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Remittance and Poverty Reduction in Nigeria: Further Evidence from Nigeria

Amaka, C. Mbaeri*, Chris U. Kalu & Machi, I. Okoye

Department of Economics, Nnamdi Azikiwe University, Awka
** Corresponding Author*

Abstract

Nigeria is the sixth highest recipient of remittances globally, and only second to Egypt in Africa. Yet, successive World Bank Annual Economic reports continue to rank the country among the poorest in the world. This paper examined the impact of remittances on poverty reduction in Nigeria from 1986-2021 using the error correction model (ECM) analytical technique. Based on the neo-classical theory of poverty and migration, the independent variables used in this paper include remittance inflow, real gross domestic product per capita, foreign direct investment, financial market access, trade openness, and inflation rate. Data for this paper were sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin of various issues, and the World Bank Development Indicator (WDI). The paper showed that a unit increase in remittances results to 0.1138 unit decrease in poverty rate. Also, real gross domestic product per capita, foreign direct investment and financial market access, all have negative relationships with poverty rate, decreasing poverty rate by 41.39, 0.399 and 0.0312 units respectively. Meanwhile, inflation has a negative relationship with poverty rate, while trade openness has a positive relationship with poverty rate. The result also showed that the error correction model suggested an adjustment rate of 7.57% of the model to long-run equilibrium. The paper recommended among others, the use of our consular offices abroad to regularize the resident status of Nigerian illegal migrants and channeling remittances of such migrants formally to Nigeria.

Keywords: *Remittance, poverty reduction, error correction model, migrant, Nigeria*

JEL Codes: F24, C01, F22, C82

1.Introduction

A remittance is a non-commercial transfer of money by a foreign worker, a member of a diaspora community, or a citizen with familiar ties abroad, for household income in their home country (Al-Assaf & Almalki, 2014). Money sent home by migrants competes with international aids as one of the largest financial inflows to developing countries, as workers' remittances are a significant part of international capital flows, especially with regard to labour exporting countries (Vargas – Silva, 2018). According to World Bank (2021), overall global remittance grew 10 percent to US$689 billion, including US$528 billion to developing countries in 2018, and 3.7 percent to US$715 billion in 2019, including US$549 billion to developing nations. Due to its large diaspora

and oversees expatriates, India consecutively remains the top receiver of remittance globally with a total of US$87 billion in 2020. Other top recipients in 2020 were US$67 billion to China, US$34 billion each to Philippines and Mexico, US$26 billion to Egypt and US$25 billion to Nigeria (World Bank, 2021).

It is noteworthy that over the years, Nigeria has remained outstanding in terms of inflows of remittances at both regional and global levels. From both theoretical and empirical views, remittances have been identified to have impacts on the economy through their effects on growth and development. It provides opportunities for poverty reduction through increase in recipients' income and standard of living (Gupta *et al*., 2009). In a similar study, Iheke (2012) averred that international remittances are very important for reductions in poverty and inequality as well as overall development. Other channels through which remittances influence macroeconomic outcomes are through their impacts on economy wide aggregate, especially output, exchange rate, investment, human capital amongst others (Gupta *et al*., 2009). Increased globalization has contributed immensely to the increasing rate of integration of the world economy, resulting in countless number of financial flows, trade in goods and services, movement in persons and various forms of technology transfers across the world (Taiwo, 2007).

In the 1950s and 60s, Nigerians migrating abroad did so for academic pursuits and to acquire skills that prepared them for important roles in the country on their attainment of independence. However, from the 80s to date, Nigerians migrates abroad due mainly to political and economic reasons. Adedokun (2003) observed that there has been a remarkable increase in emigration to Europe, North America, the Middle East and South Africa from the 1980s due to economic downturn, introduction of liberalization measures and the emergence of oppressive military regimes. A myriad of professionals, especially scientists, academics and medical personnel have emigrated, mainly to Western Europe, the United States and Persian Gulf States. At the same time, unskilled Nigerians with little education have gone abroad to work as street cleaners, security guards, taxi drivers and factory hands (Chukwuone, Amaechi, Iyoko, Enebeli-Uzor & Okpukpara, 2007).

