Impact of Diaspora Remittance on Balance of payment in Nigeria: Dynamic Ordinary Least Square Method (DOLS)

Chude Adaora Rose [1*], Onodu Eberechukwu Nkem [2], Umeh Anthony Chinedu [3]

[1] Department of Business Administration and Management, Federal School of Statistics, Amaechi Ulor Enugu State Nigeria
[2] Ph.D., Economics Department, Enugu State University of Science and Technology (ESUT)
[3] Ph.D., Economics Department, Peaceland University Enugu

* Corresponding Author: **Chude Adaora Rose**

Article Info

Abstract

The study examined the diaspora remittance on balance of payment in Nigeria. The specifically, the study sought to: determine the impact of remittance on balance of payment in Nigeria and determine direction of causality relationship between remittance and balance of payment in Nigeria. This study adopted ex post-facto research design. These variables consist of value of balance of payment (BOP), diaspora remittance (REM), trade openness (TRADE) and exchange rate (EXCH) for the period of 1990 to 2024. The method of data analysis were descriptive statistics, Correlation Matrix of the Variables, Augmented Dickey-Fuller Unit Root test statistic, Johansen Co-integration test. The estimation technique includes Dynamic Ordinary least square (DOLS) while post-estimation techniques involves Histogram Normality Test. The empirical result showed that diaspora remittance has positive and significant impact on balance of payment (t-statistics; 7.7346; P-value; 0.0000 < Sig-value: 0.005). The result of pairwise granger causality test showed that there is bilateral causality relationship between diaspora remittance and balance of payment in Nigeria (F-statistics; 6.2126; P-value; 0.5611 > Sig-value: 0.0008). The study recommended that Nigeria government should implement policies encouraging the prudent use of funds received through remittances, directing them into productive investments. This strategy can stimulate increased inflow of remittances into the country.

Keywords: Diaspora Remittance, Balance of Payment and Dynamic Ordinary Least Square (DOLS)

1. Introduction

1.1. Background of the Study

In recent years, remittances have been one of the largest sources of international capital inflows to developing economies as they account for approximately 27 percent of the gross domestic product (Ikwuagwu, Onyele & Onyele, 2024) [16]. The persistent increase in the flow of remittances to developing nations can be attributed to the improved immigration between the developed and the developing countries as well as the technological advancement that has enhanced the international transfer of payment between individuals at a low cost (Awara & Ihuoma, 2023) [8]. According to the World Bank, foreign remittances are personal transfers or compensation of workers. Imouokhome, (2023) [17] noted that remittances constitute a prominent source of savings and capital for investments in health, education, and entrepreneurship thereby enhancing productivity and employment, which culminate into economic growth and poverty alleviation. Remittances can also aid the enhancement of financial sector growth on the notion that some of the remittances are converted and deposited with banks thus making the funds available for lending to the private sector and this, in turn, facilitate economic growth (Abiola & Ajibola, 2022) [1]. Remittances provide support for the welfare of the relatives left behind thus contributing to the eradication of poverty in the recipient country.

For developing economies like Nigeria, overseas remittances are vital source of income for many households. The majority of overseas remittances are aimed at easing the financial situation of the households receiving the money. The World Bank report

on Africa added a few countries account for a substantial share of remittances to Sub-Saharan Africa and North Africa and Nigeria is high ranking in the remittances chart. The remittances to Nigeria, $10,045 billion equaled about half of all officially recorded remittances to Sub-Saharan Africa in 2010." That is the estimated remittances flow into Nigeria from its people abroad were $10,045 billion in 2020 and $10,681 billion in 2021 and the expected remittance to flow to developing countries in 2022 is total $351, and worldwide remittances, including those to high-income countries, will reach $406 billion in 2022 (Adewumi, Obansa, Oluwatosin & Nsonwu, 2024) [5].

Nigeria has a strong and growing Diaspora community, especially in the US, Europe and Asia, many of whom are responsible for this remittance flows. Nigeria qualifies as the 10th country on a list of the world's most remittances recipient countries, with an annual inflow of remittances amounting to 4.5% of its GDP share (Nangih & Nwineewii, 2023) [24].

In Nigeria, remittance flows as a percentage of GDP have consistently exceeded oil revenues from 2015 to 2020. For instance, in 2018, migrants' remittances in Nigeria reached $25 billion, representing 6.1% of GDP, with a projected growth rate of $34.8 billion by 2023 (Adeagbo, 2024). During the same period, the country experienced a massive outflow of labour, with some 10% of the population living and working abroad by the end of 2024 (Nangih & Diepreye, 2024) [23]. At the same time, remittances received showed an upward trend. Nigeria has a high dependency on remittances and this is a challenge to the Nigerian economy. It is therefore interesting to dig deeper into the impacts of diaspora remittances and investigate if it is a benefit, or a burden, to the country.

