeria continues to face recurring trade imbalances, exacerbated by global oil price volatility, weak industrial capacity, and limited value addition in exports (Metu et al., 2019). Previous policy interventions, including the Structural Adjustment Programme (SAP) and the National Economic Empowerment and Development Strategy (NEEDS), have yielded limited success in reversing this trend.

Monetary and exchange rate policies play a central role in influencing trade flows and external balance. Monetary policy is measure used in regulating the supply, value and cost of money, essential for price stability and economic growth (Nwoko, Ihemeje & Anumadu, 2016). It is implemented by the Central Bank of Nigeria (CBN) to regulate money supply, stabilize prices, and promote economic growth through instruments such as interest rates and reserve requirements. According to CBN (2023), the monetary policy rate (MPR) varies, rising from 10% in 2006 to 18.75% in 2023. Exchange rate policy, on the other hand, affects international competitiveness by determining the relative price of domestic goods in global markets. Nigeria has experienced various exchange rate regimes, from fixed to managed and more recently market-driven systems, each with mixed implications for trade performance. The Central Bank of Nigeria operated a multiple exchange rate system from 2014 to mid-2023 to improve foreign exchange allocation, but replaced it with a unified market-driven rate due to mixed outcomes (Ozili, 2024). Similar reforms have been implemented in countries such as Cuba, Australia, and Canada.

Existing literature provides mixed evidence on the effectiveness of monetary and exchange rate policies in influencing trade balance, with many studies focusing on aggregate outcomes while neglecting sectoral and goods-specific dynamics (Adeniran & Ogunbiyi, 2021; Tells, Adeniran & Omoloye, 2018). However, these policies are often analyzed independently, despite their strong interdependence. Limited attention has been given to the interaction effects of these policies and the role of moderating factors such as fiscal policy, institutional quality, and global commodity prices. The interaction between monetary and exchange rate

policies can produce reinforcing or offsetting effects on trade balance. For instance, tight monetary policy may attract capital inflows and appreciate the exchange rate, thereby reducing export competitiveness, while expansionary policy may generate inflationary pressures with similar adverse effects. The absence of effective policy coordination, alongside structural constraints, has limited the effectiveness of these instruments in addressing Nigeria's persistent trade imbalance. Against this backdrop, this study provides a comprehensive empirical analysis of the interaction effects of monetary and exchange rate policies on Nigeria's trade balance, with a specific focus on oil and non-oil sectors, as well as capital and consumer goods. Using annual data from 1981 to 2023 and employing the Autoregressive Distributed Lag (ARDL) framework, the study examines both short- and long-run dynamics. By adopting a disaggregated approach, the study contributes to the literature by offering deeper insights into the sectoral transmission mechanisms of macroeconomic policies. The findings are expected to inform policymakers, particularly the Central Bank of Nigeria, on the need for coordinated policy frameworks to enhance external sector performance, promote non-oil exports, and achieve sustainable trade balance outcomes.

2.0 Theoretical and Empirical Literature Review

2.1 Theoretical literature review

Trade balance, also known as the balance of trade (BOT), refers to the difference between the monetary value of a country's exports and imports over a given period (Tarawalie & Kpana, 2022; Kenton & Boyle, 2021). A positive trade balance indicates a surplus where exports exceed imports, while a negative balance reflects a deficit when imports are greater than exports (Kenton, Boyle, & Perez, 2022). As a key component of the balance of payments, the trade balance serves as an important indicator of a country's economic performance and external stability. Persistent trade deficits may imply reliance on foreign goods and borrowing from surplus countries, whereas surpluses suggest stronger export demand and the ability to lend internationally (Srivastav & Vaidya, 2023). Overall, trade balance plays a vital role in economic growth and development, with surplus and deficit positions reflecting the net outcome of a country's trade activities (Adeyemi, Oseni & Tella, 2020).

Monetary policy refers to the use of instruments such as interest rates, reserve requirements, and open market operations by the central bank to regulate money supply, control inflation, and influence economic activity (Mishkin, 2007). In Nigeria, the Central Bank of Nigeria implements monetary policy, which affects the balance of trade through its impact on aggregate demand, particularly by influencing import demand via

interest rate adjustments (Taylor, 1993; Friedman, 1968). Exchange rate policy, on the other hand, involves managing the value of a country's currency and can operate under fixed, floating, or managed regimes, with significant implications for trade competitiveness (Mundell, 1961; Marshall & Lerner, 1944). Although currency depreciation is expected to boost exports and reduce imports, Nigeria's high import dependence limits this effect (Adeniran et al., 2014). Overall, both monetary and exchange rate policies are critical macroeconomic tools that directly and indirectly shape Nigeria's balance of trade.