Hnatkovska and Loayza (2003) and Cheimi *et al*. (2009) argued that constant inflows of remittances reduced macroeconomic shocks, especially volatility in output, which enhances rapid growth of the economy. More so, Ratha *et al*. (2009) remarked that international remittances are important for the development of the financial sector which help in reducing credit constraints for investment purposes and in turn stimulates rapid economic growth. Furthermore, remittances inflows also cause the domestic currency of the recipient country to appreciate. This appreciation in the exchange rate was perceived by Acosta et al. (2007) as growth – retarding. Ewubare and Okpoi (2018) observed a mixed-effects of inward and outward remittances on poverty reduction in Nigeria in the short-run. While inward remittances were significant in the short-run, outward remittances were not. In the long-run, inward remittances stimulated poverty while outward remittances reduced poverty incidence. Ewubare and Okpoi (2018) further opined that the net effects of remittances on human capital as identified in existing literature are mixed. On one hand, remittances are expected to boost human capital formation through the investment of the remitted funds on education. This tends to increase employment opportunities and in turn reduce poverty.

However, skill shortages and fall in net stock of human capital on the other hand, are the obvious negative outcomes of labour emigration in the remittance recipient countries.

It is worrisome that Nigeria still faces tremendous challenges in addressing the problems of poverty and inequality as well as stimulating the growth potentials of the domestic economy despite the huge income remitted to the country by her nationals abroad. It should be noted that the macroeconomic impacts of remittances are mostly captured through economic growth and socioeconomic indicators, especially poverty reduction and inequality amongst others. While these macroeconomic impacts of remittances have received considerable attention in other countries, the effects of remittances at various levels in Nigeria seem not to be adequately explored even as numerous reports and empirical evidence indicates that Nigeria surpasses other countries in sub-Saharan Africa in terms of inflows of remittances. In the light of the foregoing, this study seeks to examine how remittances inflow and other traditional economic indicators such as real gross domestic product per capita, foreign direct investment, financial market access, trade openness, and inflation rate, affects poverty in Nigeria. Therefore, the broad objective of this paper is to examine the impact of remittance on poverty reduction in Nigeria between the period 1986 to 2021 using the error correction model (ECM).

2. Empirical Literature Review

This section reviews the extant empirical studies on the relationship between remittance and poverty reduction across geographical boundaries. The essence is to showcase the various empirical attempts on the subject of remittance and poverty reduction. Quartey (2006) studied the impact of migrant remittances on household welfare in Ghana. The study adopted the random effects GLS methodology and showed that shocks to household welfare were minimized by migrant remittances, with a positive relationship between migrant remittances and household welfare. The effect of remittances on poverty and inequality in Vietnam was investigated by Viet (2008). The study adopted the fixed-effects estimation technique on a sample of 4,008 households and found that remittances decreased poverty for remittance receiving households, but increased inequality. Assaminew *et al.* (2011) examined the impact of migration and remittances on poverty in Ethiopia from 1971 to 2009 in the vector autoregressive (VAR) model from 1,490 respondents, using the binary outcome model. Findings from the study showed that international remittances had a significant negative effect on poverty in urban households. Fonta *et al*. (2011) critically explored the link between remittance inflows, poverty and income inequality in Nigeria. The study employed poverty and Gini decomposable technique for the empirical analysis, the study suggested evidence to support the claim that remittances and household poverty are indirectly related in the sampled geopolitical zones. Additionally, the result of the Gini decomposition revealed that increase in remittance produces more robust result in urban than in rural area with regard to reduction in inequality.