1.2. Statement of the Problem
The Nigerian economy is opened to the global space and to several sources of financial flows, which include export revenue, capital flows, remittances, official development assistance (foreign aid), loans, grants, foreign direct investment and so on. Among the developing countries, Nigeria receives reasonable amount of remittances from her indigenes in diaspora, she received $17.57 billion in direct diaspora remittances between January and November 2019 (Mbadiwe & Egesimba, 2023). This represents a 210% increase from $5.66 billion in 2010 to $17.57 billion as at November 2019. Despite the large inflows of remittances into Nigeria, economic growth is still sluggish. Nigeria is the leading recipient of remittances in Africa, with implications that more Nigerians are resident outside the country compared to other African countries. This is an indication of the underdeveloped state of the economy, the prevalent lack of opportunities and underemployment (Adeseye, 2021) [4].

Despite huge remittances received by the country, the problems of poverty, unemployment and inequality still persist and indication that Nigeria may not have efficiently utilized the gain from brain drain in terms of remittances (Okorie, Nwabufo & Oriaku, 2019). Moreover, the bad economic situation of Nigerian citizens made most of the recipients of remittances to consume instead of investing them. Researchers have found both positive and negative impacts of remittances on economic growth (Adeagbo & Ayansola, 2024: Adeseye, 2021) [2, 4]. Also, there are studies that show that no impact of remittances on economic growth (Anetor, 2019, Ari, 2020; Bashir, 2020) [6]. So, there is no conclusive answer regarding the impact of remittances on

economic growth as the situation of contrasting findings possibly results from multiple channels of remittances. Owing these backdrops, the study aimed to identify impact of diaspora remittance on balance of payment in Nigeria.

1.3. Objectives of the Study
The main objective of the study is to examine the diaspora remittance on balance of payment in Nigeria. The specific objectives are to:
1. Determine the impact of remittance on balance of payment in Nigeria.
2. Determine direction of causality relationship between remittance and balance of payment in Nigeria.

1.4. Research Questions
This study seeks to provide answers to the following research questions.
1. What is the extent to which remittance on balance of payment in Nigeria?
2. What is the direction of causality relationship between remittance and economic growth in Nigeria?

1.5. Significance of the Study
This study would be beneficial and relevant to migrants, government and researchers.

Migrants: the outcome of this study would be useful to They will receive crucial information on how the funds supplied may be applied to more pressing needs and investments, which could produce more significant growth outcomes in the home and economic realms.

Government: The study's findings would also provide helpful information for various government ministries and organizations tasked with overseeing the nation's development requirements as well as its migration policies. This will assist in resolving the existing issue where data on foreign migration and the effects of remittances on migrant families cannot be easily recognized and measured in the nation.

Researchers: The outcome of this study would be useful to researchers by adding knowledge to the existing literature and provides a basis for future research in the area of remittance and balance of payment in Nigeria.

2.1. Conceptual Literature
2.1.1. Remittance
Remittance has been defined by many scholars from different disciplines and organizations. According to Abiola and Ajibola, (2022) [1], remittance is defined as money sent home by migrants working abroad to their home countries. Similarly, remittance has been defined as a portion of migrant workers' earnings sent to their countries of origin and this could be in cash or gifts (Javid, Arif & Qayyum, 2022; Karagöz, 2019) [19]. Moreover, (IMF, 2019) maintains that remittance is limited to money sent by migrant workers who have been staying in a foreign country for more than a year to his/her household in his/her country of origin and this does not include migrants that are self-employed.

Similarly, Mbadiwe and Egesimba, (2023) [22] argues that remittances are financial and non-financial materials that migrants receive while working overseas and sent back to their households in their countries of origin. Owotemu, Ifechi-Fred and Faleti, (2024) [26] also defines remittances as migrants' funds' transfers, which are resources that a migrant conveys into or takes out of a country. Consequently,

International Organization for Migration (2006) largely defines remittances as the monetary flows connected to migration, that is, cash transfers by migrants or immigrants living abroad to a relation in their home countries. (International Labour Organization, 2020) also defines remittance as part of migrant workers' income remitted back from their employment countries to their countries of origin.

2.1.2. Balance of Payment
According to Irmiya, Irmiya and Odumu, (2023) [18] "the BOP is a technique of itemizing payments and receipts in a country's transaction with other countries". Cohen sees the balance of payments as an instrument which shows a county's trading positions, variations in its net position as a foreign borrower or lender as well as changes in its official reserve holdings with other countries of the world.

The balance of payments can be defined as a methodical record of fiscal and financial relations for duration of time-say a year-between a country and other nations. These transactions involve provision of receipts and payments to the rest of the world (Imoisi, 2012). Generally, transactions are classified into credit and debit entries; payments by a non-resident to a country are categorized as credit items while expenses by the country to other countries are classified as debit items. Fundamentally, the foreign sector of an economy is separated into capital and current accounts. The capital account comprises of direct investments and portfolio investment, being its short or long term, and capital transfers, whereas the current account includes all entries of current transactions, which are transactions that involve either of import or export of visible as well as invisible products, they also consist of services and merchandise (Chikamalu & Nwokoye, 2023) [10]. Therefore, a worthwhile BOP position is seen as a current account position that could be an equitable development, debt servicing capability, growth forecasts and also macro-economic variables. To attain external as well as internal stabilities, balance of payments can be funded on a maintainable basis through movement of capital in its net worth on footings that are well-matched with the view that the BOP is associated with other elements in an equilibrium analysis (Ikpe, Ubom & Johnson, 2024) [14].