Structuralist trade theory, proposed by Prebisch and Singer, asserts that trade imbalances in developing countries like Nigeria arise from deep-rooted structural issues such as a narrow export base and institutional weaknesses. Unlike traditional models, it argues that monetary policies are inadequate for addressing trade deficits; instead, long-term solutions require structural transformation, including export diversification and governance reforms. This perspective highlights the limitations of relying solely on macroeconomic tools without tackling underlying structural challenges.

Keynesian monetary policy, rooted in John Maynard Keynes's General Theory of Employment, Interest, and Money (1936), emphasizes the importance of aggregate demand in influencing economic output and employment, especially during recessions. It advocates for central banks, like the Federal Reserve, to use monetary tools—such as interest rate adjustments—to stabilize the economy. Keynes argued that insufficient aggregate demand leads to recessions, increased unemployment, and reduced output. By lowering interest rates, borrowing becomes cheaper, stimulating investment and consumption; conversely, raising rates can help control inflation during economic growth. Keynes' liquidity preference theory asserts that individuals prefer liquid assets for safety and convenience, driven by three motives: transactions for daily expenses, precautionary needs, and speculative opportunities from interest rate fluctuations. Central banks can influence interest rates through open market operations, affecting banking liquidity and the economy. A notable concept is the liquidity trap, where low interest rates fail to stimulate demand as individuals choose to hoard money instead of investing or spending, often occurring during periods of uncertainty, like the Great Depression and post-2008 crisis.

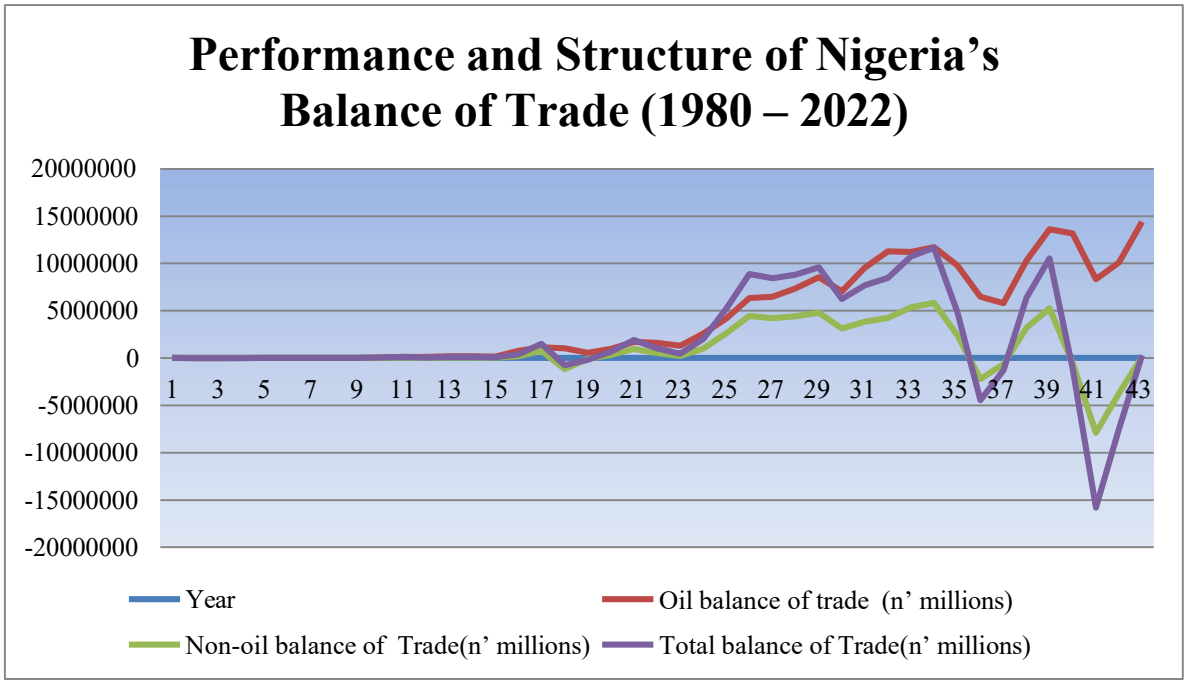
The monetary approach to the balance of payments (MABP), established by Johnson (1972) and refined by Frenkel and Johnson (1976), views trade imbalances as primarily monetary. A balance of payments deficit arises when domestic money supply exceeds demand, leading to increased spending on foreign goods and trade deficits. In Nigeria, monetary expansion linked to government borrowing often results in higher import bills and declining trade performance, while contractionary policies may improve the trade balance. However,

the theory assumes perfect capital mobility and overlooks the complexities of exchange rate management and informal financial systems in developing economies. The Purchasing Power Parity (PPP) theory, rooted in the 16th century but modernized by Gustav Cassel in 1918, explains exchange rates and price levels across countries, addressing currency misalignments from inflation differentials.