Javed *et al*. (2015) studied the impact of remittances inflow on the welfare of 400 households in Toba Tek Singh district of Punjab, Pakistan. The study adopted the propensity score matching method and found statistically significant impact of remittances on the expenditures of migrant households on food and non-food items, thus enhancing the welfare of remittance receiving

households. This result was found to be significantly different for non-remittance receiving households. Okodna *et al*. (2015) appraised the connection between remittance expenditure patterns and human development implications in migrant sending communities of Nigeria. The study specifically investigated the extent to which human development outcomes in migrant sending communities of Nigeria is related with remittance expenditure patterns in the economy. Result from World Bank migration and Remittances Household Surveys for the period 2009/2010 indicated that the remittance expenditure patterns across the economy seem not to vary for the period investigated. Salman (2006) investigated the welfare enhancing effect of migrant remittances among households in Nigeria. The study, adopting the propensity score matching (PSM), endogenous switching probit (ESP), and treatment-effects models (TEM) found that remittances had a positive impact on economic welfare. Specifically, remittance receiving households had a little over 92 percent more per capita expenditure than non-receiving households. Akanle and Adesina (2017) also examined the welfare effects of remittances on households in Nigeria. Households for the study were divided up into remittances receiving households and non-remittance receiving households. A total of 1,115 household members were sampled for the study from 2015 and 2016. Using the ordinary least square(OLS) estimation method, the study showed that there was a significant positive relationship between remittances and welfare.

The examination of welfare effect of remittances and migration on 4,157 households in Vietnam was done by Cuong and Linh (2017). Adopting the fixed-effects regression, the study found that international remittances had a positive effect on household income and expenditure. More specifically, remittances received improved the per capita income and expenditure of receiving households and the overall welfare of the households. Furthermore, Imai *et al*. (2017) investigated the impact of remittances on growth and poverty alleviation in Asia. The study adopted the Generalized Method of Moment (GMM) method of Instrumental Variables (IV) in the study. Findings indicated that remittances significantly reduced poverty and promoted economic growth. Kangmennaang *et al* (2018) studied the effect of migration and remittances on the welfare of 1,000 households in Northern and Central Malawi. Using the propensity score matching (PSM), with the augmented inverse probability weighting (AIPW) as the matching tool, the study found that households where migrant members existed had less chances of being food insecure, recorded increases in household assets and improvement in household welfare. Akhter and Islam (2019) studied the effect of migration and migrant remittances on poverty in Bangladesh. The study was conducted on 8,449 households in 2014 using the propensity score matching and logistic regression techniques. The study found that international remittances exerted a positive and statistically significant effect on poverty in Bangladesh.

Imran *et al*. (2019) studied the impact of foreign remittances on poverty in the province of Pakistan using logistic and instrumental variables (IV) regression. The study covered 36,400 households in the region and revealed that international remittances had a significant negative effect on the incidence and severity of poverty in the study area. Kumar (2019) examined the effects of remittances on poverty and welfare in Bangladesh. The study surveyed 360 households in Cumila district of Bangladesh Adopting the one-way ANOVA, the findings indicated that poverty was less and welfare more in remittance receiving households than non-remittance receiving households.

Buktus *et al.* (2020) evaluated the poverty effect of remittances on seven central and Eastern European (CEE) countries from 2006 to 2015 using the POLS, fixed and random effects and 3SLS estimators. The study found that remittances had a significant negative effect on poverty headcount, poverty depth and poverty risk. In a study on the dynamic effect of remittances on poverty and inequality in Kosovo, Arapi-gjini *et al.* (2020) found that absolute and relative poverty in Kosovo were alleviated by remittances. The study used the propensity score matching and dose-response estimations on a cross-sectional dataset of 8,000 households in 2011.

Some other empirical studies are reviewed based on the method employed and the relationship among the variables used in the studies.

Abdul, Muhammad and Umaima (2010) investigated the impact of remittances on economic growth and poverty, spanning the time frame of 1997 to 2007 in Pakistan. The Auto Regressive Distributed Lag (ARDL) approach was employed in analyzing the model comprising of variables such as; real GDP, poverty, investment, HDI, openness and inequality. The study revealed that economic growth and remittances are positively related; investment and HDI positively affected GDP, while openness showed a negative influence. The study concluded therefore, that there existed a significantly strong relationship between remittances with poverty reduction and economic growth in Pakistan.

