

Modeling the Relationship Between Remittance Inflows and the Growth of Nigeria's Domestic Economy: VEC Granger Causality Test Approach

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ARTICLE INFO

Received: 5 September 2020

Revised: 5 October 2020

Accepted: 10 Dec. 2020

Published: 20 Dec. 2020

Keywords:

Remittance inflows, Vector Error correction model, Granger Causality, Wald test, Correlation,

Abstract: The focus of this paper is to determine the extent international remittance inflows predict the growth of Nigeria's domestic economy ranging from 1980 to 2019. To achieve such objective, the author adopted VEC Granger causality test for estimation of the parameters specified in the models. This is complimented with other standard econometric pre-tests and post-tests such as unit root tests, co integration tests as well as vector error correction model to determine the properties of the time series data used for the analysis. The result of the analysis indicates that the series employed for the analysis exhibits long run co integration. The Vector Error Correction Model (VECM) results also show a negative significant relationship between international remittance inflows and real gross domestic product in the short run as indicated by a t-statistics coefficient of -6.874905 and a p-value of 0.0087. Consequently, from the long run result of the VECM, international remittance inflow maintained a negative relationship with economic growth in the long run. The Wald test indicates no causality among RGDP, IRIGWT, ODAGNI, BOT and INF. VECM in the second equation of the study shows a positive insignificant relationship between international remittance inflows and domestic credit to private sector in the short run within the period under consideration with a t- statistics of 0.053623 and p-value of 0.6807. However, from the long run result of the VECM in the second equation, international remittance inflows indicate a negative relationship with domestic credit to the private sector in the long run. The result of the error correction model in the short run as indicated by the lower chamber of VECM showed a positive significant correlation between overseas development assistance and gross domestic product as indicated by the t-statistics of 8.643742 and p-value of 0.0097. The result from the upper chamber of the VECM indicates a negative relationship between overseas development assistance and economic growth in the long run. The implication of the study is that international remittance

inflows have not translated considerably to the growth of Nigerian economy. In view of the above findings, the study makes the following recommendations: the federal government should adopt strict policy measures to regulate international remittance inflows to Nigeria by ensuring proper investment of greater percentage of all remittances. This can be done by insisting that all remittance above certain level be accompanied with an investment plan or properly taxed. In order to encourage remittances passing through the official channel, the Central Bank of Nigeria should ensure that transaction cost of international remittance inflows are kept very minimal.

1. INTRODUCTION

The increasing trend in international remittance inflows is filling the gap of foreign exchange shortages in Nigeria and other developing countries. However, some researchers argued that increase in the international remittance inflows contribute to brain drain in the developing countries. Singabele [23] quoting Emeagwali [8] stated that brain drain was one of the greatest hindrances to the socio-economic development of African continent. According to Singabele, referring to the work of Dovlo (2008), argued that Africans, Nigerians inclusive, will remain at the mercy of poverty, disease, hunger and social unrest, if those who should build the pillar of the continent's development are abandoning their moral obligations for the so-called greener pastures.

Former South African President, Thabo Mbeki [14] in his "African Renaissance" speech made emotional appeal, calling African professionals in developed countries to think about their continent. In his view, he looks forward to the return of Africa's skilled professionals from Europe and North America home to the continent. Mbeki argued that brain drain syndrome was being institutionalized in the continent. He opined that institutionalization of brain drain was devastating African economy and crippling the very fabric of African development as the continent's potentials were left lying raw and under-utilized due to absence of experts (Singabele,[23]).

Brain drain has been a major argument against international remittance inflows to Nigeria. Other issues include the contribution of remittance inflows to the growth rate of GDP in Nigeria when compared to other international inflows, such as overseas development assistance (ODA). The trend of the growth rate of gross domestic product (GDP) and international remittance inflows in Nigeria, according to UNDP, World Development indicators [30] is stated as follows: In 1980, 1985, 1990, 1995, 2000, 2005, 2010, and 2015, gross domestic product growth rate were 4.2%, 8.3%, 12.77%,

2.5%, 5.4%, 6.94%, -0.23%, and 8% respectively while international remittance inflows growth rates within the periods were 0.03%, 0.03%, 0.03%, 2.82%, 3.0%, 13.4%, 5.35%, and 3.81% respectively.

The trend above is in contrast to general view of most economists who believe that there is a positive relationship between international remittance inflows and the growth of gross domestic product. The proponents of the positive relationship between the international remittance inflows and economic growth, such as Docquier, Rapoport, & Shen, [7], in their optimistic theory of international remittance inflow, contended that remittance inflows decrease inequality in the recipient countries, enable household to relieve budget constraints, and stimulate demand of goods and services, which, in turn, stimulate increase in gross domestic product. The pessimistic theory, according to Stark, Taylor and Yitzhaki [25], argued against the positive effect of remittance flows. The pessimistic theory opined that remittance inflows may generate a level of domestic demand that exceeds the economy's production capacity, and thus may represent a source of inflation, or unemployment, if cheaper imports are brought in to expunge the remittance-induced excess demand. From the trend of UNDP, World Development Indicator [30] as stated above, it is clear that the relationship between growth rate of gross domestic product (GDP) and international remittance inflows did not follow a consistent trend pattern in Nigeria. There are no visible policy actions by Nigerian government regarding efficient application of international remittance inflows. Most previous studies concentrated on the analysis of the remittances as a contributor to brain drain in Nigeria. Also, these previous studies did not compare international remittance inflows together with other key and important variables like balance of trade, oversea development assistance, exchange rate; domestic credit to private sector, etc, thereby creating a need for further studies on their impacts and short-term and long-term relationships. Some researchers argue that oversea development assistance contribute meaningfully to economic growth through infrastructural and capital development more than international remittance inflows which end mostly on consumption. This study, in formulating research questions, objectives of the study, and hypotheses intends to look at the growth rate of international remittance inflows and growth of domestic economy in Nigeria with the hope of making policy recommendations.

