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MONETARY POLICY RATE ON TRADE BALANCE IN NIGERIA

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Abstract

Numerous studies have examined the relationship between money supply, exchange rates, and trade balance. However, there is a lack of research in Nigeria specifically focusing on the impact of monetary policy rate on trade balance. Therefore, the objective of this study is to investigate the effect of monetary policy rate on Nigeria's trade balance. Drawing upon the absolute cost advantage theory of trade as the theoretical framework, this study utilized time series data from 1981 to 2022 and incorporated various variables such as trade balance (export-import), monetary policy rate, real exchange rates, real gross domestic product, crude oil price, interest rate, and foreign direct investment. To assess the long-term co-integration of these variables, the study employed the auto-regressive distributed lag (ARDL) model. The findings indicate that in the short run, monetary policy rate does not exert a significant influence on Nigeria's trade balance. However, in the long run, both variables demonstrate a significant impact. Consequently, the study concludes that monetary policy rate plays a crucial role in shaping the trade balance and suggests that the government should promote exports by reducing the impact of monetary policy rate, which could lead to a decrease in interest rates. This, in turn, would contribute to a surplus in the trade balance and foster economic growth within the country.

Key words: Monetary policy, Monetary policy rate, Trade balance, Nigeria, ARDL

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INTRODUCTION

A nation's trade balance represents the disparity between its exports and imports during a specific timeframe. It is also referred to as a commercial balance or a net export balance. When a country maintains a surplus trade balance, its exports surpass its imports; conversely, a deficit trade balance occurs when imports exceed exports. Historically, a favorable balance of trade was deemed crucial for a nation to fund its acquisition of foreign goods and sustain its export activities, as per the mercantilism doctrine prevalent in Europe from the 16th to the 18th centuries. To gauge the trade balance within an economy, various factors must be taken into account, such as productivity levels, foreign exchange reserves, trade policies, exchange rates, inflation rates, and foreign exchange reserves (Aderoju & Odunsi-Oyewole, 2019). There is a growing inclination among investors and policymakers to utilize

trade balances as a metric to evaluate an economy's well-being and its global interactions. Nigeria, being one of Africa's largest economies and a major oil exporter, also boasts the world's largest natural gas reserves (Salawu, Oyebayo, Obafemi, Oyeleye & Ajayi, 2022).

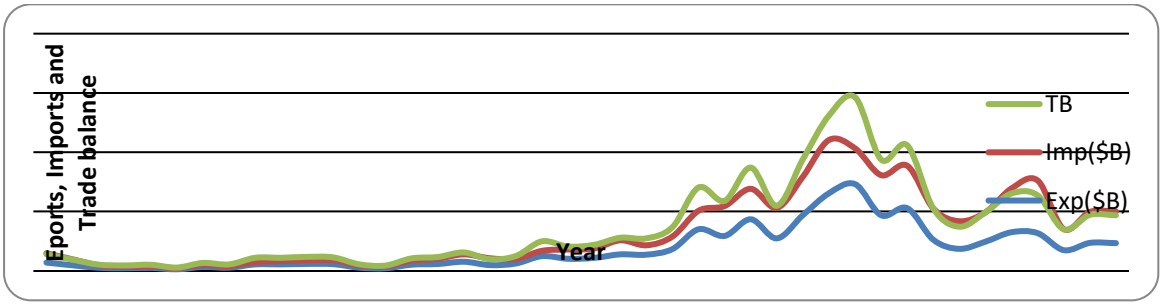
Nigeria has traded with about 100 countries worldwide since the colonial period. However, the composition of its trade has changed depending on the country. During the colonial era, Britain was Nigeria's primary trading partner; Nigeria exported 70% of its goods to Britain as late as 1955 and imported 47% (Salawu, Oyebayo, Obafemi, Oyeleye & Ajayi, 2022). In 1976, however, Britain's share of Nigerian exports and imports decreased to 38% and 32%, respectively. In recent times, Nigeria became the 39th largest partner to Britain at the end of 2023 (Trade and Investment Factsheets, 2024). Total trade in goods and services (export plus import) between Britain and Nigeria was £6.7billion in the four quarters to the end of Q2023, an increase of 2.1%, or £136 million, in current prices from the four quarters to the end of Q3 2022. UK exports of goods to Nigeria decreased by 21.2%, or £357 million, in current prices, compared to the four quarters to the end of Q3 2022 while UK exports of services to Nigeria increased by 21.3%, or £461 million, in current prices, compared to the four quarters to the end of Q3 2022. The total UK exports to Nigeria amounted to £4.0 billion, and the total UK imports were £2.7 billion, an increase of 1.2%, or £32 million, in current prices, compared to the four quarters to the end of Q3 2022 (Trade and Investment Factsheets, 2024). In 2022, the main products exported from Nigeria to Britain were Crude Petroleum ($1.33B), Refined Petroleum ($446m), and Petroleum Gas ($210 million), while exports from Britain to Nigeria were Refined petroleum ($1.87 billion), Light Pure Woven Cotton ($60.9M), and Acyclic Alcohols ($48.2 million). During the past 27 years (1995–2022), exports of Nigeria to the UK increased at an annualized rate of 8.1%, and exports of UK to Nigeria increased at an annualized rate of 4.09%.