Adenutsi (2010) examined the macroeconomic impact of inward international remittances on human-centre development in 15 sub-Saharan African countries. A fixed effect balanced panel data estimation technique was adopted in a time frame of 1987 to 2007. The model included variables such as remittance, investment, human capital, international trade openness, CPI, government expenditure, and time dummy. The study found all the variables to positively influence human development with the SSA countries.

Okodue (2010) studied 21 selected countries of sub-Saharan Africa (SSA). The study employed the system Generalized Method of Moments (GMM) estimation technique within an extended neo-classical growth model framework on a set of three linear dynamic models in order to evaluate the relationship between the growth of output and remittances, remittances and domestic investment, and remittances and external trade balance (proxy by real external balance). The period of the study spanned from 2000 to 2007, and the findings showed that remittances had a significant existing negative impact on output growth, domestic investment, and external trade balance. This implied that remittances were not put to productive uses, it crowded out domestic investment and depressed trade balance in these SSA countries.

Nyeadi, Yidana and Imoro (2014) showed that for remittances to be effective in fostering household welfare and healthcare in developing countries. To determine whether remittances can lead to economic growth, the study set to ascertain what could be the causal relationship between economic growth and remittances in the following remittance-receiving countries: Nigeria, Senegal and Togo. The study used Granger-causality and co-integration test under Vector Auto Regressive framework for the period 1980 to 2012. The study realized that for Nigeria and Senegal, a Unidirectional causal relationship exists, implying that remittances led to economic growth, but

economic growth did not lead to remittances inflow. However, for Togo, there was no causal link between remittances and economic growth.

Beatrice and Samuel (2015) investigated the effect of remittances an economic growth in Kenya from 1993 to 2013, using the Granger causality test and the OLS estimation technique. The variables included in the model are population, investment, openness, enrolment, inflation, net export, government consumption, and remittances. The study found that remittances impacted positively on economic growth, and a bi-directional causal relationship was established between remittances and economic growth. Apart from secondary school enrolment and inflation which were both negatively related with economic growth, others impacted positively and significantly on economic growth.

From the reviewed empirical studies, it is evident that quite a good number of studies have been done on the relationship between remittance and poverty. From these studies, some conclusions can be made: i) There are mixed results; some studies showed positive relationship while some showed negative relationship; ii) Various analytical techniques have been used in investigating the relationship between remittance and poverty, series of policy options were suggested as panacea for reducing poverty through the inflow of remittance. Most significantly, most of the previous studies reviewed are cross country studies with few studies in Nigeria.

This paper is further justified on the basis that the 2030 Agenda for Sustainable Development Goals(SDGs) recognizes that migration is a powerful driver of sustainable development for migrants and their communities. Goal 10 of the Sustainable Development Goals (SDGs) dwells on ease of migration and least cost of remittances. According to target 7 of this goal, migrants brings significant benefits in the form of skills, strengthening the labour force, investment and cultural diversity, and contributes to improving the lives of communities in their countries of origin through the transfer of skills and financial resources. This study examined how funds remitted to Nigeria by her citizens living abroad together with other economic indicators such as real GDP per capita, foreign direct investment, financial market access, trade openness and inflation rate, affects poverty. This is done through the instrumentation of the error correction model (ECM). The inclusion of these variables and the use of ECM to estimate the long run stochastic trend between remittance and poverty in Nigeria is a contribution of this paper to empirical and theoretical knowledge. The next section presents the research design.

3. Theoretical Framework, Model Specification and Data Sources

The theoretical framework of this paper is derived from the neo-classical theory of poverty, as it relates to migrant remittances and inflows. Neo-classical theory stresses the role of unequal initial endowment of talents, skills, and capital in generating poverty within a market-based competitive economic system. A strand of these focuses on individual choices in relation to education, training and mobility in explaining differences in incomes. Mobility entails migration from one economic environment to the other in search of better conditions and maximizing net economic return on human capital. Migrants are perceived as agents of change, innovators and investors (Lucas and Stark, 1985). The general expectation is that the flow of remittances, experience, skills and

knowledge of migrants would promote economic development as they are expected to invest large sums of money in enterprises in their country of origin. According to Sibel and Andrea (2006), remittances whether invested or consumed, generate positive multiplier effects by stimulating various sectors of the economy.