2.2 Stylised Facts on the Performance and Structure of Nigeria's Trade Balance

Figure 1.2 shows the value of balance of trade on oil and non-oil and the total balance of trade in Nigeria (1980-2022).

Figure 1.2: Performance and Structure of Nigeria's Balance of Trade (1980 – 2022).



Source: (Author Computation 2023)

The table below shows the value of balance of trade on Oil and Non-Oil in Millions and the Total Balance of trade in Nigeria

Table 1.1: Performance and Structure of Nigeria's Balance of Trade (1980 – 2022).

Year	Oil balance of trade (n' millions)	Non-oil balance of Trade(n' millions)	Total balance of Trade(n' millions)
1980	13,404.9	-8,313.8	5,091.10
1981	10,560.70	-12,377.00	-1,816.30

1982	7,777.70	-10,341.80	-2,564.10
1983	7,029.60	-8,430.80	-1,401.20
1984	8,558.20	-6,648.50	1,909.70
1985	11,171.90	-6,513.70	4,658.20
1986	7,454.60	-4,517.60	2,937.00
1987	25,038.50	-12,539.60	12,498.90
1988	24,632.30	-14,885.20	9,747.10
1989	50,345.20	-23,234.20	27,111.00
1990	100,553.40	-36,385.20	64,168.20
1991	109,085.90	-77,038.70	32,047.20
1992	181,822.40	-119,361.90	62,460.50
1993	172,642.70	-119,502.00	53,140.70
1994	158,360.60	-115,090.20	43,270.40
1995	771,739.40	-576,205.70	195,533.70
1996	1,124,037.20	-377,120.40	746,916.80
1997	1,045,596.90	-2,205,272.00	395,946.10
1998	541,932.30	-627,494.30	-85,562.00
1999	957,815.10	-631,361.00	326,454.10
2000	1,700,082.71	-739,381.80	960,700.91
2001	1,602,838.42	-1,093,064.90	509,773.52
2002	1,287,735.83	-1,056,253.48	231,482.35
2003	2,594,187.64	-1,586,536.52	1,007,651.12
2004	4,171,357.47	-1,555,621.20	2,615,736.27
2005	6,343,279.98	-1,897,601.51	4,445,678.47
2006	6,480,402.64	-2,264,241.33	4,216,161.31
2007	7,342,273.54	-2,944,467.85	4,397,805.69
2008	8,546,302.89	-3,751,789.72	4,794,513.17
2009	7,036,710.19	-3,911,046.60	3,125,663.59
2010	9,543,381.72	-5,695,880.42	3,847,501.30
2011	11,279,557.93	-7,038,755.57	4,240,802.36
2012	11,195,734.98	-5,822,965.58	5,372,769.40

2013	11,702,466.98	-5,879,878.08	5,822,588.90
2014	9,791,799.02	-7,368,686.69	2,423,112.33
2015	6,459,255.60	-8,690,165.13	-2,230,909.53
2016	5,794,405.49	-6,439,160.45	-644,754.96
2017	10,297,787.00	-7,114,489.65	3,183,297.35
2018	13,595,775.20	-8,333,560.51	5,262,214.68
2019	13,168,643.82	-13,708,078.40	-539,434.58
2020	8,341,141.57	-16,246,741.02	-7,905,599.45
2021	10,089,157.29	-13,839,821.94	-3,750,664.65
2022	14,375,236.87	-14,238,773.06	136463.8097

Source: Central Bank of Nigeria Statistical Bulletin, 2022.

The Iranian revolution caused oil prices to surge and the Nigerian economy benefited maximally. This was the second oil price shock in Nigeria between 1979 and 1981. Consequently, oil trade balance of trade in 1980 and 1981 stood at N13, 404.9 million and N10, 560.70 million respectively. The period 1990 to 1992 was the Gulf War oil boom occasioned by the Gulf War between the United States and its Allied Force and Iraq. Oil prices increased during the Gulf War and the Nigerian economy benefited from increased oil revenues which was reflected in the surge in the oil trade balance between 1990 and 1992. The pre-financial crisis oil boom occurred between 2003 and 2008 due to high global demand for oil which caused rapid increase in oil prices. Because of the high oil price increase. The economy benefited leading to a surge in Nigeria's oil trade balance between 2003 and 2008. Furthermore, there was Post-financial crisis oil boom between 2010 and 2014. Global economic recovery drove oil demand thus, oil prices remained relatively high. This era was demonstrated with increases in Nigeria's oil trade balance between 2010 and 2014. Finally, the Post-Pandemic oil boom occurred between 2020 and 2022 due to the global economic recovery from COVID-19 pandemic which led to oil price surge. Between 2020 and 2022, the Nigeria's oil trade balance stood at ₦8, 341.57 million, N10, 089, 157.20 million and ₦14, 375, 236. 87 million respectively.

