Exchange Rate and Balance of Payments in Nigeria

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Abstract
This paper investigated the influence of exchange rate on balance of payments in Nigeria from 1981 to 2022. To achieve the above objective, the study collected data on balance of payments, exchange rate, trade openness, government capital expenditure and monetary policy rate from the statistical bulletin of the Central Bank of Nigeria and adopted Autoregressive Distributed Lag (ARDL) bounds test technique of econometrics to capture the short and long-run association between dependent and independent variables. The results revealed that in the long run, exchange rate, government capital expenditure and monetary policy rate have positive relationship with balance of payments in Nigeria. At the same time, trade openness has a negative relationship with balance of payment in Nigeria. In the short run, exchange rate and government capital expenditure have negative and significant relationship with balance of payments. Additionally, monetary policy rate and trade openness have a strong and positive correlation with balance of payments. Therefore, the study recommended that the government should adopt managed floating exchange rate policy to redress the problem of exchange rate variation in the country. Government should also increase production of a variety of good quality goods and services. This is the only way by which the country can induce foreign demand for its products, or at least reduce its demand for foreign products, either of which will have a favourable effect on the country's currency and balance of payments.

Key Words: Exchange Rate, Balance of Payments, ARDL, and Nigeria.

I. Introduction

The rate at which a country's currency is expressed in terms of another plays an important role in any economy because it influences domestic price level, profit margins of traded goods and services, resources allocation and investment decisions. According to Oladipupo (2011), exchange rate is very important because it makes international trade feasible by connecting the price systems of two different countries. In other words, exchange rate influences the relative prices of both domestic and foreign goods, as well as the country's bargaining power and ability to take part in external trade. Exchange rate policy has a wide range of effects on both internal and external balances. Dare and Adekunle (2020) argued that in an economy that depends heavily on imports, the monetary authority's appreciation of the national currency could have a negative impact on the real sector, overall price level, and balance of payments. As a result, scholars and decision-makers have placed a great deal of emphasis on exchange rate volatility and its relationship with balance of payments.

Meanwhile, balance of payments is a country's annual summary of its trade and finance accounts, showing the payments and receipts from the outside world (Umo, 2012). The current account, capital account, and monetary transactions account are the usual components of a balance of payments statement (Gbosi, 2011). A nation's balance of payments establishes the strength of its trading position and functions as a helpful metric for external performance measurement. The connection between the exchange rate and balance of payments is also a significant factor in determining the amount of real and financial investments from outside that are necessary to support sustainable growth. However, one macroeconomic issue that contemporary countries, including Nigeria, are dealing with is balance of payments disequilibrium. Put differently, exchange rate instability is generally considered undesirable in any economy because of its perceived impact on the economy. Because underperformance in the balance of payments can have an undesirable effect on a country's reserves and macroeconomic indicators, achieving balance of payments equilibrium continues to be one of the fundamental goals of exchange rate management (Dare and Adekunle, 2020).

To achieve a stable or unwavering exchange rate in Nigeria, successive governments have adopted several policy options (exchange rate reforms), moving from pegged or fixed exchange rate regime (1960 – 1985), to flexible or floating exchange rate in 1986, and the managed float between 1986 till date (CBN, 2013 and CBN, 2019). Specifically, during the regime of pegged or fixed exchange rate management (1958-1986), controls were applied with varying stringency, depending on the country's external sector position as well as the prevailing economic conditions. As a result, the exchange control system used import licensing and the prescription of permissible transactions to restrict the amount of foreign exchange resources that could be used to finance non-priority items. However, the usage of managed float was introduced in 1986 when the foreign exchange regulation was liberalised. The Central Bank of Nigeria employed the management of foreign exchange reserves to influence the banking system reserves by either raising or decreasing the sale of foreign exchange. During this time, exchange rates were mainly permitted to float but were occasionally susceptible to government intervention. The institutional framework has also undergone a number of changes. For example, the second-tier foreign exchange rate market (SFEM) which later metamorphosed into the foreign exchange market (FEM), autonomous foreign exchange market (AFEM), inter-bank foreign exchange market (IFEM), Wholesale Dutch Auction System (wDAS) and currently Retail Dutch Auction System (rDAS).

Despite several policies adopted, the country has continued to experience unpredictable exchange rate, which has a negative impact on the balance of payments (BOPs). According to a 2013 Central Bank of Nigeria analysis, for example, Nigeria's external sector has been experiencing unpredictability in her overall BOPs, which has raised concerns and questions about the possible sources of this unpredictability. For instance, the external sector of the nation had an overall BOPs deficit in 2013 of 0.2% of the GDP of the nation. The incident was primarily a reflection of rising foreign debt, declining foreign reserves, and an increase in the repatriation of investment income by foreign investors. Significantly, the negative trends in the nation's BOPs have created significant barriers to the accumulation of foreign exchange required for economic growth and development.

Consequently, the quantity of foreign exchange inflow available to support the economy has therefore decreased over time. The country's earnings, which have been under pressure since early 2002, were shown to have a total of £5.797 billion in outflows and $3.796 billion in inflows. As revealed by the Central Bank of Nigeria (2014 and 2015), in the year 2014, the BOPs account noted a deficit equal to 1.7 per cent of gross domestic product, which revealed a decrease of foreign reserves. The decrease in current account was caused mainly by export earnings, from 15,262.8 billion naira in 2013 to 12,988.3 billion naira in 2014 and rising import bills, from 8,628.7 billion naira in 2013 to 9,686.8 billion naira. The external account was adversely affected by instability in the global prices of crude oil in 2015 and little entry of foreign exchange into the country. As a result, the external sector also documented BOPs deficit of ₦1,150.13 billion, corresponding to 1.4 per cent of gross domestic product in 2015. Put succinctly, available data shows that Nigeria has been experiencing deficits in the BOPs in recent years (CBN, 2014, 2015).