This paper adopted and modified the empirical work of Acosta *et al*. (2008) which examined the remittance poverty nexus. Acosta *et al*. (2008) posited that since remittances could increase per capita income, ease credit constraints, and compensate for negative shocks in recipient countries that would likely reduce poverty and inequality, boost domestic investment and economic growth. This implies that overtime remittances impact on poverty through the acceleration of gross domestic product affecting the sectoral composition of growth impacts. In this paper, poverty rate is used as a proxy for poverty reduction. The model estimated in this paper is specified as follows:

$$POVR = f(\text{Remittances})$$

However, given that there are other economic factors that affect remittances as earlier identified, we introduce these variables in the following equation thus:

$$POVR = f(REM, RGDPC, FDI, FMA, OPEN, INF)$$

Where: POVR = Poverty rate; REM = Remittance inflow into Nigeria; RGDPC = Real Gross Domestic Product Per Capita; FDI = Foreign direct investment; FMA = Financial market access; OPEN = Trade openness, and INF = Inflation rate.

The Linear form of the model is

$$POVR = a_0 + a_1 LnREM + a_2 LnRGDPC + a_3 LnFDI + a_4 FMA + a_5 OPEN + a_6 INF + Ut$$

Where: Ut is the error term at time t, a_0 to a_6 are the unknown parameters of the model to be estimated. Other variables are defined as follows: Hence, a positive relationship is expected between remittance and poverty; positive relationship between income and poverty , and positive relationship between foreign direct investment and poverty. Meanwhile, financial market access and trade openness is expected to impact positively on remittance and inflation aggravates poverty as it erodes the purchasing power the more.

The analytical technique used for this paper is the error correction model (ECM). It makes it possible to deal with non-stationary data series and separate the long-run and short-run. Procedurally, the data were subjected to stationarity/unit root test, using the Augmented Dickey Fuller (ADF) and Phillip Peron unit root tests to ensure the stationarity of the variables. The co integration test was carried out and 5% level of significance was adopted to guide decisions on these tests. Also to ensure the reliability and stability of the model, the diagnostic and stability tests were carried out.

Table 3.1 presents the descriptions and sources of the variables

Variables	**Description**	**Measurement**	**Sources**
POVR	Poverty rate	Poverty line of $1.90 per day	WDI, 2022
REM	Remittance	Valued in US$, but converted into Naira by multiplying it by the exchange rate	CBN, 2022
RGDPCI	Real GDP per capita	GDP at 2015 constant basic prices divided by the nations population	WDI, 2022
FDI	Foreign direct investment	Valued in US $	CBN, 2022
OPEN	Trade openess	Total value of import and export	WDI, 2022
FMA	Financial Market access	Credit to the private sector	CBN, 2022
INF	Inflation	Measured in rate	CBN, 2022

Source: Authors' compilation(2023)

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4 Result presentation and Analysis

4.1 Unit root Result

Table 1: Summary of Unit Root Test Result

		ADF Test statistics			
Variable		**At Level**	**1st Difference**	**Decision**	**Order of Integration**
POVR/GINI		-1.431530/-2.167502	-3.443603	Stationary at 1st difference	I(1)
LnRGDPC		1.396961	-3.362160	Stationary at 1st difference	I(1)
LnREM		-1.144022	-6.829805	Stationary at 1st difference	I(1)
LnFDI		-1.366728	-7.506180	Stationary at 1st difference	I(1)
FMA		-0.416446	-5.025848	Stationary at 1st difference	I(1)
OPEN		-2.200264	-7.980352	Stationary at 1st difference	I(1)
INF		-2.166070	-5.857673	Stationary at 1st difference	I(1)
Critical Values	1%	*-3.626784*	*-3.626784*		
	5%	*-2.945842*	*-2.945842*		
	10%	*-2.610263*	*-2.611531*		

Source: Researchers' Computation using E-Views 9.0

The unit root test in table 4.1 showed that the variables are stationary at first difference, which implies that variables are integrated of order one, I (1). Based on these results, one can test for the existence of a long-run relationship amongst the variables, i.e. cointegration.