1.2 Research Questions

The following research questions will guide the study

- (i) Is there any significant casual relationship between international remittance inflows and economic growth in Nigeria?

- (ii) To what extent do international remittance inflows impact on the growth of Nigerian economy?
- (iii) How does overseas development assistance influence the growth of the Nigerian economy more than international remittance inflows?
- (iv) To what extent does international remittance inflows contribute to the growth of domestic credit to private sector in Nigeria?

1.3 Objectives

The broad objective of this study is to determine empirically the impact of international remittance inflows and the growth of Nigeria domestic economy. Specifically, the research intends to investigate if:

- (i) there is any significant casual relationship between international remittance inflows and economic growth in Nigeria.
- (ii) international remittance inflows impact on the growth of the Nigerian economy.
- (iii) overseas development assistance (ODA) influences the growth of Nigerian economy more than international remittance inflows
- (iv) international remittance inflows contribute to the growth of credit to private sector in Nigeria.

1.4 Hypotheses

This study will test the following null hypotheses:

- (i) there is no significant casual relationship between international remittance inflows and the growth of Nigeria economy
- (ii) international remittance inflows do not impact on the growth of Nigeria economy within the period under review
- (iii) Overseas development assistance (ODA) does not influence the growth of Nigeria economy more than international remittance inflows.
- (iv) International remittance inflows, do not contribute to the growth of domestic credit to private sector in Nigeria.

1.5 Significance of the Study

Theoretically, this study will complement the existing literature by exploring the growth effects of remittance inflows in a broader perspective of remittance theory. It will offer a unified treatise on remittance flows and growth of domestic economy in Nigeria. The study will highlight the

migration issues in Nigeria, the destination or the final uses of the remittance inflows and how the inflows can contribute to the country's economic growth.

Practically however, this study will encourage Nigerian government to emulate countries, such as Israel, Indians, Chiles, and other countries that have developed national policy framework on how to interact with their diaspora. It is hoped that with the outcome of the study and the recommendations, the National Assembly and State House of Assemblies will be enlightened more on the importance of Diaspora Commission which will help the Federal Government and State Government to harness the benefits of international remittance inflows to Nigeria. The study will recommend the application of economic diplomacy and the encouragement of Nigerians in diaspora to do what the diasporas of other countries are doing to improve bilateral trade between their countries and other countries. The study will also show them how to attract foreign investors to Nigeria and transfer necessary skills and knowledge. Most importantly, how Nigerians in diaspora can be more patriotic like their counter-part in other countries by not waiting for government but to develop their own initiatives.

2. THEORETICAL LITERATURE REVIEW

2.1 Optimistic and Pessimistic Theory

Proponents of the positive effect contended that international remittance inflows decrease inequality in the recipient countries (Docquier, Rapoport, & Shen, [7]). Also the optimistic argued that international remittance inflows enable household to relieve budget constraints, and stimulate demand of goods and services, which, in turn, stimulate production and employment (Stark, Taylor & Yitzenaki, [25], [25]; Taylor & Wyatt, [27]. Moreover, Quibria [18, and Ratha [20] argued that international remittance flows provide the much needed currency for importing essential inputs that are unavailable in domestic economy.

Pessimism about the positive effect of remittance flows has two main arguments. Firstly, remittance flows may generate a level of domestic demand of goods that exceeds the domestic economy's production capacity, and thus may represent a source of higher inflation Adams [1], or increasing unemployment, if cheaper goods are imported to expunge the remittance-induced excess demand of goods. Secondly, given the income effect of international remittance flows, recipients of international remittances could afford to work less. Resulting in the decrease in labor supply, which in turn may somewhat lead to a negative effect on domestic economic growth. As determinants of gross domestic product (GDP), international remittance

inflows have been extensively studied by economists. However, the most existing works, both empirical and theoretical, either treated them separately Rapoport & Katz, [19]; or when treated jointly e.g., McCormick & Wahba, [15], their economic growth implications are not discussed.

2.2 Endogenous Migration and the “Portfolio” Theory

Elbadawi and Rocha [9] presented a detailed theoretical review and insightful analysis of the literature on the causes of immigrant remittances, which applies well to all remittances. They divide this literature into two main strands: the “endogenous migration” approach, and the “portfolio” approach. The endogenous migration approach is based on the economics of the family, which include but not limited to motivations based on altruism. The portfolio approach isolates the decision to remit from the decision to migrate, and likewise avoids issues of family ties. In this view, the migrant earns income and decides how to allocate savings between host country assets and home country assets.

Remittances are a result of deciding to invest in home country assets. The portfolio view, therefore, is an informal theory of international remittance inflows that supports the view that international remittances behave like other capital flows. The rates of return on various assets, or return differentials are regarded as important decision variables affecting remittances in the portfolio view. The variables often included in such studies are interest rate differentials on comparable deposit accounts offered in the host and home (labour-sending) countries, incentive interest rates offered on home country deposits, black market exchange premium (if any), the return on real estate in the home country, inflation rates, and other returns. In addition, political risk and uncertainty may also affect the decision to remit.

