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Real Output Growth and Migrant Remittances in Nigeria

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Abstract
This study focused on the effects of real output growth on migrant remittances in Nigeria. While real output has alternated between negative and positive growth within the period, diaspora remittances have continued to rise in magnitude and importance as a source of foreign capital in Nigeria. To isolate and reexamine the relationship between them, the study developed and estimated a linear model using data sourced from Central Bank of Nigeria Statistical Bulletin and World Bank Development Indicators. The Autoregressive Distributed Lag (ARDL) model bound test approach to co-integration was applied. It was found that real output had a positive relationship with migrant remittances in line with a prior expectation. Control variables such as exchange rate, inflation and financial development all exhibited the expected relationships with migrant remittances. One policy implication of our finding centres on promoting output. This entails tempering the profound impediments to basic production, country wide. These impediments include infrastructure inadequacy and insecurity. For improved remittance flow, adequate attention also needs to be paid to all determinants which demonstrated significant impact on diaspora remittances. These include exchange rate, inflation and financial development.

Keywords: Migrant, Remittances, Real Output Growth
JEL Classification Codes: F22, F24, O47

1. Introduction

Remittances have become a significant contributor to the economic progress of nations, especially developing countries

(United Nations Development Programme [UNDP], 2015). They contribute scarce, rather cheap foreign capital, which eases not just the capital scarcity in developing countries but also their efforts to improve the inflow of foreign exchange required to pay for imported goods. To the receiving families the flow of funds is an important source of income. The recipients often depend on them for their daily consumption, and investments, both of which constitute a boost to aggregate demand and output. In this way, migrant remittances represent a notable source of economic support to developing countries.

Remittances are different from other external capital inflows, which equally promote economic progress; inflows such as foreign direct investment, foreign loans and aid. They are more sought-after because the conditions for their flow are relatively less stringent, their costs are also lower, and they are stable (Kapur, 2004). As they become a notable source of foreign capital inflow to developing countries, these countries seek and encourage their inflow, going to great length to improve the digital aspects of capital flows and the macroeconomic conditions at home.

The macroeconomic conditions in the home and host countries undoubtedly influence the remitting decision of the migrant (Adenutsi, Aziakpono, & Ocran, 2011). From a basic investment motive and a portfolio choice, the home economy's real output growth is expected to improve with increasing inflow of remittance funds, and by so doing inspire the confidence of migrants. The increasing confidence in their home economy will in turn encourage further remittances from the migrants, especially those that are focused on investment and probably not so altruistic by inclination. Conversely, lack of demonstrable economic progress in the home economy after years of increasing remittances cannot generate the confidence in the migrants to regard their home economy as an attractive investment destination. This may encourage them to invest in their country of residence, while maintaining altruistic remittances to their home country only.

From the literature, many factors contribute to migrant remittances (Organisation for Economic Co-operation and Development [OECD], 2005). High interest rate in the migrant's home country, for example, as an aspect of the macroeconomic condition of the home economy, could be interpreted as a sign of favourable or high earnings on investible capital and therefore a spur for remittance

inflow. Foreign exchange rate misalignments, when unfavourable to the migrant, may affect the flow of remittance. The level of sophistication of financial markets and institutions also affect the flow of remittances. Establishing a payment system that expeditiously promotes settlement, uses state of the art technology, and leverages on the benefits of innovations in mobile phone and internet technology can influence higher remittances. However, a key condition for receiving substantial, investment-motivated remittance, once the financial well-being of the migrant and the host country have been provided for, appears to be the basic health of the home economy. The existing literature on remittances focus mainly on how remittances can influence various aspects of the home economy, especially aspects such as poverty eradication, growth, exchange rate fluctuations and income inequality. However, not much has been done on the manner in which real output and population growth influence the inflow of migrant remittances, and it is this aspect that this study focuses upon.

Numerically, remittances stood at $0.64 million in 1970 and rose to $22 million by 1980 and $1.9 billion in 1997. The trend took a steady and sharp increase to $21.9 billion in 2013 and $42 billion in 2016 which, according to World Bank (2024) was 4.86% of the country's GDP. Although it fell slightly to 3.98% of GDP in 2000 it bounced higher to 5.37% in 2023. Output growth, thought to be a major pull for inward remittances to Nigeria has followed its own dynamics, alternating between positive and negative growth. Clearing from the negative growth of 1993 to 1995, the economy grew robustly, reaching a peak in 2009/2010 and subsequently cooling off to a negative growth of nearly -2% in 2016. The economy has struggled since then from global and domestic pressures especially the COVID-19 scourge and the insecurity within. It was again a negative growth of nearly -2% in 2020 and a moderate growth of 2.87% in 2023. This work takes a closer look at how these dynamics relate.