2.1.3. Linkages between Remittances and Balance of Payment
The literature identifies various channels through which remittances have an impact on economic growth. Remittances promote economic growth by increasing household income (Imouokhome, 2023) [17]. Increasing income creates the opportunity to boost consumer spending, accumulation of assets, promotion of self-employment, and investment in small business. Moreover, emigration and remittances contribute to human capital accumulation (Karagöz, 2019). A positive impact of emigration on growth is more likely in developed countries, which usually have a higher ability to transfer knowledge and skills when emigrants return to the country of origin, or to divert remittances in order to create new opportunities in the private sector. A negative impact of emigration results if the developing countries of origin suffer from brain drain and start to depend on remittances (Owotemu, Ifechi-Fred & Faleti, 2024) [26]. There are some studies that analyze whether the level (measured as remittances-to-GDP ratio) and growth of remittances are related to a higher level of economic growth (Fayissa, 2024) [13].

Remittances promote additional expenditures in the country, and this influences the opportunity to invest more (Giuliano & Ruiz-Arranz, 2025). Remittances are the source of foreign currency, encouraging higher savings and economic growth (Abiola & Ajibola, (2022) [1]. If remittances create a higher demand than the country is able to meet, they also increase imports, which create a variety of goods and services. In this case, it worsens the prosperity of households that do not receive remittances (Mbadiwe & Egesimba, 2023) [22]. The impact of remittances on economic growth is relatively sensitive to country-specific conditions, through which the effects of remittances are differentiated in size and possibly in nature. The impact of remittances depends highly on public policy, controlling the flow of remittances and creating a favourable environment for the use of remittances in productive investment.

2.2. Theoretical Literature
The Portfolio Theory
According to Markowitz (1952), remittances are viewed as a strategy employed by emigrant workers to diversify their savings. This decision to remit is influenced by the risk-return dynamics of assets in both the host and recipient countries. Key determinants of the decision to remit include interest rate differentials on deposit accounts, real estate returns, and inflation rates. Beyond economic factors, the desire to invest may also be motivated by the emigrant worker's aspiration to return home with dignity, leading to a generally positive relationship between remittances and GDP, in contrast to altruistic motivations. The Portfolio Theory, also known as Modern Portfolio Theory (MPT), introduced by economist Harry Markowitz in 1952, is a foundational concept in finance. This theory provides a framework for making investment decisions by optimizing the trade-off between risk and return. Emphasizing diversification, the theory advocates building a diversified portfolio of assets to achieve maximum return for a given level of risk or to minimize risk for a desired level of return.

Diversification, a core principle of the Portfolio Theory, involves investing in various assets such as stocks, bonds, and real estate to spread risk across the portfolio. The efficient frontier, a crucial concept, represents portfolios offering the highest expected return for a given level of risk or the lowest risk for a desired return. Portfolios lying on the efficient frontier are considered optimal due to their superior risk-return trade-off. The theory introduces risk assessment, typically measured by variance or standard deviation, and emphasizes finding an optimal balance that maximizes returns while managing risk effectively. Utility theory, often applied in Portfolio Theory, captures an investor's risk preferences and aids in determining the optimal asset allocation based on risk tolerance and desired returns. The impact of Portfolio Theory on finance and investment management is significant, leading to the development of various investment strategies and tools. Concepts like diversification, risk-return trade-offs, and efficient portfolio construction empower investors to work towards their financial goals while effectively managing risk.

2.3. Empirical Literature
Several studies abound on the relationship between migration, remittance and economic growth.
Ikwuakwu, Onyele, Onyele, (2024) investigated the impact of foreign remittances on economic growth of Nigeria.

Specifically, the study sought to investigate the effect of foreign direct investment (FDI); exchange rate (EXC), inflation (INF), remittances (REM), gross domestic saving (GDS), and consumption (CONS)on nominal gross domestic product (GDP) using annual time series data from 1981–2019. The data analytical technique was Autoregressive Distributed Lag (ARDL) model. The study also revealed that FDI and gross fixed capital formation had a positive and significant effect on economic growth while inflation and exchange rate had a negative and significant effect on economic growth in the long-run. In the short-run, amidst negative and significant effect of remittances, FDI had a positive and significant effect on economic growth while gross fixed capital formation and inflation were found positive but insignificant and exchange rate having a negative and significant effect on economic growth of Nigeria.