However, in 2016, the overall balance of payments deficit narrowed to 0.2 per cent of GDP. Similarly, in 2017, the performance of the external sector resulted in a positive outcome as the estimated overall balance of payments recorded a surplus of N3, 737.37 billion or 3.3 per cent of GDP, as against a deficit of N247.84 billion or 0.2 per cent of GDP in 2016. The improvement reflected the positive global and domestic economic conditions in 2017. In 2018, the external account recorded an overall balance of payments surplus of N990.49 billion, representing 0.8 per cent of GDP, compared with ₦3,737.37 billion or 3.3 per cent of GDP in 2017. This was as a result of favourable crude oil prices, stable domestic crude oil production, and gradual domestic economic recovery, as well as, the relative stability in the foreign exchange market. In 2019, an overall balance of payments deficit of US$2.33 billion, representing 0.6 per cent of GDP was recorded in 2019, in contrast to a surplus of US$3.29 billion or 0.8 per cent of GDP in 2018 (CBN, 2017, 2018 & 2019).

The value of the gross foreign reserve decreased from US$43.06 billion as at December 31st, 2013 to US40.12billion and $38.65 billion February and March 14, 2014, respectively. The steady decline in Nigeria's foreign reserve has far reaching effects on monetary policy and the whole economy. A persistent reduction in foreign reserves could have a number of negative effects, including weakening investor confidence, encouraging the use of foreign currency (dollarization), causing international rating agencies to downgrade government bonds, weakening the value of the naira, reducing foreign inflow into the economy, and increasing interbank rate volatility (Urama and Iloh, 2018).

The impact of unstable currency rates on Nigeria's balance of payments must now be empirically established. This is due to the possibility that, in light of recent changes in the Nigerian economy, it would be misleading to rely solely on historical empirical data on this topic. Notably, the decision of the country's apex bank to switch from monetary targeting to inflation targeting has generated a great deal of interest and discussion among monetary economists in recent years. This is characterized by the declaration of official target ranges for the inflation rate at one or more time horizons, as well as the clear recognition that the primary objective of monetary policy is low and stable inflation (Bernanke and Mishkin, 1997). Although this policy may have been successful in economies with robust and strong producing capacity bases, it may not be as successful in developing nations with poor productive capacity bases, such as Nigeria. For instance, through import inflation (exchange rate pass through), exchange rate volatility may exacerbate inflation.

In recent times, Nigerians are increasingly concerned about the high cost of goods and services, whether they are imported or locally produced. Additionally, life is increasingly difficult for an average Nigerian due to the country's high inflation and interest rates. Businesses are closing or using less of their capacity, which is increasing unemployment and job losses. Businesses and importers are lamenting their inability to break even because of high exchange rates and high cost of capital. The high cost of living, rising rates of inflation, and falling living standards all indicate that Nigeria's economy is in decline. In lieu of the background above, this study examined the impact of exchange rate on balance of payments in Nigeria from 1981 to 2022. Other sections of this study are organized as follows: literature review, material and methods are contained in sections two and three respectively. The empirical results and discussion are presented in section four while the conclusion and policy recommendations are presented in section five.

II. Literature Review
Concept Clarification
Exchange Rate
Exchange rate is simply the price at which one country's currency is exchanged for the currency of another country. But, for purposes of computations, economists usually define this rate or price more precisely. Therefore, exchange rate is defined as either:
  i)   The price of a unit of the domestic currency in terms of a foreign currency (e.g., ₦1500 = $1), or
  ii)   The price of a unit of a foreign currency in terms of the domestic currency (e.g., $1= ₦1500).

Each of these definitions is used in practice by some countries. Nigeria, for instance, uses the second definition, but the United Kingdom (UK) uses the first. It is important to be clear about the definition being used especially when discussing, changes in the rates (Akpakan, 1999; Jhingan, 2003 & Gbosi, 2011). According to Oloyede (2002), the exchange rate is the cost of one currency in terms of another and is a critical factor in all national decision-making, making it an issue that must be addressed by every nation eager to achieve economic growth. Meanwhile, such price or a rate has to be determined in international trade because of the fact that the currencies of the trading partners are different. For instance, every country, as we know, has its own currency. Thus, we have the Nigerian naira, the American dollar, the British pound, the Japanese yen, the German mark, the French frame, and the many other currencies.

For a better understanding of how foreign exchange market works, this paper used a two-country case (i.e., a two-country model of the foreign exchange market). Specifically, this paper used the case of Nigeria and China, and so this paper illustrated the (foreign exchange) market for Yuan. The operators in this market are the Central Banks of the two countries (i.e., The Central Bank of Nigeria and The Bank of China), the approved foreign exchange dealers, the deposit money banks and merchant banks acting on behalf of their customers – the institutions through which naira and Yuan are exchanged for each other.

Assume that Nigerians want to buy a variety of Chinese goods and services, for instance, Chinese books, shirts, shoes, stainless cutlery, houses, tractors, shares in Chinese companies. Since, Chinese suppliers would want to be paid in Chinese Yuan, the Nigerian buyers will have to exchange their naira for the amount of Yuan they need for the transactions. The demand by Nigerians for Chinese goods and services thus generates a demand for Chinese Yuan and a supply of the Nigerian naira in the foreign exchange market. In the same way, the demand by Chinese for Nigerian goods and services - crude oil, palm kernel, cocoa, rubber and shares in Nigerian companies – generates a demand for the naira and a supply of Yuan in the foreign exchange market.