2. Review of literature

2.1 Conceptual Review

2.1.1 Remittances

Remittance as a concept is linked with the idea of migration. Migration entails movement away from one's base or native soil into foreign land and is undertaken with a motive. Movement away from home and into foreign land in search of safety, peace or greener pasture gives rise to the possibility of remitting monetary value back

home, to those left behind to weather the storm or whose benevolence made migration possible or both. Remittance is therefore defined as any asset associated with migration, emanating from a migrant's place of sojourn and headed to the home country, and it may be informally transferred or delivered using formal channels (World Bank, 2005).

2.2 Theoretical Review

In this section, we carry out a brief review of extant theories aimed at explaining remittance motives and patterns of flow.

2.2.1 Theory of Altruism

Altruism, which is a natural starting point, views the migrant as a bona fide member of a closely knit family/society, which family formed his base and support and from which he has launched into a foreign land. Pure altruism therefore posits that the income of the family, the income of the migrant and their degree of cohesion are determinants of remittance flow. With increasing income of the migrant, remittance should improve subject to the perceived need at home which is determined by the family income. The degree of family cohesion, if maintained or improved, will lead to higher remittance as the migrant's income improves (Straubhaar & Vădean, 2006). A given migrant's remittance might be affected by the number of other migrants from the same family. Funkhouser (1992) opines a decrease in the amount of remittance per migrant when there are others from the same family. However, the prospect exists for an increase in the amount of remittance made per migrant when collective remittance comes into play or when motives beyond altruism become the vogue.

2.2.2 Theory of Self-Interest

Beyond altruism, Self-Interest is an extant motive for migrant's remittances. In altruism, it is assumed that the migrant derives satisfaction from the welfare of family members. In self-interest, however, the aim or motivation takes a variety of other different forms, ranging from the desire to protect existing assets, to the ambition to inherit (Brown, 1997), and the preparation for possible return home, as well as the garnering of goodwill, prestige and influence within the family and society as social and political capital (Glytsos, 2002, 2005). With the steadily depreciating value of the national currency, the continuously increasing rate of inflation, the widening insecurity and the generally unstable macro environment in Nigeria, the practical aspects of this theory appear self-evident.

2.2.3 Hybrid Theory of Migrant Remittances

Several explanations of the motives behind remittances have arisen as Hybrids of altruism and self-interest. These contain the essential elements of both theories plus specific aspects not fully covered by them. The explanations in question include implicit family agreement (Lucas & Stark, 1985), Co-insurance model (Poirine, 1997) and Migrant's savings target (Straubhaar &Vădean, 2006). This study takes cognizance of them but focuses more on the portfolio management decisions.

2.2.4 Theory of Portfolio Management Decision

Portfolio management decisions focus on investment motivated remittances. Here the financial conditions of the migrant, the host country and home economy as well as that of the home family, all play important roles. Profitability and capital accumulation are core to remittance flow, and a decisive ability is one that can optimize the exploitable opportunities using the remittance stream. Where the home family is in no position to anchor or manage investments optimally, remittance flow will be hindered. They will also be hampered by lack of progress and instability on the part of the home economy because these endanger entrepreneurship, good investment and ultimately private capital. Therefore macro metrics for home and host economies such as financial asset returns, exchange and interest rates, inflation, are constantly required for decision making (Munshi, 2003). The remittances may be personal savings not needed by the migrant (Ratha, 2003). They may very well be borrowings in a climate of cheap capital in the host country or a deliberate portfolio decision when opportunity is detected between host and home.

That there is no mutual exclusivity with these theories is clear when each model is thoroughly scrutinized. A migrant's remittance today may result from the dominance of one model or factor only for a different one to take precedence over others tomorrow. Their relationships might thus be dynamic and possibly nonlinear. The great diversity of migrants and periods in the global economic history suggest the possibility of non-universal peculiarities. However, an irreducible minimum or meeting point is the performance of the economy once non-altruistic remittance comes into consideration. In addition to stability, the fundamental consideration is growth of real output.