Table 4.2: Johansen Cointegration Test Results: Trace and Max-Eigen Statistics

Trace Statistic					**Max-Eigen Statistic**		
Hypothesized No of CE (S)	**EigenValue**	**Trace statistics**	**5% Critical Value**	**Prob****	**Max-Eigen statistics**	**5% Critical value**	**Prob****
None	0.876107	200.3220	125.6154	0.0000	75.18024	46.23142	0.0000
At Most 1	0.764187	125.1417	95.75366	0.0001	52.00984	40.07757	0.0015
At Most 2	0.652346	73.13189	69.81889	0.0265	38.03574	33.87687	0.0150
At Most 3	0.379795	35.09614	47.85613	0.4430	17.19741	27.58434	0.5630
At Most 4	0.275547	17.89874	29.79707	0.5736	11.60416	21.13162	0.5870

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At Most 5	0.158367	6.294579	15.49471	0.6607	6.206786	14.26460	0.5868
At Most 6	0.002436	0.087793	3.841466	0.7670	0.087793	3.841466	0.7670

Note: **Trace test indicates 3 cointegrating eqn(s) at the 0.05 level

**Max-eigenvalue test indicates 3 cointegrating eqn(s) at the 0.05 level
Source: Researchers' Computation using E-view 9
The result of the Johansen cointegration rank test presented in table 2 shows that the trace statistic and Max-eigen statistic both indicate three (3) Cointegrating equations at the 5% level. The existence of at least 1 co integrating equations is an indication that there exists a long-run relationship (Idowu, Sani & Ibeagha, 2012).

Table 4.3: Error Correction Model Result

Error Correction Model
Method: Least Squares Date: 04/05/2020 Time: 17:10
Sample (adjusted): 1983 2020

Included observations: 35 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.		
C	2.764879	0.582052	4.750224	0.0001		
D(LNRGDPC)	-41.38972	17.83004	-2.321347	0.0281		
D(LNREM)	-0.113848	0.024187	-4.706991	0.0114		
D(LNFDI)	-0.399925	0.542846	-0.736719	0.4676		
D(FMA)	-0.031238	0.249410	-0.125246	0.9013		
D(OPEN)	0.051493	0.046778	1.100791	0.2807		
D(INF)	-0.031582	0.008839	-3.573029	0.0028		
ECM(-1)	-0.075680	0.031049	-2.437444	0.0217	R-squared	0.702703
Adjusted R-squared	0.621922					
F-statistic	7.674420					
Prob(F-statistic)	0.017722					
Durbin-Watson stat	1.870094					

Source: Researcher's Computation using E-View9

The Error Correction model equation is therefore specified as follows:

D(POVR) = 2.765 - 41.389*D(LNRGDPC) - 0.1138*D(LNREM) - 0.399*D(LNFDI) - 0.0312*D(FMA) + 0.0515*D(OPEN) - 0.03158*D(INF) - 0.0757*ECM(-1).

4.2 Discussion of Results

The unit root test showed that the variables are integrated at order 1 i.e. I (1) thereby giving the possibility of co-integration amongst the variables. The first order stationarity of the data means that the statistical properties of the data are constant and do not vary over time hence we ascertain their long run properties using Johansen (1988) co-integration test technique. The results of Trace Statistic and Max-Eigen Statistic tests gave the green light to apply the Error Correction Model (ECM). The cointegration results permits to test and estimate short and long run relationship between variables using the ECM approach which also helps to solve the spurious correlation problem among economic variables. The co-integration test showed that there is a long relationship between remittances and its variables and poverty reduction in Nigeria.

Consequently, the error correction model was estimated which represents the short-run estimates of the model. The result suggested that remittances has a negative and inverse relationship with poverty rate. In effect, a unit increase in remittances will result to 0.1138 units decrease in poverty rate all things being equal. This shows that remittances inflow into Nigeria has a decreasing effect on poverty and is also significant at 5% level. This finding corroborates the findings of Jangwanich (2007), Adams (2004), Anyanwu & Erhijakpor (2009) and Abeng, et al (2011) who in their separate studies found an increase in the rate at which remittances decreases poverty in Nigeria. This revelation goes to explain the fact posited by Olowa (2013) that Nigerians living outside the country have the highest remittances in sub-saharan Africa and as such the remittances contributes more in reducing poverty than government poverty reduction strategies over the years.