After serving as Nigeria's primary trading partner for many years, the United States took over that role in the 1970s. It was estimated that Nigeria imported more than 14% of its imports from the United States in 1988, whereas the United States imported more than 36%. In recent times, Nigeria ranks 58th among the United States' trade partners. In 2022, trade between both countries was valued at $4.45 billion. According to NBS (2022), 6.5% of all of Nigeria's imports came from the US in the third quarter of 2022, making it Nigeria's fifth largest import partner. Major Nigerian imports from the US are wheat valued at over $173 million, used vehicles at $158 million, spare parts, machinery, refined petroleum products, and military hardware. The US was Nigeria's sixth largest export partner, with 5.7% of Nigeria's $747 million (337 billion naira) exports goes to the United States Crude oil exports

accounted for 87% of these exports, while agricultural products such as cashew nuts and frozen shrimp accounted for much of the balance (International Trade Administration, 2022). Several export preferences, like development assistance from many U.S. government agencies, were granted to Nigeria by the European Economic Community (EEC) in 1990 as part of its associate membership. Germany, France, Italy, and Spain were some of its most important trading partners within the EEC. There were also active trade relations between Nigeria and some of the members of the Organization for Economic Co-operation and Development, such as the United States, Canada, and Japan (Salawu et al., 2022)

Oil has remains the most important economic sector, even though agriculture employs nearly 70% of the workforce. In 1981, Nigerian total exports were ₦11.0 billion and total imports were ₦12.8 billion, resulting in a trade deficit of ₦1.8 billion. In 1990, total exports were ₦109.9 billion and total imports were ₦45.7 billion, resulting in a trade surplus of ₦64.2 billion. In 2000, total exports were ₦1,945.7 billion and total imports were ₦985.0, resulting in a trade surplus of ₦960.7 billion. In 2010 and 2015, the total exports were ₦12,011.5 billion and ₦8,845.2 billion, respectively, and the total imports were ₦8,166.0 billion and ₦11,076.61 billion. In 2010, a trade surplus was recorded to be ₦3,847.8 billion, and in 2015, a trade deficit was recorded to be ₦2,230.9 billion. In 2017, total exports were ₦13,988.1 and total imports were ₦8,189.4 billion, resulting in a surplus trade of ₦3.183.3 billion (CBN, 2017). According to the National Bureau of Statistics (NBS, 2021), imports of goods in Q3 2020 were higher than they had been since 2017, while exports were lower than they had been since 2017. In Q3 2020, the trade balance registered a deficit of NGN2.38 trillion as a result of lower exports and higher imports compared to Q3 2019. There has not been a merchandise trade deficit of this magnitude since 2017 in Nigeria. Nigeria's total foreign trade between January and September 2021 was N35.09 trillion, with imports coming in at ₦22 trillion and exports coming in at ₦13 trillion (NBS, 2022). As of the first quarter of 2021, Nigeria had a trade deficit of $3.94 trillion in goods. The trade deficit during the second quarter was ₦1.87 trillion as exports increased to N5.08 trillion while imports increased to N6.95 trillion. A total of N5,900.83 billion was imported by Nigeria in the first quarter of 2022, while ₦7,100.46 billion was exported, indicating that overall trade must have exceeded the amount of ₦11,707.20 billion in the fourth quarter of 2021. During the period January to March 2022, Nigeria's total trade exceeded that of the previous quarter, which was ₦11,707.20 billion, while its exports increased by 23.13 percent in comparison with October to December 2022. Hence, a total of ₦7,100.46 billion was exported, of which N115.80 billion was re-exported, while a total of ₦5,900.83 billion was imported. At the end of the fourth quarter of 2022, Nigeria’s total trade stood at N11,722.44 billion, of which total exports stood at N6,359.61 billion and total imports amounted to N5,362.83 (NBS, 2022).