Ugwoegbu, Okoro and Obijiaku, (2024) explored the immigration and economic growth of Nigeria: A study of Awka youths, Anambra State. The specific objectives were to examine the relationship between political instability and human development in Nigeria. Also, to ascertain the relationship between asylum seeking and good governance in Nigeria. The study used descriptive survey research design. The target population are 100 youths in Awka South Local Government Area of Anambra State, Nigeria, who were given a structured questionnaire to fill. The method of data analysis was Pearson Product Moment Correlation Coefficient. The empirical literature reveled that there is a statistically significant negative relationship between political instability and human development in Nigeria, with r = -0.648, n = 100 and p value of 0.006 (p<0.05). Hypothesis two showed that there is a statistically significant negative relationship between asylum seeking and good governance in Nigeria, with r = -0.812 n = 100 and p value of 0.000 (p<0.05).

Mbadiwe and Egesimba, (2023) [22] examined the impact of remittances on economic Growth in Nigeria. The specific objectives of the study were to determine impact of remittances (REM) and overseas development assistance (ODA), gross fixed capital formation (GFCF) and exchange rate (EXR) on Economic growth (RGDP) over the period 1986 – 2021. The method of the data analysis was error correction model (ECM). The ECM result reveals that the errors from the short run to the long run are corrected at the adjustment speed of 46.10% yearly. REM and GFCF have a positive and significant impact on RGDP in the long run while EXR have a negative and significant impact on RGDP in the long run; ODA has no significant impact on growth. Also, all the variables do not confirm the short run impact on growth. The study however concluded that remittances significantly enhance economic growth in Nigeria within the period of study.

Imouokhome, (2023) [17] examined the impact of migration and remittances on economic growth in Nigeria. The specific objectives of the study were to determine impact of remittance, trade openness, foreign direct investment, government expenditure, capital formation on economic growth. The method of data analysis was Autoregressive distributive Lag model. The short run result was presented was evident that remittance has a positive and statistically impact on economic growth under the period of study. The long run estimates reveal that government spending has a positive and significant impact on economic growth. Moreover, it was deduced from the regression result conducted that trade openness and foreign direct investment has a positive impact on economic growth under the period of study. There was found a uni direction between the two variables. It is revealed that remittances does not cause changes in economic growth under the period of study.

Abiola and Ajibola, (2022) [1] investigated the contributions of foreign remittances on economic growth in Nigeria. The specific objectives of the study were to identify the effect of migrants remittance, workers remittance, gross fixed capital formation, foreign aids, trade openness on economics growth from 1980 to 2016. The method of data analysis was Vector error correction modelling (VECM) technique. The two components of remittances performed differently. While the Migrants remittance component exhibits a long run positive, statistically significant relationship with economic growth, the other component i.e Workers Remittance has a negative statistically significant impact in the long run, short run relationship was also established among the variables as the ECM term was negative and statistically significant. The results showed a unidirectional causality from GDP per capita to Migrants remittances while no causality was found between workers' remittances and gross domestic product per capita.

2.4. Gap in Literature
There exist research gap between this study and past researches. The research gap covers subject gap, gap on geographical location of the study, gap on the variables and contents of the study.

Subject gap: The subject matter of this work and some reviewed empirical studies has some differences. There are limited studies on impact of migration and remittance on economic growth in Nigeria over the period of 1990 - 2024. The study is geared to bridge the time gap in literature.

Gap on geographical location of the study: This work covers international migration and diaspora remittance in Nigeria. None of the past studies have done on diaspora remittance as mentioned and most of the past studies were done outside Nigeria.

Gap on the variables and contents of the study: The variables used in this study includes proxies for diaspora remittance namely: diaspora remittance, trade openness and exchange rate (for independent variable) while the following are proxy for balance of payment namely: value of balance of payment (for dependent variable).

3. Methodology
This study adopted ex post-facto research design. These variables consist of value of balance of payment (BOP), diaspora remittance (REM), trade openness (TRADE) and exchange rate (EXCH) for the period of 1990 to 2024 as defined in our model specification. All the variables were sourced from Central Bank of Nigeria's (CBN) statistical bulletin for various years and on-line World Bank Data indicators. The pre-estimation statistics includes descriptive statistics, Correlation Matrix of the Variables, Augmented Dickey-Fuller Unit Root test statistic, Johansen Co-integration test. The estimation technique includes Dynamic Ordinary least square (DOLS).

3.1. Model Specification for the Study

$$BOP = f (REM, TRADE, EXCH) \qquad (3.1)$$

Where BOP is balance of payment, REM is diaspora remittance, TRADE is trade openness and EXCH is exchange rate. In a linear function, it is represented as follows:

$$RGDP = \beta_0 + \beta_1 REMt + \beta_2 TRADEt – \beta_3 EXCH + \mu t \qquad (3.2)$$

Where: $\beta 0$ = Constant term, β_1 to β_6 = Regression coefficient, μt = Error Term and t is the period. To reduce the outliers among the variables, all variables will be expressed in logarithmic form.

$$LogBOP = \beta_0 + \beta_1 REMt + \beta_4 LogTRADEt - \beta_5 LogEXCH + \mu t \qquad (3.3)$$

Where: $\beta 0$ = Constant term, β_1 to β_6 = Regression coefficient, Ut = Error Term and t is the period.