Going further, the short run model reveals that Real GDP per capita, foreign direct investment and financial market access all have negative relationships with poverty rate decreasing poverty rate by 41.39, 0.399 and 0.0312 units respectively. However, only real GDP per capita is significant at 5% meaning that real GDP per capita significantly decreases poverty rate in Nigeria for the period under review. This result is indicative of the fact that increased remittances raise income of the people, increases household consumption and ease capital constraints. The multiplier effect of these activities is that the non-remittances receiving households would tend to benefit by expenditure and consumption. This would indirectly reduce poverty even for poor families who are not direct beneficiaries of remittances. Inflation on the other hand has a decreasing effect on poverty rate with a negative coefficient of -0.0315 and is statistically significant at 5% level; this means that with increasing inflation rate in the economy, poverty rate decreases by 0.0315 unit which is far from our apriori expectation. However, the reason for this can be attributed to the increase in cash flow in the economy occasioned by increased money supply due to huge remittances which increases household income.

The coefficient of trade openness which is an important variable in remittances measurement is estimated at 0.05149 meaning that a unit increase in trade openness increases poverty rate by 0.05149 units. This is not supposed to be the case but the result suggests that the ratio of total trade to GDP (trade openness) decreases increases remittances which in turn increases poverty rate. This can be said to be a direct consequence of increased money in circulation. The error correction model coefficient is estimated at -0.07568 which means that the model corrects its previous periods

disequilibrium at a speed of 7.57% annually. What this implies is that given a steady state of increase in remittances by 7.57% annually, poverty rate will experience a decrease in the long run. As a result, the study confirms the effect of remittances in reducing poverty in the long run.

4.3 Post-Estimation Test Results

Table 4.4 shows the post estimation test results which comprised of the Breusch-Godfrey serial correlation test, Durbin Watson test for autocorrelation, Cumulative Sum test, normality test and the Coefficient of determination (R-squared and Adjusted R-squared). These tests are necessary in order to ascertain the statistical robustness and predictive ability of the model. They are summarized as follows:

Table 4.4 : Stability/ Diagnostic Tests

S/N	Test	Probability	Decision
1.	Breusch-Godfrey serial correlation LM test	0.2432	No serial correlation.
2.	Durbin Watson Statistic	1.870094	No Autocorrelation
3.	Breusch-Pagan-Godfrey Heteroscedasticity Test	0.9900	No Heteroscedasticity
4.	CUSUM Test	Within bands of 5% significance level	Stable
5.	Normality (Residual) Test	Skewness: 1.654641 Kurtosis: 7.151152 Jarque-Bera: 41.10080 (prob. 0.0000)	Series are normally distributed.
6.	R-square and Adjusted R-square	0.702703 0.621922	High explanatory coefficient

Source: Extracted from E-Views 9.0 output

The post-estimation tests as presented in table 4 shows that the model is free of serial correlation of the error terms given the p-value of the Breusch-Godfrey Serial Correlation LM test. Also, the Durbin Watson statistic suggests that there is no autocorrelation in the model since the DW value tends towards 2 than to 0. In addition, the Breusch Pagan Godfrey Heteroscadasticity test indicates that the variance or errors are the same over the sample period, as indicated by the p-value. Similarly, the normality test suggests that the Breusch model complied with the normality assumptions as attested by the Jarque-Bera statistic and the p-value.

The cumulative sum (CUSUM) test shows and affirms the stability and suitability of the model for forecasting since the CUSUM line is within the upper and lower bounds 5% critical value lines.