Unfortunately, the negative trend of Nigeria's non-oil trade balance over the years made the country's total trade balance to turn out to be negative in the years, 1981, 1982, 1983, 1998, 2015, 2016, 2019, 2020 and 2021 respectively. It is noteworthy that the country's negative total trade balance was attributed to the impacts of COVID-19 and the post-COVID-19 effect of the pandemic.

2.3 Empirical literature review

Empirical studies on the relationship between monetary policy, exchange rate policy, and trade balance have produced mixed and often inconclusive results, particularly in developing economies such as Nigeria. This inconsistency reflects differences in methodologies, variable selection, time periods, and country-specific structural characteristics.

Nwagu, Uzonwanne, and Ezenekwe (2024) examined the impact of monetary policy rate on Nigeria's trade balance using the ARDL approach and found that the monetary policy rate is insignificant in the short run but significant in the long run. While informative, the study is limited by its narrow focus on a single monetary policy instrument, thereby ignoring other transmission channels such as money supply and exchange rate dynamics. Similarly, Yakubu, Ebeh, and Ajayi (2022) reported that monetary policy variables negatively affect the balance of payments, but their focus on aggregate balance of payments, rather than disaggregated trade balance components, limits the policy relevance of their findings.

Nwagu et al. (2022), using OLS and co-integration techniques, concluded that monetary and fiscal policies do not significantly improve Nigeria's trade balance. However, their reliance on OLS may not adequately capture dynamic relationships and short- and long-run interactions, thereby raising concerns about model robustness. In contrast, exchange rate-focused studies such as Kofoworade (2023) and Ijirshar et al. (2022) provide more nuanced insights, with findings suggesting both negative short-run and positive long-run effects of exchange rate depreciation on trade balance. While these studies support the J-curve hypothesis, they largely treat exchange rate in isolation without considering its interaction with monetary policy.

Cross-country evidence further highlights contextual differences. Tarawalie and Kpana (2022) found that money supply and exchange rate negatively affect trade balance in Sierra Leone, while Anh, Tuyet, and Linh (2022) reported a positive relationship between exchange rate depreciation and trade balance in Vietnam. Truong and Vo (2023) also demonstrate that exchange rate effects can be asymmetric, yet their nonlinear approach is rarely replicated in Nigerian studies.

Overall, existing literature suffers from three major gaps. First, most studies examine monetary and exchange rate policies in isolation, neglecting their interaction effects on trade balance. Second, many studies rely on aggregated trade balance, failing to disaggregate oil and non-oil sectors as well as capital and consumer goods. Third, there is limited use of recent data and comprehensive modeling approaches capable of capturing both short- and long-run dynamics.

This study addresses these gaps by examining the interaction effects of monetary and exchange rate policies on Nigeria's trade balance using updated data (1981–2023) and the ARDL framework, with sectoral disaggregation and inclusion of moderating variables. This study is therefore justified on several grounds. It fills a major empirical gap by jointly modeling the interaction between monetary and exchange rate policies rather than treating them as isolated instruments. By incorporating sectoral disaggregation and additional moderating variables, the study offers a stronger empirical basis for designing coherent and effective trade-related macroeconomic policies in Nigeria.

3.0 Research Methodology

This study employs a hybrid framework of macroeconomic theories to examine the interaction effect of monetary and exchange rate policies on Oil and Non-oil trade balance in Nigeria.

Interaction Effect (Oil Sector)

$$OTB = f(MPR, REXR, (MPR * REXR), INTR, CPI, COP, FISCAL, INSTQ) \quad 1$$

Where OTB = Oil trade balance, MPR = Monetary policy rate, REXR = Real exchange rate, INT = Interest rate, CPI = Commodity price index, COP = Crude oil price, FISCAL = Budget balance % of GDP. INST = Institutional quality (Control of Corruption)

The ARDL model of equation 1 in econometric form is stated in equation 2

$$\begin{aligned} OTB_t = {} & \alpha_0 + \sum_{t=i}^{p} \alpha_{1i} \Delta OTB_{t-1} + \sum_{t=i}^{p} \alpha_{2i} \Delta MPR_{t-1} + \sum_{t=i}^{p} \alpha_{3i} \Delta REXR_{t-1} + \sum_{t=i}^{p} \alpha_{4i} (MPR_t * REXR_t) + \\ & \sum_{t=i}^{p} \alpha_{5i} \Delta INT_{t-1} + \sum_{t=i}^{p} \alpha_{6i} \Delta COP_{t-1} + \sum_{t=i}^{p} \alpha_{7i} \Delta CPI_{t-1} + \sum_{t=i}^{p} \alpha_{8i} \Delta FISCAL_{t-1} + \\ & \sum_{t=i}^{p} \alpha_{9i} \Delta INST_{t-1} + \beta_1 OTB_{t-1} + \beta_2 MPR_{t-1} + \beta_3 REXR_{t-1} + \beta_4 INT_{t-1} + \beta_5 COP_{t-1} \\ & + \beta_6 CPI_{t-1} + \beta_7 FISCAL_{t-1} + \beta_8 INST_{t-1} + \varepsilon_t \end{aligned} \quad 2$$