The endogenous migration approach and the portfolio approach are the most prominent approaches employed to perform empirical estimations of international remittance inflows determination. Wahba (31) introduced a dichotomy by dividing international remittances into “fixed” remittances, which go toward family support, and “discretionary” remittances, which are investment flows. In the view of this theory, the fixed remittances depend essentially on demographic and economic factors including family characteristics such as size and income level, and therefore may be explained by the endogenous migration view. In general, empirical analyses include some demographic variables such as the stock of migrants in the host country (or family characteristics in studies that use micro data), economic variables such as wages or income, and financial variables such as interest rates.

The demographic and income variables tend to be significant in nearly all the estimations, while the financial variables’ significance varies

depending on the sample and specification. Chami [5] pointed out that this is probably the most reliable stylized fact to come out of the empirical literature on the causes of remittances. While most papers have found evidence consistent with altruistic behavior, only a few papers such as Lucas and Stark [12] and Agarwal and Horowitz [2] have tested altruism against alternate family arrangements. Lucas and Stark [12] found evidence in favor of self-interested behavior in Botswana, while Agarwal and Horowitz found evidence in favor of altruism in Guyana.

2.3 The Marxian theory on the Growth of a Capitalist World Economy

This theory looks at the social consequences of the competition among industrialized capitalist which usually drives down the per-unit prices of commodities, thereby cheapening the commodities of producing state and creating ever-widening development gap between the industrialized and un-industrialized nations. In the view of Marxian theory, competition among industrialized capitalist create a situation where the displaced local producers look for other kinds of gainful work to survive. According to this theory, as outlined by Wolff and Resnick [32], the last two centuries might well be called the era of capitalist growth toward world dominance.

2.4 Neo-Marxist Theory

Neo-Marxists view migration with negative perspective. According to this school of thought, especially, as depicts by Azam and Gubert, [4], migration and international remittance inflows reproduced and reinforced the capitalist system by encouraging inequality between developed and least developed countries. Neo-Marxist, as regards the socio-cultural perspectives, argued that migration and remittance were seen as having negative effect as they expose migrant family to the taste of foreign goods.

2.5 Structural or Dependence Theory

The structural or dependency theory was theory studied by Todaro [28] and Chami [5] which assumed that dependency on global political-economic system have been dominated by the industrialized nations. The theory argued that as capitals from the industrialized nations grow, migration was assumed to have negative effect on traditional societies by undermining their economic potential and motivating migration from the less developed to developed countries. According to this theory, brain drain is one of the negative outcomes of capitalism on less developed societies. Structural or dependency theory concurs with Marxist and Neo-Marxist theories on the negative impact of migration from least developed to developed countries.

2.6 Altruistic and Self Interest Motive Theory

The motivated factor to migrant and remit has become a heated debate recently. Altruistic and self interest motive theory, according to Clarke and Drinkwater [6] and Rapoport and Katz, [19] was another hypothesis put forward as explanation of the determinant to migrate. In this view, altruism towards family members at home and the care for their consumptions and welfares were regarded as important determining factor for decision to migrate by intending migrants. On the other hand, self-interest was determinant for decision to migrate and remit to family in origin countries or to invest for future profit- making and preparing to return home in the near future. In general, this school of thought viewed remittance as result of inter-generation contract between migrants and their parents in the home country, concurred by Lucas and Stark [12].

2.7 Neo-Classical Economic Growth Theory

Neo-Classical theory as analyzed by Roel [21] opined that real salary differences between economies gave rise to bidirectional flows that culminated into a new international equilibrium in which real wage earning of all countries are the same. According to Roel, the flow starts from flowing of low skilled labor from low-wage earning countries to high-wage earning ones. His second assumption was capital flows from high-wage earning countries to low-wage earning ones. In his view, capital flow comprises labor intensive industrial capital moving together with high-skilled labor migration. Roel's second assumption agrees with Markovitz portfolio frontier theory and can be explained through utility function of Capital Asset Pricing (CAPM) which depicts that the cost of equity capital is determined only by the systematic or market risk. More so, Roel referred to Keynesian theory which views migration differently. He asserted that Keynesian regards labor supply to depend on the nominal wages, not real wage which implies that nominal wages is critical factor in labor migration. In essence, the major issue here is migration and income. Income is important variable to look at economic growth. The neoclassical production function of the Cobb-Douglas form in which output (GDP) is specified as a function of labor (L), capital (K), workers' remittances, and a technological factor or efficiency parameter (A) is very important function of economic growth.

2.8 The Late Neoclassical Theory of Human Behavior

The late Neo-classical theory of human behavior is a contrast to traditional neoclassical theoretical concept of defining human behavior in terms of a choice making person like a computer. Wolff and Resnick [32] distinguished between traditional and late neoclassical theory. In their analysis, traditional

neoclassic theory conceives a consumer as perfectly logical and wonderfully consistent in decision making or preferences, devoid of emotion, conflicting desires or contradictory preferences, and strangely immune from societal influences. Late neoclassical theories, on the other hand, depict a brief return to the concept of Marxian economics with its concept of “over determination.” The concept of over determination states that any individual’s economic behavior (or indeed any behavior) is understood as the product of different and multiple determinations emanating from all the natural, cultural, political, and economic processes comprising the total context in which that individual exist. The theory includes believes that the individual desires and behavior are the combined effect of the whole host of natural processes of mind and body inherited from long line of mostly unknown ancestors and of emotional processes stemming from both conscious and unconscious feelings of love, hate, hope, fear, jealousy, anger, empathy, and so on. In addition, the Late neoclassic asserted that individual desires and behavior are influenced by political processes, such as legislation, administration, and adjudication of rules and customs created within family, clan, tribe, community, and state.