What happens is that when a Nigerian buyer exchanges his naira through his bank for the Yuan he needs to pay to his Chinese supplier, he creates a bank deposit in naira for Yuan. It is from deposits like this that Chinese will pay for purchases from Nigeria. In the same way, when a Chinese buyer exchanges his Yuan through his bank for the naira he needs to pay to his Nigerian supplier, he creates a bank deposit in Chinese Yuan for Nigeria, and it is from such deposits that Nigerians will pay for purchases from Chinese. Thus, the more Chinese goods and services we buy the more naira we give to the Chinese and the more our goods and services Chinese buy the more Yuan they give to us.

From this, it is clear that the rate of exchange between the two currencies will be influenced by the relative strength of the demand for and the supply of each of them. If for stance, the demand for the Yuan increases due to an increase in the demand for Chinese goods and services, its price in terms of the naira (that is, the quantity of naira that will be exchanged for the Yuan) will tend to rise. If the demand for Yuan falls because of a fall in the demand for that country's goods and services, its naira price will tend to fall. If you look at the matter the other way you will see that the same thing will happen to the price of the naira in terms of Yuan. It will tend to rise with a rise in the demand for it, and fall with a fall in demand.

Importantly, if Chinese should want to buy more Nigerian goods and services than before, and therefore they demand more naira (supply more Yuan) than before, there would be pressure on the price of the naira in terms of the Yuan to rise. In this case, Chinese would have to surrender more Yuan than before to get a unit of naira. This time it is the exchange rate of the naira (the price or value of the naira in terms of the Yuan) that would have risen. The implication for the Yuan would be a fall in value in terms of the naira. This is the way the foreign exchange market works.

The next aspect of the foreign exchange market that needs to be examined is why the citizens of one country would want to buy more goods and services from another country. Why Nigerians, for example, would want to buy more Chinese goods and services so that they demand more Yuan over time. It is important to examine this so that we will see why some national currencies (including the Nigerian naira) are almost permanently in trouble.

Why citizens of one country would want to buy more goods and services from another country.
Several factors make one country want to buy more from its trading partner and therefore increase its demand for the partner's currency. They include
a)   differences in the types and qualities of goods and services produced,
b)   differences in the levels of inflation, and
c)   differences in the levels of interest rate.

If a country lacks the capacity to produce some of the things its citizens need, it will have to buy (import) them from its trading partners, and it will increase its demand for the partners' currencies as a consequence. The demand will rise over time as incomes rise in the importing country and/or as the exporting countries turn out increasing varieties of attractive goods and services.

The second factor needs little explanation. Since differences in the levels of inflation will mean differences in the levels of prices, we can easily see that they will affect demand. If the price level is lower in country A than country B, the residents of country B will find the products of country A generally cheaper to them than those of their country. They will therefore want to buy more from country A (if there are no restrictions). This is an economic law in action. The citizens, as normal consumers, are interested in the satisfaction they derive from their purchase; they will buy from the sources that guarantee the highest possible level of satisfaction.

The point about interest rate differences is that they influence the flow of capital (investment funds) into and out of countries. If interest rate levels are higher in country A than country B, the tendency is for capital to flow out of country B and into country' A (if there are no restrictions). The flow of capital into country A, because it increases the demand for that country's currency, pushes up its price (value) in terms of other currencies. Country B, out of which capital has moved, suffers the opposite effect, a fall in the price (value) of its currency in terms of the currencies of the other countries.

In each case, the extent to which the exchange rate will actually respond to the pressures resulting from change in demand and supply depends on the exchange rate policy that is adopted by the country, that is, the way the government handles the determination of the rates of exchange between its currency and the currencies of the various countries with which it does business.

Exchange Rates Determination
There are two primary methods by which exchange rates are set: either by the market or by the government. They are 'administered' or 'fixed' (or pegged) when they are set by the government. They are referred to as "flexible" or "floating" when they are set by market forces, or the forces of supply and demand. This is because the rates in such a scenario are free to fluctuate up and down in response to the strength of forces of demand and supply. But there are two forms of the floating exchange rate system, and they are so different that treating them as one is misleading. They are the **free floating exchange rate** (clean float) and the **managed floating exchange rate** (dirty float) systems or policies. The free floating and the fixed exchange rate policies are the two extremes of the approaches to exchange determination. The managed floating exchange rate policy lies in between the two extremes. Three broad exchange rate policies have so far been suggested and tried: the fixed, the free floating, and the managed floating exchange rate policies (Akpakan, 1999). This paper examined each of them to see what exactly is involved.

Free Floating Exchange Rate Policy: A country is said to be operating a free floating exchange rate system or policy if the rates at which its currency exchanges for other currencies are completely free to fluctuate daily in reaction to shifts in demand and supply in the foreign exchange market. In this case, a rise in foreign demand for the nation's goods and services will result in an increase in the value of the nation's currency relative to other currencies, whereas a rise in domestic demand for foreign goods and services will result in a decrease in the value of the nation's currency relative to other.
In contrast to a fixed exchange rate system, which requires government (official) measures to establish and preserve market equilibrium, a free floating exchange rate system eliminates the need for such actions. The price mechanism completes the task. This is why the system of freely floating exchange rates is appealing.