Fig 1: Comparison of Import, Export and Trade Balance in Nigeria in US $Billion



Data Sources: NBS. 2022

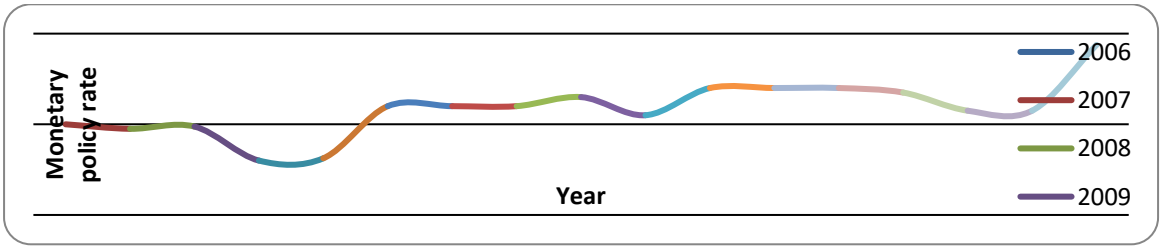
The figure above shows Nigeria Exports, Imports and trade balance activities and the volatility that occurred between these years. It can be seen that Nigeria is a country that relies heavily on imports for its economic growth. Furthermore, it can be seen that throughout the period under review (1981 to 2022), Nigeria imports more than she exports, which indicates that the country imports more than it exports. Nigeria has abandoned other sectors such as the agricultural sector, manufacturing sector, and service sector in favor of the oil sector, becoming a consuming nation rather than a producing nation and it has resulted to a negative trade balance as a result.

In their study, Nwoko, Ihemeje, and Anumadu (2016) states that monetary policy is a combination of measures that regulate the supply, value, and cost of money. Controlling the movement and direction of monetary and credit facilities is essential to maintaining stable prices and economic growth. In the same way, Aderoju & Odunsi-Oyewole, (2019) also made us to understand that monetary policy can be influenced in different ways such as monetary policy rate, exchange rate, interest rate, and inflation rate. Since monetary policy can affect an economy in the short run, governments have been able to control the internal and external balance of their countries through the short-run effects of their monetary policies.

Considering the relative ineffectiveness of the minimum rediscount rate (MRR), the Central Bank of Nigeria introduced the MPR in 2006 to replace it. In addition to setting targets and directions for other rates, the MPR has been a monetary policy tool used by the Central Bank since its adoption (Aliyu, Saidu, Zubair & Dawood, 2017), and interest rate past-through (IRPT) has been used to evaluate the effectiveness of monetary policy. An important focus of central banks is the "policy rate", which is usually a short-term thing. It is also important to note that the monetary policy rate influences expectations regarding the direction of economic activity and inflation, which affect prices of goods, asset prices, exchange rates, as well as consumption and investment. In 2006 and 2008, the MPR was

10.0 percent and 9.75%, respectively. In 2010, the MPR was 6.25 percent. This fell to 4.57 percent in 2015, and increased to 11.5 percent in 2020. In 2021 and 2022, it was 11.5 percent and 16.5 percent, respectively (CBN, 2022). A month earlier, it had raised the MPR from 11.5 percent to 13 percent. This is essentially an effort to control the 'rampaging' rate of inflation, which has risen from 15.6% in January 2022 to 18.6% in June 2022, the highest level since January 2017.

Fig 2: Monetary Policy Rate



Sources: CBN (2022)

A nation with a high and persistent trade deficit usually has a high interest rate caused by a high monetary policy rate, as opposed to one with a surplus or balanced trade balance due to a low monetary policy rate passed from the central bank to the commercial bank. An increase in interest rates tends to attract foreign investment, which in turn increases the value of the local currency in the home country (Nigeria). A low interest rate, on the other hand, tends to dissuade foreign investment and decrease the relative value of the currency. A decrease in interest rates has also been associated with an increase in net exports, affecting the foreign exchange rate in a positive manner. The domestic currency appreciates as a result of an increase in interest rates. The prices of imported goods and services are lower than those of domestic goods and services. The net export component of aggregate expenditures and demand is reduced as exports become less competitive and less profitable, imports increase, and exports decline. The key linkage between the monetary and financial sectors and aggregate demand is the change in interest rates caused by changes in monetary policy rates and exchange rates (Lioudis, Potters, and Rathburn, 2022).

Several studies have carried out monetary policy using money supply as the instrument or tool on trade balance, study such as (Bonga-Bonga, 2017; Oluyemi & Isaac, 2017; Michael & Emeka, 2017; Adeyemi & Ajibola, 2019, Oyebanji & Kleynhans, 2022; Nwagu, et al 2022) in which some found that money supply has significant effect on trade balance but this study looked at monetary policy rate as an instrument of monetary policy on trade balance (export and import) as the informative variable and not as a separated variables, both positive and negative trade balance in different years in the country

with the help of Autoregressive distributed lag (ARDL) model from 1981 to 2022. The rest of the study will follow sequentially, section two will cover the review of literature, section three looked at methods and source of data, section four covers the results and discussions and section five covers the conclusion and recommendations of the study.