Interaction Effect (Non-Oil Sector)

$$NOTB = f(MPR, REXR, (MPR * REXR), INTR, CPI, COP, FISCAL, INSTQ) \quad 3$$

Where NOTB = Oil trade balance, MPR = Monetary policy rate, REXR = Real exchange rate, INT = Interest rate, CPI = Commodity price index, COP = Crude oil price, FISCAL = Budget balance % of GDP. INST =

Institutional quality (Control of Corruption)

The ARDL model of equation 3 in econometric form is stated in equation 4

$$\begin{aligned} NOTB_t &= \alpha_0 + \sum_{t=i}^{p} \alpha_{1i} \Delta NOTB_{t-1} + \sum_{t=i}^{p} \alpha_{2i} \Delta MPR_{t-1} + \sum_{t=i}^{p} \alpha_{3i} \Delta REXR_{t-1} + \sum_{t=i}^{p} \alpha_{4i} (MPR_t * REXR_t) + \\ &\sum_{t=i}^{p} \alpha_{5i} \Delta INT_{t-1} + \sum_{t=i}^{p} \alpha_{6i} \Delta COP_{t-1} + \sum_{t=i}^{p} \alpha_{7i} \Delta CPI_{t-1} + \sum_{t=i}^{p} \alpha_{8i} \Delta FISCAL_{t-1} + \\ &\sum_{t=i}^{p} \alpha_{9i} \Delta INST_{t-1} + \beta_1 NOTB_{t-1} + \beta_2 MPR_{t-1} + \beta_3 REXR_{t-1} + \beta_4 INT_{t-1} + \beta_5 COP_{t-1} \\ &+ \beta_6 CPI_{t-1} + \beta_7 FISCAL_{t-1} + \beta_8 INST_{t-1} + \varepsilon_t \end{aligned} \quad 4$$

Model justification

ARDL combines I(0) and I(1) data with a single equation, allowing flexible lag-length allocation. Monte Carlo results suggest ARDL outperforms Engle and Granger (1987), Johansen and Juselius (1990), and Phillips and Hansen (1990) in small samples, while also addressing endogeneity issues.

4. RESULTS AND DISCUSSION OF FINDINGS

4.1: Oil Trade Balance

Table1: Short run estimate

Dependent Variable: D(OTB)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
D(OTB(-1))	-0.310499	0.109797	-2.827943	0.0107
D(OTB(-2))	-0.124970	0.077816	-1.605978	0.1248
D(OTB(-3))	-0.798630	0.102713	-7.775347	0.0000
D(MPR)	124579.8	47870.17	2.602452	0.0175
D(MPR(-1))	-1364.689	49960.22	-0.027316	0.9785
D(MPR(-2))	461459.1	52158.78	8.847200	0.0000
INTR	-979.5127	10049.28	-0.097471	0.9234
D(REXR)	-4933.254	6480.208	-0.761280	0.4558
D(COP)	59540.89	6069.574	9.809732	0.0000
D(COP(-1))	52390.81	8877.485	5.901538	0.0000
D(COP(-2))	13221.81	8451.675	1.564401	0.1342

D(FISCAL)	-990.3531	383.1236	-2.584944	0.0182
D(FISCAL(-1))	-622.5075	378.9663	-1.642646	0.1169
D(FISCAL(-2))	-1163.003	394.2025	-2.950267	0.0082
D(FISCAL(-3))	2165.708	471.6497	4.591773	0.0002
D(INTS)	-285639.8	294830.3	-0.968828	0.3448
D(INTS(-1))	-746252.2	431219.8	-1.730561	0.0997
D(INTS(-2))	-1082899.	420209.2	-2.577048	0.0185
D(INTS(-3))	-640694.4	292404.8	-2.191121	0.0411
C	103559.6	128308.6	0.807114	0.4296

R-squared	0.962906	Mean dependent var	478275.9
Adjusted R-squared	0.925813	S.D. dependent var	1815746.
S.E. of regression	494560.8	Akaike info criterion	29.36725
Sum squared resid	4.65E+12	Schwarz criterion	30.22035
Log likelihood	-552.6613	Hannan-Quinn criter.	29.67333
F-statistic	25.95881	Durbin-Watson stat	2.070154
Prob(F-statistic)	0.000000		

Source: Estimation by the Researcher by Using E-views 10

Table 1 indicates that the first and third lags of balance of trade on oil goods, fiscal policy stance, and certain lags of institutional quality negatively impact Nigeria's oil trade balance, decreasing it by 0.31 to 64.1 units. Conversely, specific lags of monetary policy and crude oil prices positively affect the trade balance, increasing it by 12.4 to 59.5 units. The adjusted R-square of 0.925813 (93%) shows strong model reliability.