4. Descriptive Statistics of the Variables

	BOP	REM	TRADE	EXCHR
Mean	1065879.	141248.1	2226109.	67.95102
Median	1166001.	137900.0	1188970.	23.86438
Maximum	2133114.	369369.0	6500024.	157.4987
Minimum	47051.10	13030.00	7502.500	8.038285
Std. Dev.	752808.8	104878.9	2513169.	57.10695
Skewness	0.034863	0.576732	0.647425	0.392198
Kurtosis	1.393622	2.445256	1.687051	1.377838
Jarque-Bera	3.770246	2.389074	4.959023	4.734753
Probability	0.151810	0.302844	0.083784	0.093726
Sum	37305768	4943683.	77913825	2378.286
Sum Sq. Dev.	1.93E+13	3.74E+11	2.15E+14	110880.9
Observations	35	35	35	35

Source: Author's computation from E-view 9.

The table shows descriptive statistics of the variables. In the model established in the study, there is one dependent variable and five independent variables. The mean of value of balance of payment (BOP) was 1065879.0, the median was 1166001.1, maximum was 2133114.9, minimum was 47051.10 and sum of the variable was 37305768.45 respectively. The mean of diaspora remittance (REM) was 141248.1, the median was 137900.0, maximum was 369369.0, minimum was 13030.00 and sum of the variable was 4943683.0 respectively. The mean of trade openness (TRADE) was 2226109.0, the median was 1188970.00, maximum was 6500024.4000, minimum was 7502.500, and sum of the variable was 77913825.8 respectively. The mean of and exchange rate (EXCH) was 67.95102, the median was 23.86438, maximum was 157.4987, minimum was 8.038285, and sum of the variable was 2378.286 respectively.

4.1. Unit Root Test using Augmented Dickey-Fuller Test

Table 1: Results of Stationarity (unit root) Test.

Variables	Variables Full Meaning	ADF- Statistics	Critical Value	Lag Value	Remark
BOP	Balance of Payment	-4.868711	5% level = -2.948404	0	1(0)
REM	Diaspora Remittance	-3.596637	5% level = -2.948404	0	1(0)
TRADE	Trade openness	-5.120232	5% level = -2.948404	0	1(1)
EXCH	Exchange Rate	-6.210462	5% level = -2.948404	0	1(1)

Source: Author's computation from E-view 9.

In the table 4.1, the variables that were tested with unit root are shown, the values for Augmented Dickey Fuller (ADF) statistics was presented, the lag level of each variable was identified. The variable value of balance of payment (BOP) passed through Unit Root analysis at level and lag 0, augmented dickey Fuller statistic was -4.868711 while the Mackinnon 5 percent critical value was -2.948404 hence it was stationary at level. The variable diaspora remittance (REM) was stationary at level and lag 0; its augmented dickey Fuller statistic was -3.596637 while the Mackinnon 5 percent critical value was -2.951125. The variable trade openness (TRADE) was stationary at first difference and lag 0; its augmented dickey Fuller statistic was -5.120232 while the Mackinnon 5 percent critical value was -2.951125. The variable banks interest rate (PLR) was stationary at first difference and lag 0; its augmented dickey Fuller statistic was -6.866837 while the Mackinnon 5 percent critical value was -2.951125. The variable and exchange rate (EXCH) was stationary at first difference and lag 0; its augmented dickey Fuller statistic was -6.210462 while the Mackinnon 5 percent critical value was -2.951125. It is now referable to use auto-regressive distributed lag model to estimate the parameters.

4.2. Correlation Matrix of the Variables

Table 2: Result of Correlation Matrix

	BOP	REM	TRADE	EXCHR
BOP	1	0.7699	0.4152	0.3483
NMG	0.6826	0.7894	0.0395	0.6202
IMG	0.8121	0.5050	0.5780	0.0206
REM	0.7699	1	0.1726	0.5093
TRADE	0.4152	0.1726	1	-0.3449
EXCHR	0.3483	0.5093	-0.3449	1

Source: Author's computation from E-view 9.

This correlation matrix presents a table showing correlation coefficients between sets of variables. Each random variable (X_i) in the table is correlated with each of the other values in the table (X_j). This result of correlation matrix helps to identify which pairs of variables have the highest correlation. This test is to detect whether exact or perfect relationship exist among explanatory variables (multicollinearity). The balance of payment (BOP) and diaspora remittance (REM) have no linear relationship between the two variables (0.7699). The balance of payment (BOP) and trade openness (TRADE) have no linear relationship between the two variables (0.4152). The balance of payment (BOP) and exchange rate (EXCH) have no linear relationship between the two variables (0.3483). This test presented clear understanding on the assumption of ordinary least square that there is no perfect or exact linear relationship among explanatory variables. The result of correlation matrix showed that every explanatory variable in the study is linearly independent of each other.