Managed Floating Exchange Rate Policy: In this arrangement, the government occasionally intervenes but otherwise permits currency rates to fluctuate. It (i.e., managed floating exchange rate policy) combines the characteristics of the two techniques since it falls between their two extremes, fixed and free floating. The concept behind the managed floating exchange rate system is to let supply and demand dictate the long-term trend in exchange rates, while giving the monetary authorities the latitude to intervene arbitrarily in response to short-term volatility that they perceive could jeopardize their goal of stable long-term exchange rate levels. The government accepts the argument that in the long-run exchange rates will have to respond to the forces of demand and supply, and therefore it allows them to float. But it enters the market to influence the rates (by buying and selling currencies) any time it thinks that they are fluctuating dangerously, that is, whenever the variations tend to generate instability in the system (Akpakpan (1994). Akpakpan (1999) illustrated this idea diagrammatically as displayed in Figure 1:

A Spectrum of Exchange Rate Systems

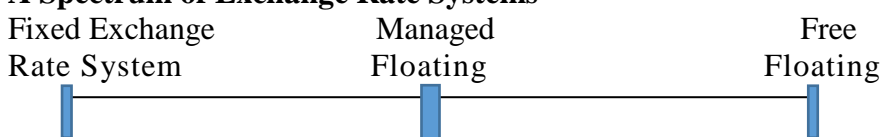Fixed Exchange Rate System — Managed Floating — Free Floating

Figure 1
Figure 1 reveals that from the completely or rigidly system on the extreme left we move to the managed floating system in the middle and to the completely free floating system the extreme right. The middle system in the spectrum, the managed floating system, by its position, and as we indicated in the definition, combines some of the elements of the two extremes. There will be some of the elements of the fixed system in it as well as some of the elements of the free floating system. This means that we should not expect to see exactly same thing, exactly the same practices, in any two countries operate the managed floating exchange rate system. Since it is a matter of combinations of elements of the two extremes, and we do not have, even in theory, prescribed combinations should qualify as a managed floating system, it must be true that each of many different combinations of the two extremes will qualify to be described as a managed exchange rate system.

Balance of Payments

Balance of payments (BOPs) is an accounting statement that summarizes the economic transactions between residents of the home country and all other countries. BOPs statement has three main parts, namely the current account section, capital account section and the financing or monetary movements account. The current account summarizes information about purchases and sales of goods and services across national boundaries. Capital account records changes in the country's assets in foreign countries, and changes in foreign countries' assets in our country. While financing account shows how the government settled a deficit (when in deficit) and what it did with the surplus (when in surplus). Often, a surplus is used to increase external reserves, while a deficit is met by running down external reserves. When a nation's payments (outflows) surpass its inflows from overseas trade, its balance of payments experience an unfavourable state, known as disequilibrium. The method used to address balance of payments disequilibrium (issue) depends on its underlying cause, according to Akpakpan (1999). Where a balance of payments problem is caused by high levels of investment abroad (i.e., by capital account transactions or where the country has made high levels of investment abroad and/or granted a high level of aid to other countries), it may not be a bad thing after all if the earnings on the investment are returned to the country. Such earnings would improve the country's balance on investment income in the current account section. When it is caused by deficits on the current account, then there is a real problem which the country will have to try to solve if it wishes to avoid excessive external borrowing with all its economic and political problems.

If the problem is caused by a deficit on the current account, which shows that the country has imported more goods and services than it has exported, the country will have to strive to increase its exports and reduce its imports. The specific measures which could help a country in pursuing this objective include the following:

i. A stimulation of local production (with improvements in the quality of output) in order to reduce the need to import goods from other countries.

ii. A stimulation of export production in particular in order to increase the earnings from exports. To be successful in this, those engaged in production will have to strive to produce high quality products, and to do so efficiently.

iii. Exchange control, i.e., controlling access to foreign currencies.

iv. Import restrictions through tariffs and quotas.

v. A devaluation of the country's currency. However, devaluation is usually adopted as a last resort (Akpakpan, 1999).

Theoretical Review

The Elasticity and Absorption Approaches to Balance of Payments and Exchange Rate Determination

The elasticity approach is a theoretical framework that highlights variations in the prices of goods and services as the primary factor influencing a country currency's exchange value and balance of payments. The amount of local currency paid for imports and the amount received for exports might fluctuate due to currency depreciation or appreciation, which can also affect the amount of exports supplied and the amount of imports demanded. The amount by which the quantity of imports demanded and the quantity of exports supplied (and, therefore, the balance of payments) change is determined by the elasticity of exports supply and the elasticity of import demanded (Joseph and David, 2005).

Moreover, this approach places emphasis on how a country's actual income and expenses determine its balance of payments and currency's exchange value. It states that a country will have a current account surplus if its real revenue is higher than the amount of goods and services it consumes (in monetary term). A country will have a current account deficit if its actual income is lower than the quantity of goods and services it consumes. The country's current account will be balanced if actual income and absorption are equal. As a result, all levels of government must work to strike a balance between their consumption and their revenue. Regarding changes in real income and absorption and a nation's current account balance and the exchange value of its currency; According to Joseph and David (2005), the absorption approach shows that if real income increases more quickly than absorption, exports will outpace imports, the country's balance of payments would improve, and the value of the local currency will increase. If absorption rises faster than real income, then imports rise relative to exports, the nation's balance of payments deteriorates, and the domestic currency depreciates. A similar argument holds when real income and absorption decline.

Purchasing Power Parity Theory of Exchange Rates

The purchasing power parity theory states that, the normal equilibrium rate of exchange between two inconvertible currencies is determined by the ratios of their purchasing powers. When the purchasing capacities of two currencies are equal, the exchange rate is typically set (Vaish, 1982). The following arguments have been made against the theory, according to Gbosi (2011): (i) Considering other factors that influence exchange rates, such as tariffs, it is not always realistic to assume a direct relationship between the purchasing power of currency units and the rate of exchange. (ii) The theory does not distinguish between the prices of domestic and imported items; instead, it compares the general levels of prices in the two nations. Since many commodities are not traded worldwide, they are not eligible to be taken into account when determining the relative price ratios of the various nations. (iii) The theory ignores the supply and demand for foreign exchange that originates from sources other than international trade in tangible items. In actuality, the market dynamics and consequently the exchange rate are influenced by short-term capital flows, unilateral transfers, shipping expenses, banking fees, and insurance premiums taken together. The theory is nevertheless applicable to the explanation of exchange rates, notwithstanding these drawbacks.