Theoretical Literatures

- **Theory of Cost Advantage**

Adam Smith, a Scottish economist and philosopher, is considered the founder of modern economic theory. In 1776, he published "The Wealth of Nations," a groundbreaking book that revolutionized the understanding of international trade. Smith's theory of cost advantage challenged the prevailing mercantilist and protectionist beliefs, proposing a new framework that emphasized the benefits of free trade and specialization. He argued that countries should focus on producing goods in which they have a competitive edge, leading to increased trade and economic growth. Smith believed that specialization and division of labor were crucial factors in driving trade expansion.

Adam Smith argued that by specializing in producing goods in which they have an absolute advantage, countries can increase their productivity and output. This division of labor, facilitated by free trade, benefits both producers and consumers. Smith believed that countries should focus on producing goods they are most efficient at, regardless of their comparative advantage. Specialization allows countries to be more productive and efficient, leading to lower prices for consumers. Smith also recognized that countries with different absolute advantages can engage in mutually beneficial trade. Overall, Smith's theory emphasized the importance of free trade, specialization, and division of labor in maximizing productivity and economic growth. The study aims to promote the country's export and production of products where it has a clear advantage over other countries, and to engage in international trade in those products. The theory suggests that both countries can benefit from trade by specializing in their respective areas of advantage and trading with each other.

- **The theory of Comparative Cost Advantage**

The theory of comparative advantage, first proposed by David Ricardo in 1817, suggests that a country should focus on producing goods in which it has a lower opportunity cost compared to other countries. This specialization allows countries to export the goods in which they have the greatest benefit and import those in which they have the least benefit. Comparative advantage exists when a country can produce a commodity more efficiently than others, even if it is not the best at producing it. This theory explains why countries engage in international trade and how it can lead to economic growth and development by increasing productivity and output. The theory of comparative advantage considers both the concept of absolute advantage and cost efficiency. Absolute advantage refers to a country's

ability to produce goods or services at a lower cost than others, while comparative advantage focuses on cost efficiency. This theory has been applied in various economic contexts, such as international trade, resource allocation, and economic development. It explains why countries specialize in certain industries and the benefits of international trade. The concept of comparative advantage, developed by David Ricardo, is fundamental in economics and states that countries should specialize in producing goods in which they have a comparative advantage, leading to economic growth. Although refined over the years, this theory is still relevant in analyzing international trade and economic interactions.

This theory has greatly improved the quality of products and services, benefiting businesses by providing access to new technologies, ideas, and best practices from other countries. This, in turn, enhances competitiveness. Moreover, it leads to job creation, innovation, and increased trade between nations, ultimately contributing to economic growth. By focusing on producing goods and services with lower opportunity costs, nations or firms with comparative advantage can achieve high profit margins. Globalization has allowed less developed countries to capitalize on their comparative advantage in labor costs, making them appealing to corporations looking to reduce expenses by relocating manufacturing and labor-intensive activities there.

- **Keynesian Monetary Policy Theory**

Keynesian analysis highlights the significance of monetary policy in impacting economic activity, as discussed in the General Theory of Employment, Interest, and Money. It suggests that alterations in the money supply can have a lasting impact on variables like interest rates, aggregate demand, employment levels, output, and income. Keynes believed that the relationship between unemployment and employment is in equilibrium. Conversely, an increase in the money supply can lead to a sustained rise in output. Keynes recommended a cheap money policy during times of high unemployment to influence price levels (Nwoko, Ihemeje, and Anumadu, 2016).. The effect of the money supply on aggregate demand and output supply elasticity determines the ultimate impact on price levels. An increase in the money supply leads to an immediate decrease in interest rates. With lower interest rates, investments rise due to the marginal efficiency of capital. This increase in investments boosts effective demand, leading to higher income, output, and employment through the multiplier effect. When unemployment is present, the supply curve of factors of production is perfectly elastic, ensuring a constant rate of compensation for wage and nonwage factors of production.

Empirical Literature

A study by Mesagan, Alimi, and Vo (2022) investigated the relationship between exchange rate asymmetries, trade, and output growth in six African countries. They found that exchange rate fluctuations have a long-term impact on trade and output growth. The study revealed that both currency

appreciation and depreciation have a negative effect on the balance of trade in most African nations. However, unlike previous research that focused on exchange rates, this study specifically analyzed the impact of money supply and monetary policy rate on trade balances in Nigeria. The authors used ARDL for their analysis and provided policy recommendations based on their findings. A study conducted by Ibitoye and Ewert in 2022 investigated the impact of monetary policy, aggregate demand, and exchange rate shocks on international trade in Nigeria. They used an SVEC model to analyze the relationships between trade, interest rates, and the consumer price index in both the short and long term. The findings revealed that higher domestic prices lead to increased foreign trade, while a devaluation of the naira against the dollar decreases it. Towards the end of the study, it was observed that monetary policy shocks had a similar influence on Nigerian foreign trade forecast error variance as aggregate and exchange rate shocks. Unlike previous studies, this research also utilized the ARDL approach and included additional factors such as foreign direct investment and GDP in analyzing the trade balance. The study recommends that the government implement monetary and exchange rate policies to facilitate international trade.