Traditional and late neoclassical economists regarded the concept of homo economicus to represent human nature. Traditionalist views human nature of being selfish while the late neoclassical view the behavior of Homo economicus of being in conformity not only to some innate human nature but also to moral laws and rules of behavior imposed by the social structure into which Homo economicus is born and matures. The opposite of Homo economicus is Homo reciprocans introduced by some experimental economists as a completely new personality type with human nature which seeks to cooperate with those willing to cooperate and to punish those do not cooperate. Wolff and Resnick [32] argued that a number of economists have delved into the fields of evolutionary biology, cognitive psychology, sociology, and related disciplines focusing on the complexity of human behavior. The late neoclassical theory of human behavior concurs with Elbadawi and Rocha [9] which distinguish the difference between endogenous migration and the Portfolio approach of analyzing emigrant behaviors and their motives. Elbadawi and Rocha [9] model is a classical approach to the study of motivation for remittance inflows and its economic implication.

3. METHODOLOGY

3.1 Model Specification

In order to exhaustively test the specified hypotheses of the study, the researcher adopted two different models. Model one (1) explains the Output

– Remittance model of neoclassical endogenous growth theory which assumes that the relationships between output and remittance are motivated primarily by altruism and hence will most often exhibit countercyclical characteristics (Chami *et al* [5]. The assumption of altruistically motivated remittances is adequately captured within a system of equations characterized by three endogenous variables namely: growth rate of output (*YGR*), workers' remittances (*WR*), and per capita income (*PCI*). The neoclassical production function of the Cobb-Douglas form in which output (*GDP*) is specified as a function of labor (*L*), capital (*K*), workers' remittances, and a technological factor or efficiency parameter (*A*) is written explicitly as follows:

$$GDP = f(A, L, K, WR, PCI) \quad (1)$$

where *A* is the technological factor of the efficiency factor within the system, can be re-written as:

$$GDP = AL^\alpha K^{(1-\alpha)}WR, PCI \quad (0 < \alpha < 1) \quad (2)$$

where α is the relative share of labor in total output and $(1-\alpha)$ is the relative share of capital in total output.

The above model is modified to accommodate the relevant variables as

$$RGDP = f(IRIGWT, ODAGNI, EXR, INFL, BOT) \quad (3)$$

where, *RGDP*= RealGross Domestic Product (The Proxy variable for Growth of Domestic Economy), *IRIGWT*= Growth rate of International Remittance Inflows, *ODA*= Oversea Development Assistance(Gross National Index), *EXR*= Exchange Rate, *INFL* = Interest Rate, *BOT* = Balance of trade.

The second model was adopted to specifically address the fourth hypothesis of the study, using the finance – remittance framework explained through the capital asset pricing model(CAPM) which concurs with Markowitz [13] that studies the relationship between risks and returns, The CAPM is specified below;

$$\Sigma(R_i)_t = R_f + \beta_i (E(R_M))_{t-1} - R_f + \epsilon_t \quad (4)$$

Where $\Sigma(R_i)$ is asset's expected return, R_f is the expected excess return of the market portfolio's expected return over the risk-free rate, $\hat{\alpha}$ is beta which is the measure of asset sensitivity to movement in the overall market and $(E(R_M)) - R_f$ is the market premium, the expected excess return of the market portfolio's expected return over the risk-free rate.

The model is modified and stated functionally below in order to contain the relevant variables in the study;

$$DCPS = f(IRIGWT, EXR, INFL) \quad (5)$$

where, DCPS = Domestic Credit to Private Sector, IRIGWT = growth rate of international remittance inflow, EXR = Exchange Rate and INFL = Inflation

Equations 2 and 4 above are presented in a linear form for estimation as follows;

$$RGDP_t = \beta_0 + \beta_1 IRIGWT_{t-1} + \beta_2 ODAGNI_{t-1} + \beta_3 EXR_{t-1} + \beta_4 INFL_{t-1} + \beta_5 DCPS_{t-1} + \mu_t \quad (6)$$

$$DCPS_t = \alpha_0 + \alpha_1 IRIGWT_{t-1} + \alpha_2 EXR_{t-1} + \alpha_3 INFL_{t-1} + \epsilon_t \quad (7)$$

where, RGDP, IRIGWT, ODAGNI, EXR, INFL and DCPS are as explained above; β_0 and α_0 = Constant term, α_1, \dots, β_4 = Regression coefficients of both dependent and independent variables specified; μ_t and ϵ_t = Error Term.

3.2 Estimation Procedure

- (i) The study estimated the variables used in order to obtain the description/ summary statistics. The essence of this is to observe the characteristics of the data employed
- (ii) The study tested for integration level of the data employed using unit root tests approach, to verify if the data are suitable for the purpose intended. It was discovered from the results of the unit root tests that the variables were all integrated of order one (1), meaning that all the variables were stationary at first difference.
- (iii) With the fact that the variables were not stationary at levels, the research suspects that there may be some co integrating vectors or equations. The researcher was advised to run co integration test to confirm the existence or otherwise of the stable long run relationship (co integration) between the dependent and the independents variables. The results confirmed the existence of co integrating vector among the variables.
- (iv) With the existence of co integration established as indicated above, we are advised to employ the vector error correction mechanism (VECM) in the estimation of the research model to obtain the final results.
- (v) The system equation of the VEC model was estimated to gauge for long run causality and establish the values of the coefficients of the independent variable to enable us interpret the results.
- (vi) Finally, granger causality tests were conducted in the VEC environment to estimate the direction of the influence between the dependent and independent variables.