Review of Related Empirical Literature
Oladipupo (2011) used the Ordinary Least Squares (OLS) technique of estimation to empirically evaluate the impact of exchange rate on the Nigerian balance of payments position with data spanning the years 1970 to 2008. The outcome showed that the exchange rate significantly affects the position of the balance of payments. If budgetary restraint is practiced, the depreciation of the exchange rate may actually enhance the situation of the balance of payments. The outcome also showed that some of the reasons for Nigeria's ongoing balance of payments deficits include inappropriate use and allocation of domestic credit, fiscal irresponsibility, and a lack of suitable spending control measures as a result of government centralization of power.

Abdullahi, Abubarkar, Fakunmoju and Giwa (2016) used Ordinary Least Squares technique to investigate the influence of foreign exchange rate on balance of payments in Nigeria from 1970-2014. The outcome indicated that exchange rate and money supply have positive effect and significantly affect Nigeria balance of payments. Money supply, real gross domestic product, consumer price index and interest rate have negative effect but insignificant on Nigeria balance of payments.

With the aid of multivariate regression model, Nwanosike, Uzoechina, Ebenyi and Ishiwu (2017) evaluated the effects of devaluation of domestic currency on Nigeria's balance of payments using Marshall-Learn (ML) condition from 1970 to 2014. The outcome showed that, devaluation of exchange rate had negative effect on balance of payments through balance of trade mechanism.

Gatawa, Elijah and Umar (2018) studied balance of payment as a monetary phenomenon in Nigeria from 1986 to 2016 using pairwise granger causality test and Autoregressive Distributed Lag (ARDL) methods. The study discovered a negative and statistically significant association in both short-run and long-run between balance of payment and exchange rate in Nigeria. The Granger Causality/Block Exogeneity further revealed that the major determinant of exchange rate is real GDP. It further revealed that the nexus among the variables is indeterminate.

Aidi (2018) used the technique of Ordinary Least Squares (OLS) to examine the relationship between Nigeria's balance of payments, inflation, and exchange rate from 1986 to 2015. The result revealed among other that the core variables (exchange rate and inflation) of this study have statistically significant negative impacts on balance of payment in Nigeria during the investigated period. Furthermore, the outcome demonstrated that real gross domestic product, money supply, and domestic credit are statistically important factors influencing Nigeria's balance of payments.

Delimus, Obuneke, and Muhammad (2018) used the Autoregressive Distributed Lag (ARDL) approach to study the impact of exchange rate on Nigeria's balance of payments from 1999 to 2016. Findings from the study revealed that nominal exchange rate had significant effect on Nigeria's balance of payments.

Okonkwo (2019) evaluated the relationship between exchange rate variation and balance of trade in Nigeria spanning 1988 to 2018. The researcher employed the Ordinary Least Squares (OLS) as the main technique of analysis. The outcome of the analysis showed the existence of a significant association between exchange rate and balance of trade.

Limbore and Moore (2019) used secondary data from the RBI (Central Bank of India) spanning the years 2001 to 2018 to investigate the impact of currency rates on balance of payments. The descriptive

approach was used to analyse the variables, which included import, export, trade account balance, current account balance, and overall balance data. According to the study, the exchange rate was extremely erratic, which had an adverse effect on the balance of payments.

Dare and Adekunle (2020) investigated the policy impact and implications of currency rate on Nigeria's balance of payments from 1986 to 2018 using Granger causality and Autoregressive Distributed Lag (ARDL) methodologies. The ARDL result demonstrated that trade openness and exchange rate positively impacted Nigeria's total balance of payments performance, while the causality result demonstrated an independent relationship between the two variables. These results suggest that exchange rate stability is important for improving the performance of the balance of payments by encouraging commerce.

Nwachukwu (2021) examines the effect of currency rate on Nigeria's balance of payments from 1981 to 2019 using the Vector Error Correction Mechanism (VECM) and Granger causality methodologies. The findings showed a strong and positive correlation between Nigeria's exchange rate and balance of payments. The outcome also demonstrated a causal link between changes in exchange rates and Nigeria's balance of payments.

Ukangwa, Ikechi, Onyenze, and Uke-ejibe (2022) investigated how Nigeria's balance of payments conditions were affected by exchange rates between 1981 and 2021. Auto-Regressive Distributive Lag (ARDL) was used in the study to calculate the short- and long-term effects of exchange rates on Nigeria's balance of payments (BOP). Exchange rate and balance of payments in Nigeria have a long-term relationship, according to the Auto-Regressive Distributive Lag (ARDL) bound cointegration test. The empirical finding ultimately demonstrated that exchange rates only had a long-term, negative and considerable impact on Nigeria.

Chi Dieu and Hong (2022) looked into how the foreign currency rate affected Vietnam's balance of payments between 2000 and 2020 using the Auto-Regressive Distributed Lag (ARDL) and Granger Causality Test methods. The results showed that the balance of payments in Vietnam has been meaningfully influenced by foreign exchange rate. The outcome suggested that a developed and productive economic environment appears to be created when the foreign exchange rate is constant.

Interestingly, experiential evidence on the association between exchange rate and balance of payments has been conflicting with contradictory findings as a result of differences in samples used, econometric techniques, model specifications and country peculiarities. This discrepancy in empirical research findings has further increased interest in the topic in recent years. This study improved on reviewed literature by expanding the scope to 2022 to reflect the current trends in Nigeria exchange rate and balance of payments.