Aboobucker, Kalideen, and Abdul Jawahir (2021) used ARDL modeling to analyze the relationship between Sri Lanka's exchange rate and trade balance from 1977 to 2019. Their findings suggest a positive correlation between inflation and trade balances, and a negative correlation between exchange rates and GDP. The study also found that devaluation has a gradual impact on trade balance, in line with the J-Curve phenomenon. The researchers considered factors such as money supply, monetary policy rate, and exchange rate in their analysis of trade balance. Sakanko and Akims (2021) analyzed Nigeria's trade balance from 1980 to 2018 using an Autoregressive Distributed Lag Model. They found that real interest rates and effective exchange rates have a significant negative impact on Nigeria's trade balance in both the short and long term. The study initially focused on monetary policy based on money supply but later expanded to include monetary policy rates and extended the analysis to 2021. The researchers suggest that policymakers should aim to keep interest rates low to facilitate flexible international payments. Odungweru and Ewubare (2020) examined the connection between Nigeria's exports and imports, monetary policy rate, cash reserve, and exchange rate from 1980 to 2017. The study considered various independent variables such as monetary policy rate, cash reserve ratio, exchange rate, interest rate, and inflation rate. The findings suggest that exports have a long-term relationship with these variables, particularly with the exchange rate. Imports, on the other hand, do not show a significant long-term relationship with the independent variables. Money supply is positively associated with imports, while monetary policy rates, cash reserve ratios, and inflation rates have a marginal negative impact. Interest rates and exchange rates have insignificantly positive effects. The

study focused on net exports as the dependent variable and used ARDL for estimation, including FDI and GDP in the analysis.

In their study, Wahyudi and Sari (2019) utilized a Vector Autoregression (VAR) model to analyze the changes in Indonesian exchange rates and trade balance from 1986 onwards. They focused on the variables of exchange rate (EXCRT) and net trade of goods and services (NTGS). The study also examined the impact of the J-Curve effect on the country's trade balance. The results showed that the value of net trade had minimal influence on the exchange rate. Additionally, the exchange rates were found to be significantly responsive to shocks, although not in the form of J-Curves. Instead of VAR, the study incorporated money supply, monetary policy rate, and exchange rate on net export. Najwa and Mansur (2018) studied the relationship between the Malaysian exchange rate and trade balance using ARDLs and Nonlinear ARDLs, finding short-run symmetry and long-run asymmetry. They included exports, stock prices, and money supply as control variables. Nizami, Karim, Zaidi, and Khalid (2017) examined the impact of exchange rate and monetary policy shocks on Pakistan's trade balance, using SVECM to analyze trade surpluses and deficits. They found that contractionary monetary policy shocks worsen the trade balance, supporting the role of monetary policy in expenditure switching in Pakistan.

The study by Musendami, Manuel, Shifotoka, and Nakusera (2017) analyzed the impact of Namibia's monetary policy using variables such as NFA, exchange rate, GDP, CPI, fiscal balance, interest rate, and domestic credit from 1991Q1 to 2015Q4. Results showed that NFA improved with fiscal balance but declined with domestic credit. Namibia's exchange rate did not significantly affect the balance of payments compared to GDP, interest rate, and CPI. The study used Namibian and Nigerian VECM methods to examine monetary policy and recommended using both monetary and fiscal policies to reduce domestic debt and fiscal deficits and improve the balance of payments. Eze & Atuma (2017) conducted a study on the impact of Nigeria's monetary policy on its net exports from 1981 to 2016. They used various statistical tests and found both short- and long-term relationships between variables such as money supply, interest rates, exchange rates, foreign direct investment, total exports, and total imports. The study showed that total exports had a positive, significant effect on Nigeria's net exports, while other factors had a negative and insignificant impact. The authors recommended that the government implement policies to promote export-led investment growth for improved net exports.

Contribution to Knowledge

The current research addressed the gap by revealing that the majority of previous studies concentrated on the money supply as a tool of monetary policy in relation to Nigerian trade balances and comparisons across countries. Most of these reviewed studies identified a significant positive correlation between

money supply and trade balance, while some found a negative correlation. This study thoroughly analyzed the country's trade balance, including surplus (positive) and deficit (negative) trade balances, based on specific criteria. Additionally, it utilized a different monetary policy tool, the monetary policy rate. The findings suggest that Nigeria could potentially utilize this monetary policy instrument to rectify its trade deficit in the foreseeable future. Moreover, the study employed an auto-regressive distributed lag (ARDL) bound test approach to investigate the long-term relationship and impacts among the variables under scrutiny, utilizing data spanning from 1981 to 2022.