4. RESULTS

4.1 Unit Root Test Result

The Augmented Dickey-Fuller (ADF) statistic was employed to test for the existence of unit roots in the data using trend and intercept. Test result presented below is model 1 and 2:

Unit Root Test

Table 2: Augmented Dickey – Fuller Unit Root Test Result

<i>Variables</i>	<i>Level</i>	<i>5%CV</i>	<i>Pval.</i>	<i>1st diff</i>	<i>5% CV</i>	<i>Pval.</i>	<i>Decision</i>
RGDP	-1.184539	-3.544284	0.8983	-10.64834	-3.548490	0.0000	1(I)
IRIGWT	-2.476189	-3.544284	0.3371	-6.250958	-3.548490	0.0001	1(I)
ODAGNI	-3.254943	-3.544284	0.7888	-5.430184	-3.548490	0.0005	1(I)
DCPS	-2.118668	-3.544284	0.5180	-4.633705	-3.548490	0.0039	1(I)
EXR	-2.159829	-3.544284	0.4961	-5.543668	-3.548490	0.0004	1(I)
INFL	-3.050712	-3.544284	0.1337	-5.428573	-3.548490	0.0005	1(I)
BOT	-3.04228	-3.552973	0.2488	-12.42141	-3.557759	0.0000	1(I)

Sources: Author's computation, 2020 using E view 9.0

The unit root test above showed that all variables are stationary at first difference in both model one and two. This was indicated by the t-statistics and p values that are less than 0.05 (5%) level of significance as shown in table 1. This implies that the data is suitable for use in the model estimation.

Co-Integration Test Results Table 3: Co integration Test (First model)

In the first model, the co integration test is stated thus;
Unrestricted Cointegration Rank Test (Trace)

<i>Hypothesized</i>		<i>Trace</i>	<i>0.05</i>	
<i>No. of CE(s)</i>	<i>Eigenvalue</i>	<i>Statistic</i>	<i>Critical Value</i>	<i>Prob.**</i>
RGDP *	0.770049	109.9820	69.81889	0.0000
IRIGWT *	0.650749	64.41551	47.85613	0.0007
ODAGNI *	0.392892	31.80463	29.79707	0.0290
BOT *	0.348950	16.33413	15.49471	0.0373
INF	0.093114	3.029881	3.841466	0.0817

Trace test indicates 4 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

Sources: Author's computation, 2020 using E view 9.0

Table 4: Co integration Test (Second model)

Unrestricted Cointegration Rank Test (Trace)

<i>Hypothesized</i>		<i>Trace</i>	<i>0.05</i>	
<i>No. of CE(s)</i>	<i>Eigenvalue</i>	<i>Statistic</i>	<i>Critical Value</i>	<i>Prob.**</i>
DCPS *	0.912973	183.7749	95.75366	0.0000
IRIGWT *	0.672657	103.2044	69.81889	0.0000
RGDP *	0.647726	66.35178	47.85613	0.0004
ODAGNI *	0.437824	31.92136	29.79707	0.0280
EXR	0.319334	12.91532	15.49471	0.1180
INF	0.006668	0.220781	3.841466	0.6384

Trace test indicates 4 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

Sources: Author's computation, 2020 using E view 9.0

The co integration tests in the first and second model indicated four co integrating vectors respectively; this is indicated by the asterisk variables both in table 2 and 3. The implication of this result is that it can be relied upon for long run decision.

4.2 Granger Causality Test Results

The result of the causality test among the variables was reported using the Block exogeneity Wald test output as stated below. The result shows that causality does not exist between international remittance inflow and economic growth in Nigeria contrary to the outcome of the error correction term which is negative, fractional and significant. A negative error correction term implies a long run relationship among the dependent and independent variables as it is indicative of the speed of adjustment from the short run to long run equilibrium in the event of distortions in the economy.

Table 5: VEC Granger Causality Test

VEC Granger Causality/Block Exogeneity Wald Tests

Date: 05/08/17 Time: 15:33

Sample: 1980 2015

Included observations: 32

Dependent variable: D(RGDP)

<i>Excluded</i>	<i>Chi-sq</i>	<i>Df</i>	<i>Prob.</i>
D(IRIGWT_)	1.380991	1	0.2399
D(ODAGNI)	0.006309	1	0.9367
D(BOT)	1.175844	1	0.2782
D(INF)	1.044307	1	0.3068
All	5.657969	4	0.2262

Dependent variable: D(IRIGWT_)

<i>Excluded</i>	<i>Chi-sq</i>	<i>Df</i>	<i>Prob.</i>
D(RGDP)	0.994322	1	0.3187
D(ODAGNI)	1.076824	1	0.2994
D(BOT)	4.129850	1	0.0421
D(INF)	0.194218	1	0.6594
All	4.340801	4	0.3618

Dependent variable: D(ODAGNI)