Error Correction Model (Long Run Estimation)

Table 2: Summary of the Error Correction model

ECM Regression

Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(OTB(-1), 2)	0.923601	0.070819	13.04165	0.0000

D(OTB(-2), 2)	0.798630	0.069168	11.54619	0.0000
D(MPR, 2)	124579.8	30599.11	4.071354	0.0007
D(MPR(-1), 2)	-461459.1	34462.02	-13.39037	0.0000
D(COP, 2)	59540.89	3581.381	16.62512	0.0000
D(COP(-1), 2)	-13221.81	4211.410	-3.139520	0.0054
D(FISCAL, 2)	-990.3531	189.6030	-5.223299	0.0000
D(FISCAL(-1), 2)	-1002.706	208.1345	-4.817584	0.0001
D(FISCAL(-2), 2)	-2165.708	259.6757	-8.340050	0.0000
D(INTS, 2)	-285639.8	195721.6	-1.459419	0.1608
D(INTS(-1), 2)	1723594.	316441.1	5.446807	0.0000
D(INTS(-2), 2)	640694.4	191903.5	3.338628	0.0035
CointEq(-1)*	-2.234099	0.133717	-16.70773	0.0000

R-squared	0.971617	Mean dependent var	109860.3
Adjusted R-squared	0.958516	S.D. dependent var	2075735.
S.E. of regression	422775.5	Akaike info criterion	29.00827
Sum squared resid	4.65E+12	Schwarz criterion	29.56279
Log likelihood	-552.6613	Hannan-Quinn criter.	29.20723
Durbin-Watson stat	2.070154		

* p-value incompatible with t-Bounds distribution.

In the ECM regression (Table 2), adjusted R-square guided model selection, leading to the omission of some variables. The significant negative coefficient (-16.70773) indicates a long-run relationship among trade balance in oil goods, monetary policy rate, and interest rates.

Table3: Wald Test

Wald Test:

Equation: Untitled

Test Statistic	Value	Df	Probability
F-statistic	21.02783	(8, 19)	0.0000
Chi-square	168.2226	8	0.0000

Table 3 presents the Wald test, which evaluates the long-term impact of independent variables on Nigeria's trade balance. The null hypothesis (H0) suggests that monetary policy and interest rates do not significantly affect the trade balance, while the alternative hypothesis (H1) posits that they do. The Wald test yields an F-statistic of 21.02783 and a p-value of 0.0000. Since the p-value is below 0.05, we reject H0, concluding that monetary and interest rate policies significantly influence Nigeria's trade balance in oil goods.

Breuch-Godfrey Serial Correlation LM Test

Table 4.

F-statistic	1.209201	Prob. F(2,17)	0.3229
Obs*R-squared	4.857129	Prob. Chi-Square(2)	0.0882

Source: Estimation by the Researcher by Using E-view 10

The F-statistic of 1.209201 and a p-value of 0.3229 indicate that we cannot reject the null hypothesis of no correlation, suggesting the model is free from serial correlation.

Heteroskedasticity test

Table 5: Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.291340	Prob. F(19,19)	0.9950
Obs*R-squared	8.798804	Prob. Chi-Square(19)	0.9767
Scaled explained SS	3.101090	Prob. Chi-Square(19)	1.0000

Source: Estimation by the Researcher by Using E-views 10

The Breusch-Pagan test in Table 5 indicates heteroskedasticity, rejecting the null hypothesis of homoskedasticity with an F-statistic of 0.291340 and a p-value of 0.9950.