RESEARCH METHOD

This research is founded on the concept of absolute cost advantage within its theoretical framework. The absolute cost advantage arises from the division of labor advocated by Smith in this theory. Division of labor leads to a much higher productivity per labor unit, consequently reducing the production costs. Smith also utilized the absolute advantage to elucidate the benefits of free trade in the global market. He postulated that countries can leverage their absolute advantage through exports and imports, underscoring the significance of unrestricted international trade in the global economic landscape.

Hence, defining the trade balance as

$$TB = p_x M_d^* - Q p_x^* M_d \tag{3.1}$$

The partial reduced form of the domestic trade balance (3.1), which takes into account levels of domestic exports and imports as a function of the real exchange rate, can be obtained by solving for levels of domestic exports and imports as well as relative prices of imports.

$$TB = f(Y_r, Y_r^*, Q), \frac{\partial TB}{\partial Y_r} < 0, \frac{\partial TB}{\partial Y_r^*} > 0, \frac{\partial TB}{\partial Q} > 0 \tag{3.2}$$

The Model

A significant amount of econometric analysis is conducted using autoregressive distributed lag models. In this method, autoregressive distributed lags (ARDLs) was used to identify long-term and short-term relationships between variables. The ARDL approach was used regardless of whether the variables are purely I(0) or I(1).

The general ARDL *(p q)* will be considered

$$y_t = \alpha_0 + \alpha_1 t + \sum_{i=1}^{p} \phi_i y_{t-1} + \beta' x_t + \sum_{i=0}^{q-1} \beta^{*\prime} \Delta x_{t-1} + \mu_t \tag{3.3}$$

Equation 3.2 will be formulated as follows.

$$\Delta y_t = \alpha_0 + \sum_{i=1}^{p} \alpha_i \Delta y_{t-i} + \sum_{i=0}^{p} \beta_j \Delta x_{1t-j} + \sum_{i=0}^{p} \gamma_k \Delta x_{2t-k} + \phi_0 y_{t-1} + \phi_1 x_{1t-1} + \phi_2 x_{2t-1} + \varepsilon_t \tag{3.4}$$

Where ε_t is a random disturbance term.

Model Specification

To investigate the effect of monetary policy rate on trade balance in Nigeria. Following and modifying the specification of Adelegan and Abraham (2022)

$$BOP = f(RGDP, EXR, INTR, COP, FDI) \quad (3.5)$$

With ARDL on mind, this study adopts trade balance (TB) as a function of the specified explanatory variables and modifies equation 3.18 as below.

$$TB = f(MPR, REXR, INT, COP, RGDP, FDI) \quad (3.6)$$

Where TB = Trade Balance (Export value – Import value) which can be either trade surplus, trade deficit or zero trade, MPR = Monetary Policy Rate, REXR = Real Exchange Rate, INT = Interest rate, COP = Crude Oil Price, RGDP = Real Gross Domestic Product, FDI= Foreign Direct Investment.

The data generating process for equation (3.19) and also the mathematical form is defined in econometric form in equation (3.20)

$$TB_t = \alpha_0 + \sum_{t=i}^{p} \alpha_{1i} \Delta TB_{t-1} + \sum_{t=i}^{p} \alpha_{2i} MPR_{t-1} + \sum_{t=i}^{p} \alpha_{3i} \Delta REXR_{t-1} + \sum_{t=i}^{p} \alpha_{4i} \Delta INT_{t-1} + \sum_{t=i}^{p} \alpha_{5i} \Delta COP_{t-1} + \sum_{t=i}^{p} \alpha_{6i} \Delta RGDP_{t-1} + \sum_{t=i}^{p} \alpha_{7i} \Delta FDI_{t-1} + \beta_1 TB_{t-1} + \beta_2 MPR_{t-1} + \beta_3 REXR_{t-1} + \beta_4 RINT_{t-1} + \beta_5 COP_{t-1} + \beta_6 RGDP_{t-1} + \beta_7 FDI_{t-1} + \varepsilon_t \quad (3.7)$$

Diagnostic/Estimation Techniques

Unit root test: In order to eliminate autocorrelation, Dicky and Fuller propose adding extra lagged terms to their test procedure. This equation can be used to determine the possible form of the ADF.

$$\Delta y_t = a_0 + \lambda y_{t-1} + a_{2t} + \sum_{i=1}^{p} \beta_i \Delta y_{t-1} + \mu_t \quad 3.6$$

From the stationary test, if the variables are significant, the variable series is stationary and with no unit root. As a result of the significant test, the null hypothesis will be accepted.

The Autoregressive Distributed Lag (ARDL) (Bound test): Both stationary and non-stationary time series can be modeled using ARDL models based on the ordinary least squares method (OLS). An ARDL model can be transformed into a dynamic error correction model by applying a simple linear transformation. A long-run equilibrium can also be integrated with the short-run dynamics of the ECM without affecting the long-run information.