<i>Excluded</i>	<i>Chi-sq</i>	<i>Df</i>	<i>Prob.</i>
D(RGDP)	0.354109	1	0.5518
D(IRIGWT_)	2.731441	1	0.0984
D(BOT)	0.419335	1	0.5173
D(INF)	0.524232	1	0.4690
All	3.283745	4	0.5115

Table 5: Continued

Dependent variable: D(BOT)

<i>Excluded</i>	<i>Chi-sq</i>	<i>Df</i>	<i>Prob.</i>
D(RGDP)	0.733787	1	0.3917
D(IRIGWT_)	2.335348	1	0.1265
D(ODAGNI)	0.009514	1	0.9223
D(INF)	0.004564	1	0.9461
All	5.648711	4	0.2270

Dependent variable: D(INF)

<i>Excluded</i>	<i>Chi-sq</i>	<i>Df</i>	<i>Prob.</i>
D(RGDP)	0.162189	1	0.6871
D(IRIGWT_)	0.384219	1	0.5354
D(ODAGNI)	1.699188	1	0.1924
D(BOT)	0.814575	1	0.3668
All	2.967906	4	0.5632

Sources: Author's computation, 2020 using E view 9.0

4.3 Test of Research Hypotheses

In testing the first hypothesis, p-value of the t-statistics in VECM are employed, while the p-value of the f-statistics in Wald test is used for the second hypothesis. For the third and fourth hypothesis, the p-values of the t-statistics in VECM are employed.

(i) Hypothesis One: There is no significant causal relationship between International remittance inflows and economic growth in Nigeria.

Decision Rule: Hypothesis of no causality is rejected if the p value is less than 0.05.

From the Wald test result, the p values of 0.3187 for RGDP and 0.2399 are greater than 0.05; therefore, the study accepts the null hypothesis and concludes that causality does not run between international remittance inflows and real gross domestic product in Nigeria.

(ii) Hypothesis Two: International remittance inflows do not impact on the growth of domestic economy in Nigeria.

Decision rule: if the p-value of the t-statistics in VECM is less than 5% critical value the null hypothesis is rejected.

Hypothesis one is tested using vector error correction mechanism (VECM). The null hypothesis is rejected if the p value is less than 0.05. From the VECM result presented in table 4, the p value of International remittance inflows (IRIGWT) is 0.0087 which is less than 0.05. The study therefore, rejects the null hypothesis and concludes that International remittance inflows have significant impact on Nigerian economic growth within the period of the study.

(iii) Hypothesis Three: Overseas development assistance (ODA) does not influence the growth of gross domestic product in Nigeria.

Decision rule: if the probability value of the t-statistics in VECM for ODA is less than 5% benchmark the null hypothesis is rejected.

From the VECM result presented in table 4, the p-value of overseas development assistance is 0.0097 which is less than 0.05. The study therefore rejects the null hypothesis and concludes that overseas development assistant influences the growth of gross domestic product.

(iv) Hypothesis Four: International remittance inflows to an extent do not contribute significantly to the growth of credit to the private sector in Nigeria.

Decision rule: if the probability value of the t-statistics in VECM for IRIGWT is less than 5% benchmark the null hypothesis is rejected.

From the VECM result presented in table 5, the p value of International remittance inflows (IRIGWT) is 0.6807 which is greater than 0.05. The study therefore accept the null hypothesis and concludes that International remittance inflows to an extent do not contribute significantly to the growth of credit to private sector within the period of the study

5. DISCUSSIONS

Result

The findings of the result are discussed in order to bring out the basic information from the analysis of each variable in the model estimated and also to link the discussion of the findings with the existing theory on the particular research work.

5.1 Co-integration Test

The result of the Johansen co integration test for real gross domestic product and international remittance inflow, overseas development assistance, balance of trade and inflation indicated four (4) co integrating vectors as shown in table 2 depicting the existence of stable long run relationship between the dependent and independent variables. This implies that the result of the estimation can be relied upon in taking long run decisions in the economy within the study period.

Also, the result of the Johansen co integration test for domestic credit to private sector, international remittance inflows, real gross domestic product, overseas development assistance rate and inflation also revealed four(4) co integrating equations as shown in table 3. This implies that the dependent variable (domestic credit to private sector) has stable long run relationship with IRIGWT, RGDP, ODAGNI, EXR, and INF, indicating also they can be relied upon in taking long run policy decisions. This result agrees with the findings in Singh and Mehra [24], Jawaid and Raza [10], Salahuddin [22], Nkoro and Uko [16], Omobitan [17] and Uda [29] whose studies indicated long run relationship between international remittance inflows and economic growth.

5.2 Vector Error Correction Model (1)

ECM which stands for error correction model met required conditions. Result of the ECM was significant indicating that inverse and statistical significant of ECM coefficients are essential conditions in order that any disequilibrium to be corrected. In light of this, the coefficient of ECM (-1) = -0.014621. Inverse result of ECM satisfied one condition and the P-value [0.0411] < 5% [0.05] critical value satisfied another condition of been

statistical significance. Result of ECM with the coefficient of (-0.014621) indicated that the speed of adjustment amid the short run dynamics and the long run equilibrium is 1%. Thus, ECM will adequately act to correct any deviations of the short run dynamics to its long-run equilibrium by 1% annually.