III Materials and Methods

This study employed ex-post facto research design which is frequently used as a substitute for true experimental research to test hypotheses about cause-and-effect relationships. The study used secondary data from 1981 to 2022 for the analysis. Essentially, the researcher would have loved to cover from 1960 when Nigeria gained independent to 2023 but because of paucity of data the researcher decided to cover for the period data were available. Therefore, the period 1981 to 2022 was chosen because of paucity of data. Data for the study were collected from the statistical bulletin of Nigeria's apex bank. In order to carefully investigate the impact of exchange rate on balance of payments in Nigeria, the study adapted the model of Nwachukwu (2021) who in his study of exchange rate and balance of payments in Nigeria formed a model with Balance of Payments (BOPs) as a dependent variable while exchange rate, interest rate, trade openness and crude oil price were independent variables. This current study modified the model of Nwachukwu (2021). Therefore, the model for this study is presented thus:

$$BOP_t = a_o + a_1 LnEXR_t + a_2 LnTOP_t + a_3 LnGCEX_t + a_4 MPR + u_t \hspace{2cm} (1)$$

Where: BOP is Balance of Payments, EXR is Exchange Rate, GCEX is Government Capital Expenditure and MPR is Monetary Policy Rate (interest rate), α_0 = intercept parameter, u = error term, $\alpha_1 - \alpha_4$ = slope parameters. **On the apriori**, it is expected that; $\alpha_1 - \alpha_3 > 0$ and $\alpha_4 < 0$

Techniques of Data Analysis

The techniques that were employed to analyze the data are: unit root test via Augmented Dickey Fuller test (ADF) and Autoregressive Distributed Lag (ARDL). The ADF unit root test helps to ascertain stationarity of the variables, and the general form of the ADF is presented thus:

$$\Delta y_t = \alpha_0 + \alpha_1 y_{t-1} + \Sigma\alpha_1\Delta y_i + \delta_t + u_t \qquad (2)$$

Where: y is a time series, t is a linear time trend, Δ is the first difference operator, α_0 is a constant, n is the optimum number of lags in the independent variables and u is random error term. In order to examine the short-and long-term relations between exchange rate and balance of payments, Autoregressive Distributed Lag (ARDL) was used. The reason is that estimates provided by ARDL method avoid problems such as autocorrelation and endogeneity, they are unbiased and efficient. The ARDL model for this study is presented thus:

$$\Delta BOP_{t,j} = C_0 + C_1 BOP_{t-1,j} + C_2 LnEXR_{t-1,j} + C_3 LnTOP_{t-1,j} + C_4 LnGCEX_{t-1,j} + C_5 MPR_{t-1,j}$$
$$+ \sum_{i=1}^{n1} a_{1i,j}\Delta BOP_{t-1,j} + \sum_{i=0}^{n2} a_{2i,j}\Delta LnEXR_{t-1,j} + \sum_{i=0}^{n3} a_{3i,j}\Delta LnTOP_{t-1,j}$$
$$+ \sum_{i=0}^{n4} a_{4i,j}\Delta LnLnGCEX_{t-1,j} + \sum_{i=0}^{n5} a_{5i,j}\Delta MPR_{t-1,j} + \lambda ECMt - 1 + \mu_t \quad -- --- (3)$$

Where Δ is the difference operator while μt is white noise or error term, n is the optimal lag length, $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ and α_5 represent the short run dynamics of the model and c_1, c_2, c_3, c_4 and c_5 are the long run elasticities and μ_t is the error term. ECM_{t-1} is the error correction term obtained from the co-integration model. The error coefficients (λ_1) show the rate at which the co-integration model corrects its previous period's disequilibrium or speed of adjustment to restore the long run equilibrium relationship. The coefficient of ECM is expected to be negative and statistically significant. A negative and significant ECM_{t-1} coefficient implies that any movement in short run between the explained and independent variables will converge back to the long run relationship.

IV. Results And Discussion
The empirical analysis focused mainly on estimation of the regression model and post estimate test.

Unit Root Test Result
The test for the stationarity status of all variables in the model to establish their order of integration precedes the ARDL bounds test, the reason for this is to be sure that the variables are stationary at level 1(0) and first difference 1(1) only but not second difference I(2) so as to avoid spurious regression results. Therefore, the ADF technique was used to test for the stationarity of the variables in the model. See Table 1.

Table 1: Augmented Dickey-Fuller (ADF) Unit Root Test

Variables	Level form		First difference		Order of integration
	ADF Statistics	5% Critical Value	ADF Statistics	5% Critical Value	
BOP	-2.745653	-2.935001	-5.461790	-2.938987	1(1)
EXR	-0.297670	-2.935001	-7.450084	-2.936942	1(1)
TOP	-0.626923	-2.935001	-6.979157	-2.936942	1(1)
GCEX	4.904887	-2.957110	-7.515115	-3.557759	1(1)
MPR	-3.346950	-2.935001	-	-	1(0)

Note: BOP, EXR, TOP, GCEX and MPR as earlier defined
Source: Author's Computed Result from (E-views 10)

The result of the ADF test for each of the series presented in Table 1 reveals that at five per cent level of significance, MPR was stationary at level 1(0) as its ADF statistics is greater than 5 per cent critical values, while BOP, EXR, TOP and GCEX were stationary at first difference 1(1). Given that the variables were integrated of order 1(0) and 1(1). The requirement to fit in an ARDL model to test for long run relationship is satisfied.

Table 2: ARDL Bounds Test for Co-integration

Model	F-Statistic = 6.540266
BOP= F(EXR, TOP, GCEX, MPR)	K = 4
Critical Values	Lower Bound	Upper Bound
5%	3.47	4.57

Source: Author's Computed Result from (E-views 10)

The result of the ARDL bounds test for co-integration reveals that there is a long run relationship amongst the variables (BOP, EXR, TOP, GCEX and MPR). This is because the computed F-statistic of about 6.54 is greater than the upper critical bounds at 5% critical value. This provided evidence to discard the null hypothesis of no cointegration at 5% significance level for the BOP model. Based on this finding, the study obtained the long-run and short-run dynamic parameters for the variables.