4.3. Johansen Co-integration Test
Ho = There is no co-integration (no long run relationship among Variable)

Table 3: Co-integration Test Results

Date: 04/08/25 Time: 10:32				
Sample (adjusted): 1992 2024				
Included observations: 33 after adjustments				
Trend assumption: Linear deterministic trend				
Series: BOP REM TRADE EXCHR				
Lags interval (in first differences): 1 to 1				
Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		**Trace**	**0.05**	
No. of CE(s)	**Eigenvalue**	**Statistic**	**Critical Value**	**Prob.****
None *	0.856674	129.8596	95.75366	0.0000
At most 1	0.582210	65.75276	60.81889	0.0000
At most 2	0.517371	36.95112	27.85613	0.0000
At most 3	0.179569	12.91041	29.79707	0.8956
At most 4	0.120727	6.378878	15.49471	0.6507
At most 5	0.062595	2.133104	3.841466	0.1441
Trace test indicates 3 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

Source: Author's computation from E-view 9.

The co-integration results in table 4.2.1 for the model (BOP, REM, TRADE and EXCH) reveals that both trace test and the Max-eigenvalue test indicates 3 co-integrating equation(s) at the 5 percent level of significance. We therefore, reject the null hypothesis of there is no co-integration amongst the variables and accept the alternative hypothesis that states there is co-integration amongst the variables.

4.4. Estimation of Regression Model
Empirical Results of the Dynamic Ordinary Least Square Model

Dependent Variable: BOP				
Method: Dynamic Least Squares (DOLS)				
Date: 04/08/25 Time: 10:40				
Sample (adjusted): 1992 2023				
Included observations: 32 after adjustments				
Cointegrating equation deterministics: C				
Fixed leads and lags specification (lead=1, lag=1)				
Long-run variance estimate (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
REM	0.607804	0.078582	7.734610	0.0000
TRADE	2.708191	0.526516	5.143608	0.0003
EXCHR	-6484.480	807.0023	-8.035268	0.0000
C	122254.0	40882.44	2.990378	0.0123
R-squared	0.989297	Mean dependent var		1150967.
Adjusted R-squared	0.969836	S.D. dependent var		729855.1
S.E. of regression	126758.8	Sum squared resid		1.77E+11
Long-run variance	7.65E+09			

Source: Author's computation from E-view 9.

The Dynamic ordinary least square method (DOLS) was carried out to examine parameters estimates. In testing this hypothesis, diaspora remittance (REM), trade openness (TRADE) and exchange rate (EXCH) were regressed against balance of payment (BOP). The result of the regression analysis represents the model for investigating impact of diaspora remittance on balance of payment in Nigeria. The empirical result shows that the coefficient of diaspora remittance (REM) has positive and significant impact on balance of payment (BOP) (t-statistics; 7.7346; P-value; 0.0000 < Sig-value: 0.005). The empirical result shows that

the coefficient of trade openness (TRADE) has positive and significant impact on balance of payment (BOP) (t-statistics; 5.1443; P-value; 0.0003 < Sig-value: 0.005) The empirical result shows that the coefficient of exchange rate (EXCH) has negative and significant impact on balance of payment (BOP) (t-statistics; -8.0352; P-value; 0.0000 > Sig-value: 0.005).

4.5. Granger Causality Test Result
The essence of causality analysis, using the Granger causality test, is to ascertain whether a causal relationship exists between two variables of interest.

Table 4.7.1: Result of Causality Test

Pairwise Granger Causality Tests			
Date: 04/08/25 Time: 13:17			
Sample: 1990 2024			
Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Prob.
REM does not Granger Cause BOP	33	4.62766	0.0002
BOP does not Granger Cause REM		6.21261	0.0008
TRADE does not Granger Cause BOP	33	2.39954	0.1092
BOP does not Granger Cause TRADE		1.46976	0.2472
EXCHR does not Granger Cause BOP	33	1.67070	0.2063
BOP does not Granger Cause EXCHR		0.96175	0.3945

Source: Author's Computation using E-View 9

Evaluating the results in table 4.6, based on the decision rule, The result of pairwise granger causality test showed that diaspora remittance (REM) does granger cause balance of payment (BOP) (F-statistics; 4.6276; P-value; 0.0002 > Sig-value: 0.005) while BOP granger does cause diaspora remittance (REM) (F-statistics; 6.2126; P-value; 0.5611 > Sig-value: 0.0008). The result of pairwise granger causality test showed that trade openness (TRADE) does not granger cause balance of payment (BOP) (F-statistics; 2.399; P-value; 0.1092 > Sig-value: 0.005) while BOP granger does not cause trade openness (TRADE) (F-statistics; 1.4697; P-value; 0.2472 > Sig-value: 0.005). The result of pairwise granger causality test showed that exchange rate (EXCH) does not

granger cause balance of payment (BOP) (F-statistics; 1.6770; P-value; 0.5611 > Sig-value: 0.005) while BOP granger does not cause exchange rate (EXCH) (F-statistics; 0.9617; P-value; 0.3945 > Sig-value: 0.005). In summary, the result showed that there is bilateral causality relationship between diaspora remittance and balance of payment in Nigeria (F-statistics; 6.2126; P-value; 0.5611 > Sig-value: 0.0008).