Computed coefficient of multiple determination (R^2) value of 0.715719 showed that 71% of total change in economic growth is accounted for, by the explanatory variables: international remittance inflows (IRIGWT), overseas development assistance (ODAGNI) balance of trade (BOT) and inflation (INF) while 29% of the changes in economic growth (proxied by RGDP) can be attributed to other factors not included in the regression equation influence. F – Statistics = 4.577527, with p value of 0.001596 which is less than 0.05 shows that explanatory variables jointly influence dependent variable significantly. Result of DW which stands for Durbin Watson is used to determine if there is autocorrelation among residuals, since the DW has the value of 1.67; it indicates the absence of auto correlation among the residuals.

5.3 Vector Error Correction Model (2)

The second model of the study was introduced to enable the researcher evaluate the third hypothesis aimed at understanding the influence of international remittance inflows on the growth of credit to private sector in Nigeria. The error correction term met the required conditions. Inverse result of ECM satisfied one condition and the P-value [0.0000] < 5% [0.05] critical value satisfied another condition of been statistical significance. Result of ECM with the coefficient of (-0.930569) indicated that the speed of adjustment amid the short run dynamics and the long run equilibrium is 93%. Thus, ECM will adequately act to correct any deviations of the short run dynamics to its long-run equilibrium by 93% annually.

Computed coefficient of multiple determination (R^2) value of 0.854965 showed that 85% of overall variation in domestic credit to private sector (DCPS) is accounted for by the explanatory variables: international remittance inflows (IRIGWT), real gross domestic product (RGDP) overseas development assistance (ODAGNI) exchange rate (EXR) and inflation (INF) while 15% of the changes in domestic credit to private sector can be attributed to other factors not included in the regression equation. F – Statistics = 8.615629, with p value of 0.000020 which is less than 0.05 shows that explanatory variables jointly influence dependent variable significantly. Result of DW which stands for Durbin Watson is used to determine if there is autocorrelation among residuals, since the DW has the value of 2.06; it indicates the absence of auto correlation among the residuals.

5.4 Causality Test

The VEC Granger test was adopted to evaluate the degree of causality between international remittance and economic growth in Nigeria as expressed in the first hypothesis. From the result, the p values of 0.3187 and 0.2399 respectively are greater than 0.05; therefore, the study accept the null hypothesis and concludes that causality does not run between international remittance inflows and real gross domestic product in Nigeria. This is contrary to the outcome of the error correction term. A negative error correction term implies causality among the dependent and independent variables as it is indicative of the speed of adjustment from the short run to long run equilibrium in the event of distortions in the economy.

Implication of the Results

The literature is divided on the effect of international remittance inflows on the growth of the domestic economy. While the optimistic theorist together with the altruistic and self interest motive theorist contend that international remittance should benefit the recipient economy, the pessimistic, neo Marxist and dependence theorist argue to the contrary. The researcher has analyzed the implications of the result in line with the tested hypotheses discussing the results as it affects the Nigerian economy as shown below.

(i) International Remittance Inflows and Economic Growth in Nigeria:

The result of the VECM in the first model of the study showed a negative significant relationship between international remittance inflows and real gross domestic product in the short run as indicated by a t-statistics of -6.874905 and a p-value of 0.0087. This means that international remittance inflows contribute negatively to the growth of Nigeria's economy. This result agrees with the views of the pessimistic, neo Marxist and dependence school of thought who believes that international remittance inflows does not contribute positively to the economy of the recipient country. The finding also agrees with Kaasschieter [11] and Agu [3] who discovered negative relationship between international remittance and economic growth. The researcher is of the opinion that the attitude of recipients of international remittance could be responsible for this outcome. It has been argued that most international remittance especially to developing economies are usually consumed rather than being invested on productive ventures even as such free fund discourages the recipient from engaging in productive activities. Consequently, from the upper chambers of the VECM, international remittance inflow maintained a negative relationship with economic growth in the long run, implying that even in the long run,

international remittance inflow has not been beneficial to the Nigerian economy

(ii) Causality between International Remittance and Growth of Nigerian Economy: The error correction term from the first model of the study is negative, significant and fractional.

A negative error correction term implies causality among the dependent and independent variables as it is indicative of the speed of adjustment from the short run to long run equilibrium in the event of distortions in the economy. This is contrary to the result of the Wald test which indicated no causality among RGDP, IRIGWT, ODAGNI, BOT and INF. This implies that policy actions to manage international remittance inflow into the domestic economy could be discretionary. An increase in international remittance inflow can contribute to the growth of the economy if appropriate policy actions are taken to remedy possible gaps in remittance transmission process. The growth of the domestic economy can also assist in addressing negative issues associated with international remittance inflows, since a developed economy absorbs the best hands and saves such economy from brain drain.

(iii) International Remittance Inflow and the Growth of Credit to Private Sector in Nigeria: The result of VECM in the second model of the study showed a positive insignificant relationship between international remittance inflows and domestic credit to private sector in the short run within the period under consideration with a t- statistics of 0.053623 and p-value of 0.6807. This implies that though the contribution of international remittance to the growth of credit to private sector is positive, the impact is not felt in the economy. A possible explanation to this outcome could be the manner international remittance is transmitted to the recipient economy. Evidence suggest that most international remittance does not pass through the official channel for fear of being taxed hence avoiding the financial sector and even when the fund is received, most recipients after the process of currency conversion tend to spend their money directly. The financial sector in most cases is avoided in the transmission process and consequently denied the necessary impact this would have created in the creation of credit to the private sector of the Nigerian Economy. However, from the upper chamber of the VECM in the second model, international remittance inflow indicated a negative relationship with domestic credit to private sector in the long run, implying that it does not contribute to growth in credit to private sector in the long run.