Table 3: Estimated ARDL Long Run Coefficients. Dependent Variable: BOP ARDL (4, 4, 4, 4, 3)

Regressors	Coefficient	t-Statistic	P-Value
LOG(EXR)	673846.1	0.944872	0.3620
LOG(TOP)	-3958013.	-1.738964	0.1056
LOG(GCEX)	4478552.	1.932897	0.0753
MPR	78831.68	1.218310	0.2448

Source: Author's Computed Result from (E-views 10)

The estimated ARDL long run coefficients in Table 3 reveal that in the long run, exchange rate, government capital expenditure and monetary policy rate have positive relationship with balance of payments in Nigeria. At the same time, trade openness has a negative relationship with balance of payments in Nigeria. Surprisingly, none of the variables is statistically significant at conventional level (i.e., 5 %). This means that in the long run, policies regarding exchange rate, trade openness, government capital expenditure and monetary policy rate will not significantly influence balance of payments position of Nigeria.

Table 4: Error Correction Representation for the Selected ARDL Model ARDL (4, 4, 4, 4, 3)

Regressors	Coefficients	t-Statistic	P-Value
LOG(EXR)	-3255564	-3.397391	0.0048
LOG(TOP)	3869802.	0.000000	0.0000
LOG(GCEX)	-1664839	-2.007579	0.0659
MPR	201928.4	2.411890	0.0314
ECM (-1)	-0.935285	-4.916885	0.0001
R^2= 0.828814	D-W stat. = 2.223387	Prob(F-statistic) = 0.002399	
Akaike info criterion = 30.75721	Schwarz criterion = 31.66219	F-statistic = 4.115345	

Source: Author's Computed Result from (E-views 10)

Table 4 indicates that the dynamic model is a good fit. The reason is that the difference in our predictors account for 83 percent of the overall disparity in our model looking at the R^2. Put differently, the R^2 value of 0.83 indicates that the variation in balance of payments explained by exchange rate, trade openness, government capital expenditure and monetary policy rate is 83 percent. Therefore, the explanatory power of the model estimated is 83 percent. The Durbin Watson (DW) value of 2.223387 which is approximately 2.0, suggests that autocorrelation is not a problem to the model. Moreover, an important characteristic to be noticed in Table 4 is the coefficient of the parameter of error correction term. The coefficient of the error correction term appears with the right sign (i.e., negative) and statistically significant. It therefore, follows that the ECM could rightly correct any deviations from short run to long-run equilibrium relationship between BOP and the explanatory variables.

However, the coefficient of exchange rate (EXR) was wrongly signed (i.e., negative) implying a negative relationship between exchange rate and balance of payments. This does not conform to apriori expectation. This means that a percentage increase in the rate of exchange of naira will lead to about 3255564% decrease in balance of payments. Moreover, the absolute value of the t-statistic for the slope coefficient is significant at conventional level (i.e., 5 %). This means that exchange rate significantly impacted on balance of payments during the period of study. Put differently, the implication of this result is that exchange rate variable has the ability to raise the balance of payments position of Nigeria. Hence, if exchange rate policy is managed very well it will stabilize the balance of payments of Nigeria. The

significant relationship between exchange rate and balance of payments reflect the potency of the variable (i.e., exchange rate) as an important conduct in transmitting monetary policy impulses to the aggregate economy thereby raising the balance of payments position. This is consistent with earlier studies including Aidi (2018) who reported that exchange rate has statistically significant negative impact on balance of payment in Nigeria.

Moreover, the coefficient of trade openness appears with right sign (i.e., positive). This conforms to the apriori expectation. Thus, a percentage increase in trade openness (higher degree of trade openness) will raise the balance of payments position of Nigeria by 3869802 per cent. Also, the absolute value of the t-statistic for the slope coefficient is significant. Thus, the study accepts that trade openness has significantly impacted on balance of payments in Nigeria during the period of study. The implication of this result is that trade openness impacted on balance of payments of the country meaningfully. It also suggests that policies toward economic openness (trade openness) have been well articulated and coordinated toward achieving a meaningful increase in balance of payments in country during the period of study.

Furthermore, the coefficient of government capital expenditure appears with wrong sign (i.e., negative). This does not conform to the apriori expectation. Thus, a percentage increase in government capital expenditure will decrease the balance of payments position of Nigeria by 1664839 per cent. However, the absolute value of the t-statistic for the slope coefficient is significant. Thus, the study accepts that government capital expenditure has significantly impacted on balance of payments in Nigeria during the period of study. The implication of this result is that if expenditure made by the federal government on capital projects is well managed it will have a meaningful impact on balance of payments of the country.

In addition, the coefficient of monetary policy rate was wrongly signed (i.e., positive) implying a positive relationship between monetary policy rate and balance of payments. However, the absolute value of the t-statistic for the slope coefficient of monetary policy rate is significant at conventional level (i.e., 5 %). The implication of this result is that there is a significant relationship between monetary policy rate and balance of payments position of Nigeria during the period of study.

Post Estimation Diagnostic Tests Results
Diagnostic tests were conducted in this study to verify whether or not the estimated model is reliable for policy prediction or recommendation purpose. This study specifically employed the Wald test for coefficient of restriction and normality test for the diagnostics or post-estimation analyses. The various test results are hereby reported in Table 5 and Figure 1.