2.3 Empirical Review

Focusing on the strategies to improve diaspora remittances, Osayi and Dibal (2024) explored the role of macroeconomic fundamentals. Exchange rate, unemployment rate, inflation rate and gross domestic output stood in for the fundamentals. They found that diaspora remittances related positively with inflation, gross output and unemployment, while exchange rate showed an inverse relationship. Data for the period 1990 t0 2021 obtained from the World Bank data base was used for the study. They recommended policy formulation by Central Bank of Nigeria (CBN) that would encourage remittance inflows through the banking system as well as measures to keep inflation at single digit.

Using panel pooled mean group estimator, Keho (2024) employed data for the period 1975 to 2019 in a panel of 10 sub-Saharan African countries, and investigated the interaction effects between migrant remittances, domestic investment and financial development at different levels of financial development. The results revealed positive effects of remittances and financial development on domestic investment and further indicated a threshold effect of financial development in the investment remittance interaction. The author recommended the adoption of appropriate policies by West African countries to lower transaction costs and increase their financial sector. This would facilitate the channelling of gains from remittance to investment and growth.

Dwelling on the new economics of labour theory, Akanbi and Yusuf (2024) enquired into the influence of governance quality on diaspora remittances in Nigeria. They chose the period 1990 to 2022 and implemented the ARDL and ECM techniques. The variables they selected for governance quality – rule of law, government effectiveness and political stability – showed long run significant impact on remittances. They therefore recommended the enhancement of governance quality such as increased transparency and reduced transactions cost as these can improve trust and remittance inflow.

Al-Senani and Abida (2024) used the Generalised Method of Moments (GMM) to explore the relationship between financial development, economic growth and migrant remittances for Tunisia, Algeria and Morocco (Maghreb region). Covering the period 2000 to 2021, they found that remittance had a heightened effect in the face of financial development. Its effect on growth was found to be positive.

They recommended that reforms should be driven by local level improvement efforts in order to impact financial development, which in line with their findings will influence remittances positively.

Within the framework of Environmental Kuznets Curve, Yi and Qamruzzaman (2024) focused on the relationship between export earnings, infrastructural development, environmental sustainability, economic growth and migrant's remittance. Applying both ARDL and NARDL analytical techniques on data for Bangladesh for the period 1990 to 2020, they found that remittance exacerbate environmental degradation significantly. Their analysis however revealed an inverted U-shaped connection between remittance flows and environmental degradation, suggesting that sustainable environmental conditions might be driven by increased remittances. The authors recommended a careful assessment of the environmental impact of remittances and drive for improvements in Technical Innovation.

Cookey and Ochuba (2024) investigated the role of unemployment in the flow of migrants, which flow is the conceptual basis of workers' remittances. They found that unemployment was a spur for migration irrespective of gender. Unemployment in the home country, if conditions favour outward migration, will often lead to increased future remittance back home. They recommended the creation of more job opportunities through support for industries with high employment potential.

Salisu, Muhammad, and Saliu (2024) focused on the inflation migration relationship, concluding that migration's effect on inflation was a long-term phenomenon. They found that high interest rate cushioned the short-term inflationary effect of migration. Their study thus drew attention to the relevance of monetary policy in massaging the effects of remittances consequent upon migration. Accordingly, they recommended innovative measures beyond the use of interest rates.

Magwedere and Marozva (2023) used the panel auto distributed lag model to probe the nexus between migrant remittance and domestic-investment for 30 African countries. They also applied the Dumitrescu-Hurlin Causality test procedure. Data was sourced from World Development Indicators data base for the period 2000 to 2021. For control, the model included three variables, namely savings rate, economic growth and price stability proxied by inflation. Bi-directional causality between domestic investment and diaspora remittance was uncovered by the study as well as long run

relationships. Policies that support the business climate were recommended.

Fagiolo and Tommaso (2023) applied the gravity model in their study of country specific as well as dyadic effects in explaining workers' remittance flows. They found statistically significant size effects on remittance flows, in particular the population at home and the number of migrants in the host country. Ahmet and Neyapti (2006) employed high frequency data to investigate the findings of Aydas, Metin-Ozcan and Neyapti (2005) regarding the determinants and flow of workers' remittances to Turkey. Two distinct perspectives were specifically considered, namely the long and short terms. Evidence supported the findings by the earlier study regarding the investment smoothing motive. At the same time they concluded that consumption smoothing was a short term motive for workers' remittances. Their study reemphasized the role of the domestic and host economies for attracting remittances from present location to home.