The ARDL model is given as

$$\Delta y_t = \alpha_0 + \sum_{i=1}^{p} \alpha_i \Delta y_{t-i} + \sum_{i=0}^{p} \beta_j \Delta x_{1t-j} + \sum_{i=0}^{p} \gamma_k \Delta x_{2t-k} + \phi_0 y_{t-1} + \phi_1 x_{1t-1} + \phi_2 x_{2t-1} + \varepsilon_t \quad 3.7$$

Stability Test

The short run dynamics of the economy are important in assessing the stability of long run coefficients, according to Pesaran and Pesaran (1997). A cumulative sum of recursive residuals test (CUSUM) and a cumulative sum of recursive residuals square test (CUSUMSQ) were proposed by Broen et al (1975).

RESULTS AND DISCUSSION OF FINDING

Table I: Unit root test
Summary statistics for unit root test

		ADF Test Statistics			
Variables	Test critical value @5%	Level diff	First Diff	Probability	Order of Integration
TB	-3.529758	-3.547635*	-10.27052**	0.0000	I(1)
MPR	-3.529758	2.418282*	6.645161**	0.0000	I(1)
REXR	-3.529758	0.068481*	-4.776618**	0.0023	I(1)
INT	-3.523623	-7.623321**		0.0000	I(0)
GDP	-3.529758	-2.289387*	-3.538102	0.0491	I(1)
COP	-3.529758	-2.658792	-6.908565	0.0000	I(1)
FDI	-3.529758	-2.215228	-7.158241	0.0000	I(1)

Source: Estimated by the Researcher Using E-view 10

The null hypothesis (H_0) is that there is present of unit root meaning that the variables are not stationary while the alternative hypothesis (Ha) is that there is no unit root, meaning that the variables are stationary. From the above table using Augmented Dickey Fuller (ADF) to test for unit root, only interest rate (INR) is seen to be integrated of order zero I(0) while other variables such as trade balance (TB), broad money supply (MS2), monetary policy rate (MPR), real exchange rate (REXR), gross domestic product (GDP), crude oil price (COP) and foreign direct investment (FDI) are all integrated of order one I(1). The variables are integrated of I(0) and I(1), as a result of these we can proceed by using our model which is the Auto-regressive distributive lag (ARDL) model.

Co-integration Test – ARDL Bound Test

To investigate the effect of monetary policy rate on trade balance in Nigeria. Co-integration test (Bound Testing Approach) for Long-run Relationship

Table 2

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	6.467762	10%	1.99	2.94

K	6	5%	2.27	3.28
		2.5%	2.55	3.61
		1%	2.88	3.99
Actual Sample Size	38		Finite Sample: n=40	
		10%	2.218	3.314
		5%	2.618	3.863
		1%	3.505	5.121
			Finite Sample: n=35	
		10%	2.254	3.388
		5%	2.685	3.96
		1%	3.713	5.326

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

Table 2 show the bound test approach for long-run relationship. Monetary policy (Monetary policy rate) (MPR) = trade balance (TB) = 0 to estimate the long run with trade balance. The estimated result can reject the null hypothesis if the F statistics is larger than the upper bound of 5% Peasaran critical value. In this situation, F-statistics shows the value of 6.467762 and the 5% critical value in Peasaran et al (1999) table shows the lower bound as 2.27 and upper bound as 3.28. The F-statistics exceeded the upper bound value that is why the nominal hypothesis (H_0) does not accept and accept the unconventional hypothesis (H_1). So the variables have long run relationship. Since there is a long-run relationship among the variables we estimate both the short run model and the long run model (the error correction model (ECM).

Table 3 Error Correction Model (Long Run Estimation)
Summary of the Error Correction model
Dependent Variable: D(TB)

ECM Regression				
Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(TB(-1))	0.693644	0.205582	3.374049	0.0025
D(TB(-2))	0.431597	0.120420	3.584102	0.0015
D(MPR)	0.375778	1.126636	0.333540	0.7416
D(MPR(-1))	2.686911	1.123983	2.390526	0.0250
D(COP)	-0.894721	0.128732	-6.950241	0.0000
D(COP(-1))	-1.066998	0.202942	-5.257660	0.0000
CointEq(-1)*	-2.551270	0.312075	-8.175178	0.0000

R-squared	0.871891	Mean dependent var		1.227368
Adjusted R-squared	0.847096	S.D. dependent var		31.08801
S.E. of regression	12.15634	Akaike info criterion		7.998400
Sum squared resid	4581.073	Schwarz criterion		8.300061
Log likelihood	-144.9696	Hannan-Quinn criter.		8.105729
Durbin-Watson stat	2.109554			

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

In the ECM regression estimation above in table 3 the adjusted R-square was also selected in the model selection criteria. This adjusted R-square criteria penalizes the R^2 of the addition of the regressors or independent variables which does not contributed to the explanatory power of the model. That is why some independents variables are also missing in the estimation. The error correction model is seen to be negative and significant (-8.175178), also indicating that there is a long-run relationship between trade balance and monetary policy rate and other independent variables.