Finally, the R-square value of 0.7027 and the Adjusted R-square of 0.6219 indicate that the explanatory variables (remittances and its indices) accounts for up to 62% and 70% of the

variations in poverty rate in Nigeria based on the model formulated in this research. This gives a very good fit. The summary of the test of hypotheses are presented in Table 5

Table 4.5: Summary of Hypotheses Test

Variables	t-statistics	Prob.	Decision Rule
Remittance	-4.706991	0.0114	Reject Null hypothesis
Per-capita GDP	-2.321347	0.0281	Reject Null hypothesis
Foreign Direct Investment	-0.736719	0.4676	Accept Null hypothesis
Financial Market Access	-0.125246	0.9013	Accept Null hypothesis
Trade Openness	1.100791	0.2807	Accept Null hypothesis
Inflation Rate	-3.573029	0.0028	Reject Null hypothesis

Source: Researchers' Computation using E-View 9 (2023)

The individual test of the variables summarized in table 5 above shows that Remittance has a significant p-value of 0.0114 hence we reject the null hypothesis and conclude that Remittance inflow into Nigeria has significant impact on poverty reduction in Nigeria. Furthermore, Real GDP per capita and inflation rate are statistically significant at 5% level. This means that we reject the null hypothesis and conclude that per-capita GDP and inflation rate have significant impact on poverty level in Nigeria. On the other hand, foreign direct investment, financial market access and trade openness are not statistically significant, therefore, we conclude that foreign direct investment, financial market access and trade openness have no significant impact on poverty reduction in Nigeria.

5.1 Conclusion and Policy Recommendations

Following the analysis of the data, the following conclusions can be inferred from this paper,i) There is an inverse relationship between remittances and poverty rate in Nigeria. A unit increase in remittances results to 0.1138 units decrease in poverty rate, ii) real GDP per capita, foreign direct investment, financial market access and inflation rate all have negative relationship with poverty rate reducing poverty rate by 41.389, 0.399, 0.0312 and 0.0316 unit respectively and error correction model estimated an adjustment rate of 7.57% of the model to long run equilibrium. Thus given a steady state of increase in remittances by 7.57% annually, poverty rate will experience a decrease in the long run. The explanatory variables used in the model jointly impacted on poverty reduction in Nigeria accounting for up to 62% of the changes in poverty rate. Therefore, the paper concluded that remittances inflow into Nigeria have indeed reduced poverty rate and increased household income. The expected impact of per capita GDP and FDI on poverty rate confirms the fact that remittances have had multiplier effect on other economic variables hence the need to further enact policies that will aid the inflow of remittances onto the economy.

5.2 Policy Recommendations

From the findings of this paper, the following policy is recommended:

i) Since remittance contribute immensely to poverty reduction in Nigeria, measures to attract and sustain the inflow of remittances should be put in place. They include using our consular offices abroad to regularize the resident status of Nigerian illegal migrants and receiving and channeling remittance of such migrants through formal remittance channels in their coverage areas.

ii) In addition to the recommendation made in (1) above, there should be creation of diaspora bonds that are projects-specific as well as organizing Nigeria migrants into investment associations or co-operatives by the consular personnel. This will encourage migrants to remit more on a sustainable basis.

iii) The authorities can adopt a deliberate emigration policy that encourages remittances inflow by investing our Sovereign Wealth Fund in labour intensive projects abroad that can equally employ both skilled and unskilled Nigerians. Through this way, the Nigerian employees of such projects and their families who incidentally may engage in other employments in their resident countries will remit more.

iv) The negative relationship exhibited by FMA with poverty rate may be attributed to the quality of the DMBs credits to the private sector; the authorities can change this by exercising stringent supervisory role on banks so that loans will be channeled to projects that add value economic growth and thus poverty reduction.

v) One of the major challenges for policy makers in Nigeria is to motivate senders and recipients of remittances to conduct their money transfer operations through formal financial institutions. In that way, remittances could become formal savings and deposits in financial institutions and, thus have a multiplier effect in the country. This could be addressed by increasing the supply of financial services to both senders and recipients of remittances. Products that could be offered to poor families receiving remittances include deposit and savings accounts, consumer loans, mortgages, life and non-life insurance products, pensions, etc. This would not only deepen the financial system, but more importantly help recipients of remittances improve their living conditions.

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