The rapid increase in remittance inflows in Turkey and the chequered history of military rule induced close attention to flows of workers' remittances by researchers. The surprising rise of inflows to a significant proportion of imports within the last decades of the 20th century and beyond made such study quite imperative. Aydas, Metin-Ozcan and Neyapti (2005) took up the search for the determinants of workers' remittances and established two important motives namely consumption smoothing and investment smoothing. They found that after 1980s investment smoothing motive appeared prevalent. They established the adverse effects inflicted on remittances by inflation, military intervention and black-market premium. The performance of both home and host economies also affected the flows, leading them to recommend political and economic stability and a sound exchange rate regime in attracting remittance flows.

In the literature, great attention has been paid to the effects of migrant remittances on various aspects of the economy. Also, attention has been devoted to uncovering how groups of macro metrics relate with remittances, and how remittance flow can be improved. Our study isolates an important metric, real output growth of home country, specifically seeking how it affects diaspora remittance inflow.

3. Method

3.1 Model Specification

A single equation model was developed following Aydas *et al.* (2005). This was adapted to suit our purpose principally by including control variables considered necessary to elicit the influence of real output growth, while dropping others considered superfluous such as regime change, overvaluation and migrant stock.

Accordingly, the following migrant remittance model was specified:

$$REM = f(RGDP, POP, UNR, INT, EXHR, INF, FDV) \ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Where: REM is migrant remittances and the dependent variable while RGDP is real gross domestic product. As stated, control variables were considered. These arose from the literature and are previously established determinants of migrant remittances whose inclusion in the model would enable the study better isolate the effects of real output growth. They are: Population Growth (POP) – Fagiolo and Tommaso (2023); Unemployment Rate (UNR) – Cookey and Ochuba (2024); Interest Rate (INT) – Salisu et al (2024); Exchange Rate (EXHR) – Hor and Pheang (2017); Inflation Rate (INFL) - Tsaurai and Maseko (2020) and Financial development (FDV) – Tabit and Moussir (2016).

A functional, log-linear transformation of the model was carried out as follows:

$$LREM = \Pi 0 + \Pi 1 LRGDP + \Pi 2 LPOP + \Pi 3 LUNR + \Pi 4 LINT + \Pi 5 LEXHR + \Pi 6 LINF + \Pi 7 LFDV + U \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

Where L is natural logarithm, Π_0 to Π_7 represent the parameters and U the stochastic error term.

On *a priori* it is expected that: $\Pi_1 > 0$; $\Pi_2 > 0$; $\Pi_3 < 0$; $\Pi_4 > 0$; $\Pi_5 < 0$; $\Pi_6 < 0$; $\Pi_7 > 0$.

A dynamic model was further specified to characterise the dynamic effects of the determinants as follows:

$$LREMt = \Pi 0 + \sum_{i=0}^{n} \Pi 1\, LRGDPt - I + \sum_{i=0}^{n} \Pi 2\, LPOPt - I + \sum_{i=0}^{n} \Pi 3 LUNR_{t-I} + \sum_{i=0}^{n} \Pi 4 LINT_{t-i} + \sum_{i=0}^{n} \Pi 5 LEXHR_{t-i} + \sum_{i=0}^{n} \Pi 6 LINF_{t-i} + \sum_{i=0}^{n} \Pi 6 LFDV_{t-i} + \mu_t \ldots\ldots (3)$$

To investigate the time series properties of all variables, Stationarity tests were carried out using Augmented Dickey-Fuller (ADF), Philip-Perron (PP) and Zivot-Andrews (ZA) procedures. The Autoregressive Distributed Lag (ARDL) model bound test approach to co-integration proposed by Pesaran, Shine.and Smith (2001) was selected on account of the mixed order of integration of the time series data. Accordingly, ARDL methodology was applied to obtain the long

run estimates as well as the short run estimates using the error correction mechanism. The procedure consists of estimating an unrestricted error correction model with the following generic form:

$$\Delta LREMt = \theta 0 + \sum_{i=1}^{n} \theta_1 \Delta LREM_{t-1} + \sum_{i=1}^{n} \theta_2 \Delta LRGDP_{t-1} + \sum_{i=1}^{n} \theta_3 \Delta LPOP_{t-1} + \sum_{i=1}^{n} \theta_4 \Delta LUNR_{t-1} + \sum_{i=1}^{n} \theta_5 \Delta LINT_{t-1} + \sum_{i=1}^{n} \theta_6 \Delta LEXHR_{t-1} + \sum_{i=1}^{n} \theta_7 \Delta LINF_{t-1} + \sum_{i=1}^{n} \theta_8 \Delta LFDV_{t-1} + \Phi_1 LREM_{t-1} + \Phi_2 LRGDP_{t-1} + \Phi_3 LPOP_{t-1} + \Phi_4 LUNR_{t-1} + \Phi_5 LINT_{t-1} + \Phi_6 LEXHR_{t-1} + \Phi_7 LINF_{t-1} + \Phi 8 LFDI_{t-1} + \varepsilon t \quad \ldots\ldots(4)$$