4.6. Test of Hypotheses
The results for the various hypotheses testing are presented in the section.

4.6.1. Test of Hypothesis one
Test of Hypothesis One
H$_{O2}$ Remittance has no significant impact on economic growth in Nigeria.
In testing this hypothesis, diaspora remittance (REM) is regressed against balance of payment (BOP). The empirical result shows that the coefficient of diaspora remittance (REM) has positive and significant impact on balance of payment (BOP) (t-statistics; 7.7346; P-value; 0.0000 < Sig-value: 0.005).

4.6.2. Test of Hypothesis Two
H$_{03}$ There is no significant direction of causality relationship between diaspora remittance and balance of payment in Nigeria.
In testing this hypothesis, the result of pairwise granger causality test showed that diaspora remittance (REM) does granger cause balance of payment (BOP) (F-statistics; 4.6276; P-value; 0.0002 > Sig-value: 0.005) while BOP granger does cause diaspora remittance (REM) (F-statistics; 6.2126; P-value; 0.5611 > Sig-value: 0.0008). In summary, the result showed that there is bilateral causality relationship between diaspora remittance and balance of payment in Nigeria (F-statistics; 6.2126; P-value; 0.5611 > Sig-value: 0.0008).

4.6.3. Discussion of the Results
Impact of diaspora remittance on balance of payment in Nigeria.
It was observed from the hypothesis tested that diaspora remittance has positive and significant impact on balance of payment (t-statistics; 7.7346; P-value; 0.0000 < Sig-value: 0.005). A change in diaspora remittance result 60 percent positive and direct impact on balance of payment in Nigeria. The finding of this study was in line with study of Ikwuakwu, Onyele, Onyele, (2024) that investigated the impact of foreign remittances on economic growth of Nigeria. Specifically, the study sought to investigate the effect of foreign direct investment (FDI); exchange rate (EXC), inflation (INF), remittances (REM), gross domestic saving (GDS), and consumption (CONS)on nominal gross domestic product (GDP) using annual time series data from 1981–2019. The data analytical technique was Autoregressive Distributed Lag (ARDL) model. The study also revealed that FDI and gross fixed capital formation had a positive and significant effect on economic growth while inflation and exchange rate had a negative and significant effect on economic growth in the long-run. In the short-run, amidst negative and significant effect of remittances, FDI had a positive and significant effect on economic growth while gross fixed capital formation and inflation were found positive but insignificant and exchange rate having a negative and significant effect on economic growth of Nigeria.

Causality relationship between migration and economic growth in Nigeria.
The result of pairwise granger causality test showed that there is bilateral causality relationship between diaspora remittance and balance of payment in Nigeria (F-statistics; 6.2126; P-value; 0.5611 > Sig-value: 0.0008). The finding of this study was not in line with the study of Ikwuakwu, Onyele, Onyele, (2024) that investigated the impact of foreign remittances on economic growth of Nigeria. Specifically, the study sought to investigate the effect of foreign direct investment (FDI); exchange rate (EXC), inflation (INF), remittances (REM), gross domestic saving (GDS), and consumption (CONS)on nominal gross domestic product (GDP) using annual time series data from 1981–2019. The data analytical technique was Autoregressive Distributed Lag (ARDL) model. The study also revealed that FDI and gross fixed capital formation had a positive and significant effect on economic growth while inflation and exchange rate had a negative and significant effect on economic growth in the long-run.

5. Summary of the Findings
The following are the major findings of the study:
1. The empirical result shows that diaspora remittance has positive and significant impact on balance of payment (t-statistics; 7.7346; P-value; 0.0000 < Sig-value: 0.005). A change in diaspora remittance result 60 percent positive and direct impact on balance of payment in Nigeria.
2. The result of pairwise granger causality test showed that there is bilateral causality relationship between diaspora remittance and balance of payment in Nigeria (F-statistics; 6.2126; P-value; 0.5611 > Sig-value: 0.0008).

6. Conclusion
This study concluded that diaspora remittance has positive and significant impact on balance of payment in Nigeria. A change in diaspora remittance result 60 percent positive and direct impact on balance of payment in Nigeria. Diaspora remittances have been taken to be an important source of development finance especially, for developing countries contingent to the way in which the remittances are utilized. However, it was discovered that withdrawal from the circular flow of income inform of national savings can affect the development of human capital negatively if not directed to human capital development programs like educational sector, health sector and skill acquisition as the misuse is capable of increasing the low standard migration level which in turn will bring about low remittances.