Table 4: Wald Test

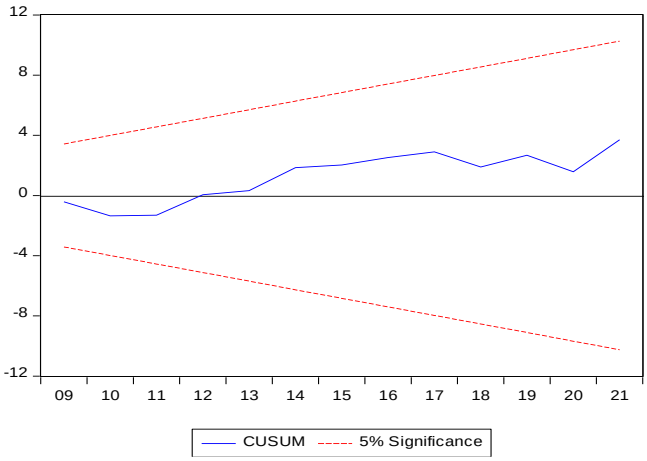
Wald Test:			
Equation: Untitled			
Test Statistic	Value	df	Probability
F-statistic	3.755918	(2, 24)	0.0381
Chi-square	7.511835	2	0.0234

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

Table 4 estimated the Wald test. The Wald test is used to ascertain whether the joint impact of the independent variables actually have a significant influence on the dependent variable in the long run. From the research hypothesis in objective one, the null (H_0) state that monetary policy rate has no significant effect on Nigeria's trade balance and the alternative (H_1) state that monetary policy rate has a significant effect on Nigeria's trade balance. From the result of the Wald test above, the value of the F-statistics is 3.755918 and probability value is 0.0381. Comparing the probability level with the significant level of 5% (0.05), we discover that it less that 0.05 making it statically significant and as such we reject the null hypothesis. We therefore conclude that monetary policy (monetary policy rate) has a significant effect on Nigeria's trade balance. The result indicates that effect on trade balance can be either positive or negative base on the increases or decreases of monetary policy rate by the central bank of Nigeria to the commercial banks down to the individuals/customers that need loans for international trade.

Stability Test

Fig 1



From fig 1 above we can see that the blue line lies between the 5% significant boundary so we can say the model is stable.

Discussion/Policy Implications

The findings of this study show that monetary policy rate has a long run relationship effect on trade balance. It clearly indicates that monetary policy rate is a tool of monetary policy that can be use in controlling international trade (export and import) in the Country. Though in the short run, it was reported that, monetary policy rate has no statically significant effect on trade balance, but in the long, there is a relationship or correlation between monetary policy rate and trade balance in Nigeria. This study conform to studies such as Odungweru and Ewubare (2020), Aboobucker, Kalideen and Abdul Jawahir (2021), Eze and Atuma (2017), Sakanko and Akims (2021) and Najwa and Mausur (2018). Secondly, it is also good to mention that The central bank of Nigeria may decide in the long run to increase or decrease the monetary policy rate for commercial banks, which may also have an impact on customers or investors who seek loans or collect loans from the bank, which may result in a positive or negative impact on the trade balance. All other interest rates within an economy are based on the monetary policy rate, which is the baseline interest rate. Yusuf (2023) asserts that increasing the MPR will increase the cost of credit and result in an additional burden on trade and businesses. As a result of an increase in the MPR, it will become more expensive to borrow money for investment, therefore increasing the cost of goods and services, slowing down trade, and affecting economic growth. Increasing the MPR will result in high interest rates, increased international trade costs, which will result in higher import prices, resulting in the country shifting away from imports.

Conclusion and Policy Recommendations

In this study, the effect of monetary policy rate on the trade balance in Nigeria was empirically examined through the use of the ARDL model between 1981 and 2022. The purpose of this study was to answer the following three research questions, whether (or not) monetary policy rate has a significant effect on the trade balance. Based on the results obtained from the subsequent testing of the hypotheses, the following conclusions were drawn. Both the increase and decrease in the monetary policy rate would affect Nigeria's trade balance significantly.

Based on the findings, the study recommends that:

(1) The government should also encourage export by reducing the monetary policy rate which leads to decrease in interest rate so that there will be surplus trade balance in the country which will in turn increase economic growth.

(2) The government and the monetary authority should make a policy that will lower exchange rate, provides a suitable way of improving competitiveness, reducing the overseas price of exports and making imports more expensive.

(3) The government should also raise a policy to bring more innovation and incentives to increase investment in industries with export potential are supply-side measures designed to boost exports performance and compete more effectively with imports.

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