Where all acronyms remain as previously indicated and Δ is difference operator while θ is the variable coefficient/parameter.

The accompanying short run dynamic coefficients are estimated through the following error correction model:

$$\Delta LREMt = \theta 0 + \sum_{i=1}^{n} \theta_1 \Delta LREM_{t-1} + \sum_{i=1}^{n} \theta_2 \Delta LRGDP_{t-1} + \sum_{i=1}^{n} \theta_3 \Delta LPOP_{t-1} + \sum_{i=1}^{n} \theta_4 \Delta LUNR_{t-1} + \sum_{i=1}^{n} \theta_5 \Delta LINT_{t-1} + \sum_{i=1}^{n} \theta_6 \Delta LEXHR_{t-1} + \sum_{i=1}^{n} \theta_7 \Delta LINF_{t-1} + \sum_{i=1}^{n} \theta_8 \Delta LFDV_{t-1} + \zeta ECM_{t-1} + Z_t \quad \ldots\ldots(5)$$

Residual and stability diagnostics were carried out including Serial correlation LM test, Hetroscedasticity test and Ramsey Reset and Recursive estimates. For robustness, Cholesky Impulse response function relating the probable reaction of migrant remittances to shocks in real output growth was investigated.

4. Results and Discussion

Table 1: Long Run Regression Results

Dependent Variable: LREM

Variable	Coefficient	Std Error	t-statistics	P-value
LRGDP	4.979***	0.902	5.519	0.0000
LPOP	3.779***	1.277	2.959	0.0042
LUNR	2.989**	1.169	2.555	0.0431
LINT	-0.284	0.287	-0.989	0.3289
LEXHR	-5.202***	0.883	-5.894	0.0000
LINF	-0.133	0.204	-0.649	0.5200
LFDV	1.509**	0.498	3.034	0.0295
Constant	-17.44***	6.512	-2.679	0.0109

Source: Authors' computation using E views 9.5 (2025)

Table 2: Short-Run Regression Results (Error Correction Mechanism)

Dependent Variable: Δ(REM)

Variable	Coefficient	Std Error	t-statistics	P-value
C	-0.74	1.83	-0.41	0.6876
ΔLREM(-1)	0.14	0.17	0.87	0.3906
ΔLRGDP(-1)	2.50**	1.12	2.23	0.0431
ΔLRGDP(-2)	0.38	0.50	0.75	0.4567
ΔLPOP(-1)	25.52	20.90	1.22	0.2314
ΔLPOP(-2)	-25.21	20.47	-1.23	0.2376
ΔLUNR(-1)	4.80**	1.88	2.55	0.0161
ΔLUNR(-2)	5.07**	2.09	2.43	0.0212
ΔLINT(-1)	0.24	0.20	1.24	0.2249
ΔLINT(-2)	-0.09	0.21	-0.44	0.6616
ΔLEXHR(-1)	-3.32**	1.05	-3.16	0.0057
ΔLINF(-1)	-0.17	0.17	-0.99	0.3281
ΔLFDV(-1)	0.71	0.75	0.95	0.35
ECT(-1)	-0.25**	0.11	-2.30	0.0441
NOTE: R-Square = 0.51 (51%) F-statistic = 2.59 (0.017196) Durbin-Watson stat. = 1.73				

Source: Authors' computation using E views 9.5 (2025)

Table 3: Breusch-Godfrey Serial Correlation LM Test

F-statistic	1.656089	Prob. F(2,36)	0.2051
Obs*R-squared	3.875649	Prob. Chi-Square(1)	0.1440

Source: Authors' computation using E views 9.5 (2025)

Table 4: Heteroskedasticity Test: ARCH

F-statistic	5.407965	Prob. F(1,43)	0.1002
Obs*R-squared	5.027239	Prob. Chi-Square(1)	0.0250