(iv) Overseas Development Assistance and the Growth of Nigerian Economy: The result of the error correction model in the short run as

indicated by the lower chamber of VECM showed a positive significant correlation between overseas development assistance and gross domestic product as indicated by the t-statistics of 8.643742 and p-value of 0.0097. This means that overseas development assistance contributes significantly to the growth of the Nigerian economy in the short run.

However, the result from the upper chamber of the VECM indicates a negative relationship between overseas development assistance and economic growth in the long run. The implication of this result is that policy makers should promote overseas development assistance in the short run in preference to long run planning if the economy will reap the fruit of such investment.

Summary

This study considered the impact of international remittance inflows on the growth of domestic economy in Nigeria in addition to how such inflows has contributed to the growth of credit to the private sector. The researcher adopted co integration, vector error correction model and Wald test econometric procedure in the analysis of the data collected from central bank of Nigeria statistical bulletin (2015). The following results were found after the estimation of the hypothesis of the study.

The result of the Johansen co integration test for real gross domestic product and international remittance inflow, overseas development assistance, balance of trade and inflation indicated four (4) co integrating vectors. Also, the result of the Johansen co integration test for domestic credit to private sector, international remittance inflows, real gross domestic product, overseas development assistance, exchange rate and inflation also revealed four (4) co integrating equations

The result of the VECM in the first model of the study showed a negative significant relationship between international remittance inflows and real gross domestic product in the short run as indicated by a t-statistics of -6.874905 and a p-value of 0.0087. Consequently, from the upper chambers of the VECM, international remittance inflow maintained a negative relationship with economic growth in the long run.

The Wald test indicated no causality among RGDP, IRIGWT, ODAGNI, BOT and INF.

The result of VECM in the second model of the study showed a positive insignificant relationship between international remittance inflows and domestic credit to private sector in the short run within the period under consideration with a t-statistics of 0.053623 and p-value of 0.6807. However, from the upper chamber of the VECM in the second model, international

remittance inflow indicated a negative relationship with domestic credit to private sector in the long run.

The result of the error correction model in the short run as indicated by the lower chamber of VECM showed a positive significant correlation between overseas development assistance and gross domestic product as indicated by the t-statistics of 8.643742 and p-value of 0.0097. The result from the upper chamber of the VECM indicates a negative relationship between overseas development assistance and economic growth in the long run.

CONCLUSION

This study considered the impact of international remittance inflows on the growth of domestic economy in Nigeria, in addition to how such inflows has contributed to the growth of credit to the private sector. The researcher adopted co integration, vector error correction model and Wald test econometric procedure in the analysis of the data collected from central bank of Nigeria statistical bulletin (2015). The following results were found after the estimation of the hypothesis of the study.

The result of the Johansen co integration test for real gross domestic product and international remittance inflow, overseas development assistance, balance of trade and inflation indicated four (4) co integrating vectors. Also, the result of the Johansen co integration test for domestic credit to private sector, international remittance inflows, real gross domestic product, overseas development assistance, exchange rate and inflation also revealed four(4) co integrating equations

The result of the VECM in the first model of the study showed a negative significant relationship between international remittance inflows and real gross domestic product in the short run as indicated by a t-statistics of - 6.874905 and a p-value of 0.0087. Consequently, from the upper chambers of the VECM, international remittance inflow maintained a negative relationship with economic growth in the long run

The Wald test indicated causality among RGDP, IRIGWT, ODAGNI, BOT and INF.

The result of VECM in the second model of the study showed a positive insignificant relationship between international remittance inflows and domestic credit to private sector in the short run within the period under consideration with a t- statistics of 0.053623 and p-value of 0.6807. However, from the upper chamber of the VECM in the second model, international remittance inflow indicated a negative relationship with domestic credit to private sector in the long run.

The result of the error correction model in the short run as indicated by the lower chamber of VECM showed a positive significant correlation between overseas development assistance and gross domestic product as indicated by the t-statistics of 8.643742 and p-value of 0.0097. The result from the upper chamber of the VECM indicates a negative relationship between overseas development assistance and economic growth in the long run.

In view of the above findings, the study makes the following recommendations;

The federal government should adopt strict policy measures to regulate international remittance inflows to Nigeria by ensuring proper investment of greater percentage of all remittances. This can be done by insisting that all remittance above certain level be accompanied with an investment plan or properly taxed.

In order to encourage remittances passing through the official channel, the Central Bank of Nigeria should ensure that transaction cost of international remittance inflows are kept very minimal.

This research concludes that international remittance inflows has not contributed positively to the growth of Nigerian economy; just as it contributed insignificantly to the growth of domestic credit in the economy within the period of the study.

Recommendations

In view of the above findings, the study makes the following recommendations;

The federal government should adopt strict policy measures to regulate international remittance inflows to Nigeria by ensuring proper investment of greater percentage of all remittances. This will stimulate growth in the economy and create employment. This can be done by insisting that all remittance above certain level be accompanied with an investment plan or proper tax.

In order to encourage remittances passing through the official channel, the Central Bank of Nigeria should ensure that transactionary cost of international remittance inflows are kept very minimal.

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To cite this article:

Titus Chinweuba Eze. Modeling the Relationship between Remittance Inflows and the Growth of Nigeria's Domestic Economy: VEC Granger Causality Test Approach. *Journal of Money, Banking and Finance*, Vol. 6, No. 2, 2020, pp. 99-122