Wald Test
The Wald test is applied to confirm if the coefficients of the causal variables in the ECM model are jointly significant. The F-statistic in Tables 5 was utilized to ascertain this.

Table 5 Wald Test Result

Wald Test:			
Equation: Untitled			
Test Statistic	Value	Df	Probability
F-statistic	27.70718	(5, 13)	0.0000
Chi-square	138.5359	5	0.0000

Source: Author's Computed Result from (E-views 10)

The result in Table 5 shows that the F-statistic is approximately 28 and the probability value of 0.0000 is less than 0.05 at the conventional 5 per cent level. Therefore, all the independent variables used in the model are jointly important in explaining balance of payments in Nigeria during the period of study.

Normality Test Result
The Jarque-Bera statistic was applied to examine whether the error term in the output growth model is normally distributed at 5 per cent significance level.

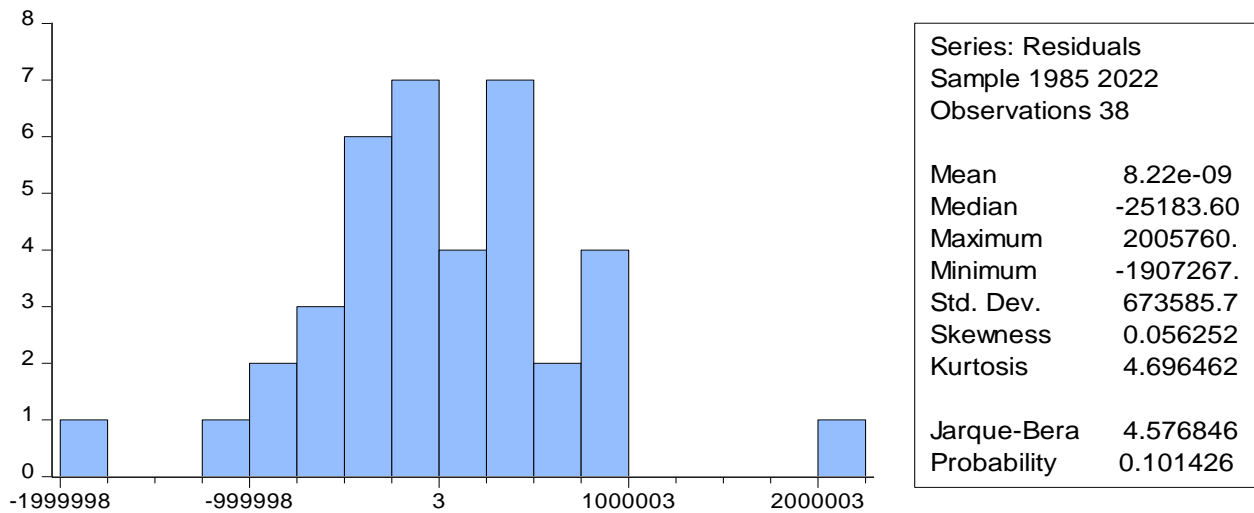| Series: Residuals	
Sample 1985 2022	
Observations 38	
Mean	8.22e-09
Median	-25183.60
Maximum	2005760.
Minimum	-1907267.
Std. Dev.	673585.7
Skewness	0.056252
Kurtosis	4.696462
Jarque-Bera	4.576846
Probability	0.101426

Figure 1: Normality Test Result

Source: Computed by the researcher using E-Views 10.

The result shown in Figure 1 depicts that the error term is normally distributed at the conventional level (i.e., 5%). This is because the probability value of the Jarque-Bera statistic of approximately 0.101 is greater than the 0.05% conventional level. This implies that the Jarque-Bera statistic hypothesis of normally distributed residuals in the ECM model is accepted.

V. **Conclusion and Recommendations**

This study on the impact of exchange rate on balance of payments in Nigeria from 1981 to 2022 is very important because it empirically investigated the degree to which Nigeria's exchange rate policies have influenced Nigeria's balance of payments position from 1981 to 2022. This study collected data on balance of payments, exchange rate, trade openness, government capital expenditure and monetary policy rate from the statistical bulletin of Nigeria's apex bank and adopted Autoregressive Distributed Lag (ARDL) bounds test technique of econometrics to capture the short and long-run association between dependent and independent variables. The results revealed that in the long run, exchange rate, government capital expenditure and monetary policy rate have positive relationship with balance of payments in Nigeria. At the same time, trade openness has a negative relationship with balance of payments in Nigeria. In the short run, exchange rate and government capital expenditure have negative and significant relationship with balance of payments. Also, trade openness and monetary policy rate have positive and significant relationship with balance of payments. Therefore, the study recommended that the government should adopt managed floating exchange rate policy to redress the problem of exchange rate variation in the country. In addition, government should encourage and increase the production of high quality goods and services. This is the only way by which the country can induce foreign demand for its products, or at least reduce its demand for foreign products, either of which will have a favourable effect on the currency and the balance of payments. To be able to raise the level of production in our nation to meet our needs and be able to sell to other countries, government should encourage citizens to acquire, by any means, all aspects of the relevant production knowledge, i.e., the relevant production technologies. Citizens will have to have, for example, all aspects of the technologies for the production of kerosene, fuel, diesel, milk, cornflakes, clothing materials, shoes, radio sets, television and video sets, building materials, motor vehicles, ships, shipping services, aircrafts, aviation services, and the many other goods and services citizens may wish to produce, to be able to increase production the way they want. Therefore, governments should get more actively involved in technology transactions in the economy than they have been in the past. This should, include: clarification of the country's technology policy; strict regulation and monitoring of technology transactions in the economy; increased funding of basic research; co-ordination, increased funding, and monitoring of applied research efforts; and effective implementation of policies and programmes which in turn will help the country to achieve favourable balance of payments.

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