Source: Authors' computation using E views 9.5 (2025)

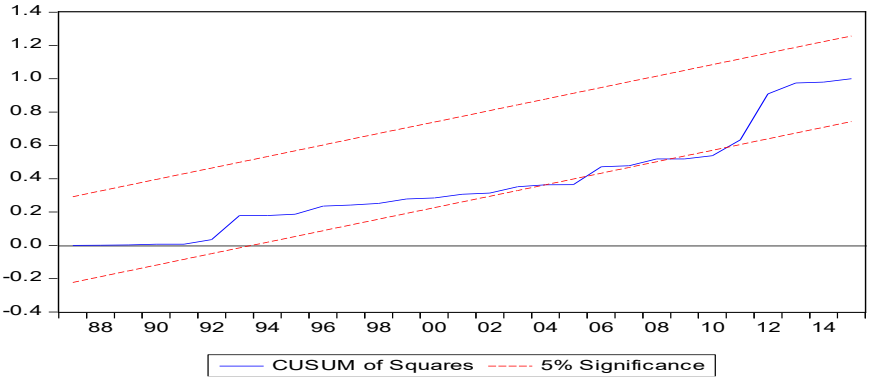

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Figure 1: Result of CUSUM Square Test
Source: Authors' computation using E views 9.5 (2025)

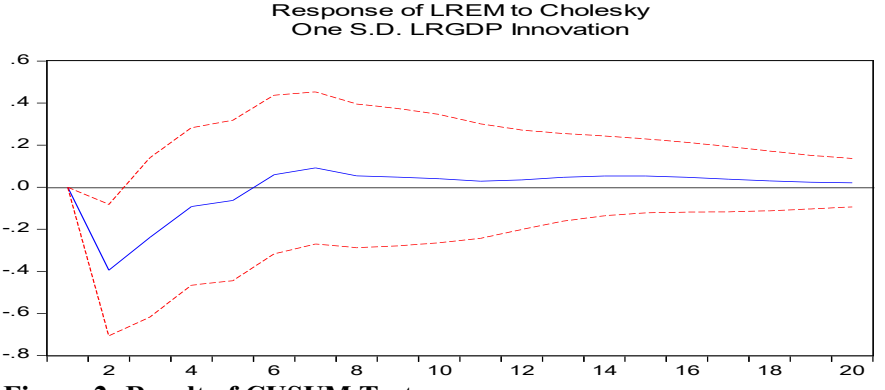

Figure 2: Result of CUSUM Test
Source: Authors' computation using E views 9.5 (2025)

4.1 Discussion of Findings

From the results, real output growth turned out to be positively related with migrant remittances. This was the expectation, a priori, and the finding of some other researchers such as Aydas *et al* (2005). The positive relationship was the case even in the short run. It proved to be highly significant statistically and economically, and stable, offering a promising policy handle since the results confirm that remittances do respond to shocks to real output growth. The response to shocks is negative all the way to the 5th period and positive for at least 15 periods thereafter, in a manner suggestive of rallying.

The policy implications of these outcomes centre on promoting output growth. In the Nigerian setting, promoting output growth translates to tempering the profound impediments to basic production, country-wide. Clearly there are shortcomings in production factors, the amelioration of which can directly result to output growth, in line with the findings of Yi and Qamruzzaman (2024). The achievement of output improvement, as our results show, will directly influence positive improvement of migrant remittances. In line with economic realities, and the findings of researchers, which continually emphasize the role of home economy in attracting diaspora remittances - (Ahmet and Neyapti (2006); De *et al* (2016) - we single out infrastructure, security and power.

5. Conclusion and Recommendations

The study isolated and re-examined the relationship between real output growth in home country economy and migrants' remittances. The positive relationship expected a priori was confirmed both statistically and economically. The emergent policy imperative centered on promoting real output growth, and the first step was identified as ameliorating the profound impediments on production in the Nigerian economy. Accordingly, the following recommendations were made:

i. That an infrastructure audit be carried out and where applicable, deficit-sheet developed for the economy. The reduction of such deficit should be made the primary goal of all tiers of government, with a score sheet as an index of governance.

ii. Close attention to other significant determinants of diaspora remittances established by the study. These include foreign exchange rate, inflation and financial development.

iii. Attention to internal security subsector especially the north east and south east of Nigeria. This is in line with economic realities as there is an unambiguous fall in output in those areas resulting from security breach.

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