Fig 2.2: Stability test

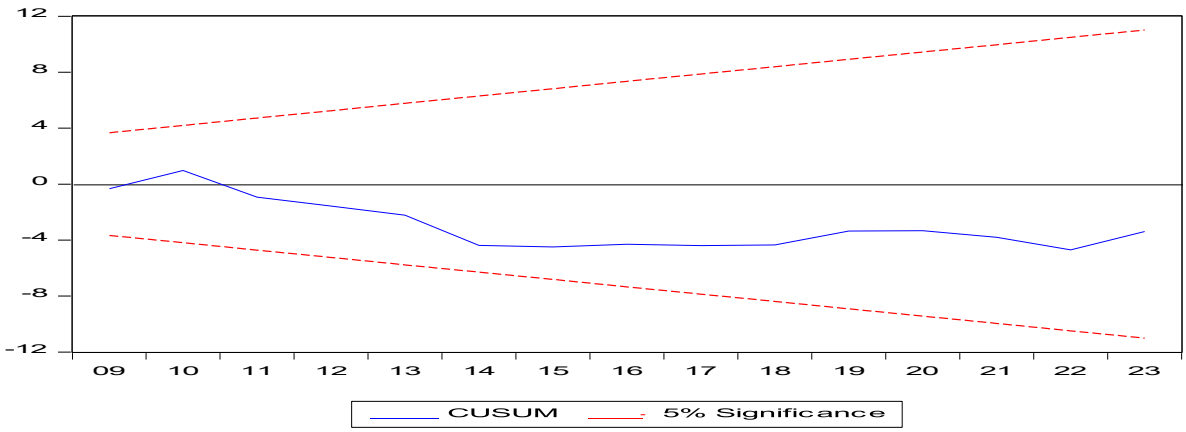


Fig 2 Shows the blue line within the 5% significance boundary, indicatingmodel stability.

4.2 : Non- Oil Trade Balance

Table 6: Short-run estimate

Dependent Variable: D(NOTB)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
D(NOTB(-1))	0.365211	0.169098	2.159760	0.0431
D(NOTB(-2))	-0.702006	0.135162	-5.193800	0.0000
D(NOTB(-3))	-0.464858	0.157299	-2.955246	0.0078
D(MPR)	-1653.458	54999.29	-0.030063	0.9763
D(MPR(-1))	40105.95	53047.33	0.756041	0.4584
D(MPR(-2))	-69008.19	63487.35	-1.086960	0.2900
D(MPR(-3))	-163468.7	59352.93	-2.754180	0.0122
INTR	-3698.825	20208.51	-0.183033	0.8566
D(REXR)	19537.16	6967.788	2.803925	0.0110
CPI	6200.052	10288.22	0.602636	0.5535
D(COP)	-15925.65	7698.304	-2.068722	0.0517
D(COP(-1))	-28691.29	8197.292	-3.500094	0.0023
D(COP(-2))	14965.20	9744.141	1.535815	0.1403
D(COP(-3))	-10975.14	8721.298	-1.258430	0.2227

D(FISCAL)	1699.207	349.7721	4.858040	0.0001
D(FISCAL(-1))	-591.1839	607.7586	-0.972728	0.3423
D(FISCAL(-2))	1178.189	562.7485	2.093633	0.0492
D(INTS)	-224894.0	180530.1	-1.245742	0.2273
C	-408427.1	290650.5	-1.405217	0.1753
R-squared	0.891066	Mean dependent var		-375155.8
Adjusted R-squared	0.793025	S.D. dependent var		1208932.
S.E. of regression	549997.0	Akaike info criterion		29.57974
Sum squared resid	6.05E+12	Schwarz criterion		30.39020
Log likelihood	-557.8050	Hannan-Quinn criter.		29.87053
F-statistic	9.088748	Durbin-Watson stat		2.209779
Prob(F-statistic)	0.000004			

Source: Estimation by the Researcher by Using E-views 10

Table 6 indicates that the second and third lags of non-oil trade balance, third lag of monetary policy rate, and crude oil prices negatively impact Nigeria's non-oil trade balance, reducing it by 0.70, 0.46, 16.3, 15.9, and 28.7 units, respectively. In contrast, the first lag of non-oil trade balance, real exchange rate, and fiscal policy stance positively influence it, increasing it by 0.37, 19.53, 17.0, and 11.8 units, respectively. The adjusted R-squared value of 0.793025 (80%) indicates strong model reliability.

Error Correction Model (Long Run Estimate)

Table 7: Summary of the Error Correction model

Dependent Variable: D(NOTB)

ECM Regression

Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(NOTB(-1), 2)	1.166864	0.129640	9.000817	0.0000
D(NOTB(-2), 2)	0.464858	0.127474	3.646679	0.0016
D(MPR, 2)	-1653.458	32321.84	-0.051156	0.9597
D(MPR(-1), 2)	232476.8	37433.59	6.210380	0.0000
D(MPR(-2), 2)	163468.7	37862.86	4.317388	0.0003

D(COP, 2)	-15925.65	4818.467	-3.305128	0.0035
D(COP(-1), 2)	-3990.058	7104.181	-0.561649	0.5806
D(COP(-2), 2)	10975.14	5256.648	2.087859	0.0498
D(FISCAL, 2)	1699.207	232.9380	7.294675	0.0000
D(FISCAL(-1), 2)	-1178.189	267.4986	-4.404468	0.0003
CointEq(-1)*	-1.801653	0.197275	-9.132715	0.0000

R-squared	0.936210	Mean dependent var	-10275.22
Adjusted R-squared	0.913428	S.D. dependent var	1579819.
S.E. of regression	464832.3	Akaike info criterion	29.16949
Sum squared resid	6.05E+12	Schwarz criterion	29.63870
Log likelihood	-557.8050	Hannan-Quinn criter.	29.33783
Durbin-Watson stat	2.209779		

In the ECM regression (Table 7), the adjusted R-square guided model selection, leading to the omission of some variables. The significant negative coefficient (-9.132715) indicates a long-run relationship between trade balance on non-oil goods, monetary policy rate, and interest rate.