7. Recommendations of the Study
Based on the findings of this study, the following recommendations were made.
i. Nigeria government should implement policies encouraging the prudent use of funds received through remittances, directing them into productive investments. This strategy can stimulate increased inflow of remittances into the country. Nigerian government should strive to establish more stable policy measures, enhancing the attractiveness of the country for remittance inflows.
ii. Policymakers should focus on initiatives that simplify and streamline the process of remittance transfers. This includes reducing transaction fees, simplifying documentation requirements, and collaborating with financial institutions to enhance formal remittance channels.

8. References
1. Abiola ML, Ajibola AA. Remittances and the growth of the Nigerian economy. Int J Res Innov Soc Sci. 2022;8(12):24-34.
2. Adeagbo O, Ayansola OA. Impact of remittances on development in Nigeria: challenges and prospects. J Soc Sci. 2024;5(3):311-318.
3. Adeagbo MO. Diaspora remittances and human capital development in Nigeria. Int J Econ Dev Res Invest. 2024;14(1):23-31.

4. Adeseye A. The effect of migrants remittance on economy growth in Nigeria: an empirical study. Open J Political Sci. 2021;11:99-122.
5. Adewumi OA, Obansa J, Oluwatosin O, Nsonwu MC. Impact of remittance on financial sector growth in Nigeria: an econometrics approach. [Journal name not fully specified]. 2024;8(4):101-129.
6. Anetor FO. Remittance and economic growth nexus in Nigeria: do financial sector development play a critical role? Int J Manag Econ Soc Sci. 2019;8(2):116-135.
7. Ari OU. The impact of remittances on economic growth in developing countries: empirical evidence from Turkey. In: Proceedings of the 8th International Conference on Culture and Civilization; [location and dates not specified]. [Place of publication not specified]: [Publisher not specified]; 2020. p. 54-62.
8. Awara FE, Ihuoma CE. Macroeconomic impact of remittances: evidence from Nigeria. J Econ Allied Res. 2023;8(2):220-231.
9. Buhari D, Muhils C, Osman D. The nexus between income inequality, international remittances and economic growth in Turkey. CEA J Econ. 2018:5-16.
10. Chikamalu UM, Nwokoye ES. International oil price volatility and Nigeria's balance of payments. J Int Econ Relat Dev Econ. 2023;3(3):789-792.
11. Chowdhury SR. Remittances and economic growth determinants in low, lower middle, and upper middle-income countries: a comparative study. Charleston (IL): Department of Economics, Eastern Illinois University; 2020.
12. Dilshad WB. Impact of workers' remittances on economic growth: an empirical study of Pakistan's economy. Int J Bus Manag. 2023;8(24):126-131.
13. Fayissa A. The impact of remittances on economic growth and development in Africa. Department of Economics and Finance Working Paper Series. 2024.
14. Giuliano P, Ruiz-Arranz M. Remittances, financial development, and growth. IMF Working Papers. 2005;WP/05/234.
15. Ikpe ME, Ubom AU, Johnson G. Effect of exchange rate volatility on international trade in Nigeria. Int J Res Finance Manag. 2024;7(2):441-451.
16. Ikwuagwu EB, Onyele KO, Onyele CO. The effect of remittances on economic growth of Nigeria. Rev Socio-Econ Perspect. 2024;9(1):121-134.
17. Imouokhome PA. Impact of migration and remittances on economic growth in Nigeria. Int J Res Innov Soc Sci. 2023;7(8):569-567.
18. Irmiya SR, Irmiya AP, Odumu VA. Effect of exchange rate fluctuations on balance of payments in Nigeria. Afr J Manag Bus Res. 2023;10(1):34-41.
19. Javid M, Arif U, Qayyum A. Impact of remittances on economic growth and poverty. Acad Res Int. 2022;2(1):433-447.
20. Karagöz K. Workers' remittances and economic growth: evidence from Turkey. J Yaşar Univ. 2009;4(13):1891-1908.
21. Khan MK, Teng JZ, Khan MI. The effect of migrant remittances on economic growth: an ARDL approach. Eng Econ. 2019;30(4):434-441.
22. Mbadiwe MM, Egesimba CS. Remittances and economic growth: a case study of Nigeria. Int J Entrep Dev Educ Sci Res. 2023;2(2):34-43.
23. Nangih E, Diepreye B. Effect of diaspora remittances on Nigeria's per capita income and gross domestic product. World J Finance Invest Res. 2024;8(5):67-75.
24. Nangih E, Nwineewii D. Diaspora remittances and Nigeria's human development index. Int J Soc Sci Manag Res. 2023;10(11):230-241.
25. Olayungbo DO, Quadri A. Remittances, financial development and economic growth in sub-Saharan African countries: evidence from a PMG-ARDL approach. Financ Innov. 2019;5(9):1-25.
26. Owotemu AE, Ifechi-Fred N, Faleti A. Contributions of diaspora remittances to economic growth & development in Nigeria: a housing finance & infrastructure perspective 2000-2023. J Serv Sci Manag. 2024;17:321-344.

How to Cite This Article

Creative Commons (CC) License