Fig 2: Stability Test

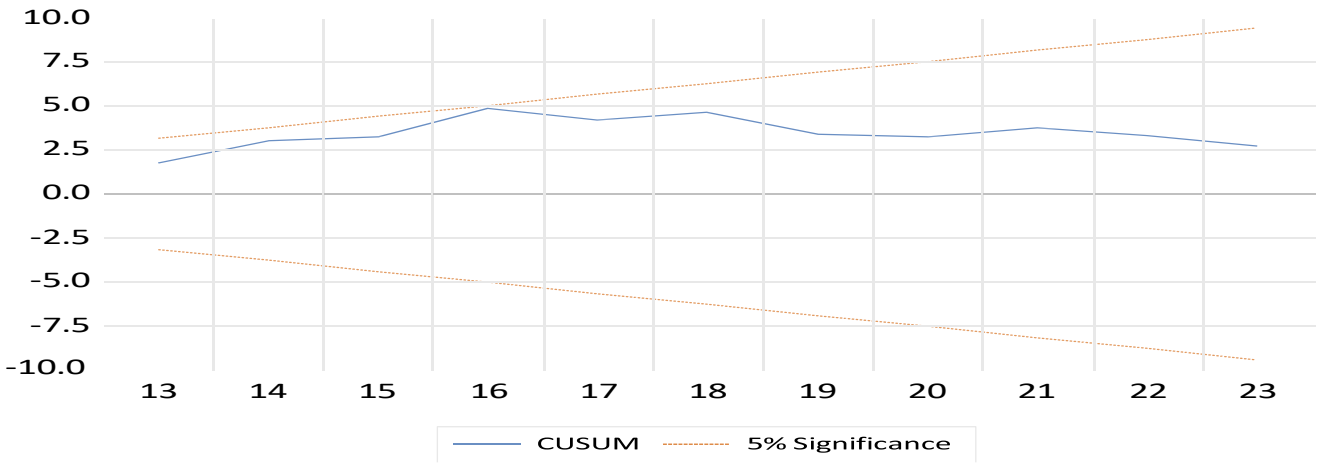


Fig 2 Shows the blue line within the 5% significance boundary, indicating model stability.

4.3 Discussion of findings

This study shows that the monetary policy rate significantly influences Nigeria's balance of trade in the long term across various sectors, including capital goods and consumer goods, but not in the oil and non-oil sectors. While short-term effects are noted for capital and consumer goods, there is no significant short-term relationship between monetary policy and trade balance in the oil and non-oil sectors, indicating a long-term correlation only. This study aligns with the findings of previous research conducted by Nwagu, Uzonwanne, &Ezenekwe (2024), Nwagu et al. (2022), Edokobi, Okpala & Okoye (2021), Sakanko and Akims (2021), Sikiru (2020), and Ogunbiyi. The Central Bank of Nigeria may adjust the monetary policy rate for commercial banks, affecting loan seekers and potentially impacting the trade balance. This rate also influences all other interest rates in the economy. Research reveals a significant long-term relationship between the real exchange rate and Nigeria's trade balance, encompassing both the oil and non-oil sectors, with notable short-term effects as well. This research is consistent with the conclusions of earlier studies, including those conducted by Kofoworade (2023), Truong and Vo (2023), Ijirshar, Okpe, &Andohol (2022), Fuard and Shifaniya (2021), Aboobucker, Kalideen, & Abdul-Jawahir (2021)

5. Conclusion and Policy Recommendations

This study analyzed the interaction effects of monetary and exchange rate policies on Oil and Non-oil trade balance in Nigeria from 1981 to 2023 using the ARDL model. It aimed to determine the statistical influence of these policies on both oil and non-oil trade balances. The findings indicate that changes in the monetary policy rate and fluctuations in the exchange rate significantly affect Nigeria's overall trade balance.

Based on the findings, the study recommends maintaining single-digit lending interest rates to enhance access to trade finance and stimulate non-oil export performance. The study recommends that the Central Bank of Nigeria implement monetary policy easing to lower interest rates and facilitate credit access for businesses, thereby enhancing competitiveness and affecting exchange rates.

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