Does Remittance income Spur Food Imports? Evidence from a Developing Country

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Abstract: As a source of foreign earning, remittance income has been considered to be a financial resource which could be utilized to pursue economic development goals. This study therefore examines the effectiveness of remittance income on food importation in Nigeria using time-series data for the period 1977 to 2019. The study employed the auto-regressive distributed lag (ARDL) estimation technique to achieve the aim of the study. Results from the analyses indicate that remittance income has a negative impact on food importation both in the short-run and long-run. We therefore conclude that remittance inflows do not play a crucial role in increasing food import. Nigeria can benefit from it by investing remittance in productive investment that will have a positive effect on domestic agricultural productivity. Additionally, policy that discourages food importation in favour of domestic agricultural production could be promoted. These include ban or increase in tax of selected food imports where Nigeria has a comparative advantage and a consideration for the devaluation of real effective exchange rate to curtail food importation.

Keywords: Remittance; Food Import; Food Security; ARDL; Nigeria

JEL Classification: F24; F22; F10; B22

1. Introduction

The Migrant remittances to developing nations have been increasing in proportion (Mabrouk & Mekni, 2018). Evidently, home countries of migrants from Africa have experienced a large inflow of remittance funds, which has become either a primary or secondary sources of income for the recipients in the past few decades. The share of remittance in GDP in many developing countries is huge. In spite of occasional global economic downturn in some countries, increasing inflow of remittance to the Global South has been recorded over the decades (Sirkeci, 2017). This constitutes the private savings of migrants being transferred to families, relatives and friends in the home country to augment their low income.

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In contrast to other sources of foreign earnings and funding like foreign aids (ODA), foreign direct investment (FDI) and debts from both domestic and international institutions, remittance forms a veritable source of income for developing countries to fund developmental projects at near zero interest rate. Since remittances are private transfers, it could be tasking to know the actual amount transferred and how it is used due to low and unsophisticated financial system in several of this less developed and developing countries.

World Bank (2019) reported that $529 billion was the annual remittance inflows to middle and low-income countries in 2018 (Ratha et al., 2019). This confirms the suggestion that remittances are increasing sources of sustainable source of overseas currency for poor countries when compared to ODA and FDI. Previously, remittances inflows to the developing country rose by 6.3 percent up from 2012 to $414 billion in 2013. Remittances can be seen as both economic and social. Economic remittance is well understood as monetary pecuniary, social remittance comes as result of migration which leads to sharing of ideas, culture, values, behaviours and identities. These are social capital that contributes to promoting the income of receiving countries in form of skills transfer and entrepreneurship, (Levitt, 1998).

Thus, this inflow is typical of any windfall such as sudden surge in oil revenue resulting from rise in oil price. This often leads to spending on luxury goods and unplanned projects. However, one of the challenges with remittance as a source of income is the tendency for a country to depend and plan on it as a means of sustenance and expanding trade import. To this end, we seek to provide an insight to know if remittance is already resulting into increased food imports which will invariably affects the Agricultural sector. The importance of this study is to provide a policy insight into the consequences of a sharp drop in inflow of remittance as a result of possible global economic downturn after the pandemic. Aside the loss of revenue, increased unemployment could be occasioned if food imports are spurred by remittances.

Further, another drawback of remittances is the tendency to increase recipients' consumption, especially the propensity to import goods and create a disincentive to work (Azam & Gubert, 2006). Accordingly, Barajas et al.; (2011) and Kireyev, (2006) opined that increased consumption as occasioned by rising inflow of remittances could have macroeconomic consequences on the economy. This include; rise in domestic market prices and inflation; appreciation of the exchange rate and temporary current account deficit.

The stock of migrants internationally has been increasing over the past decades. It was 86 million migrant workers in 2009. This is expected to rise to about 405 million persons by 2050. The direction of movement which may be due to the ease of crossing international borders is more of regional migration. While the Global

South-North movement, United States of America, Canada, Germany, Switzerland, Saudi Arabia, Qatar, United Arab Emirates, Spain, Italy and Kuwait are countries of destinations. The resilient and vibrant labour market has made it an attractive destination for job seeking migrants. In terms of strength of quantity of remittances, US, Russian Federation, Saudi Arabia and Switzerland takes the lead in 2008 with US having the largest source of remittance in 2008 of $46 billion (UNCTAD, 2013). It is important to understand that huge inflows of remittances could lead to increase in money supply which could in turn results into inflation in the economy. In addition, it can lead to domestic currency appreciation due to inflow of foreign currency. One of the macroeconomic implications of high value of domestic currency is a rise in import demand of variety of commodity which includes food imports. Remittances drive growth both at domestic front and places where the remittance emanates. Funds are made available in the home countries for economic activities, but it may also find its way back into the economy of the developed countries via import spending. The important thing therefore, is for developing countries to ensure that policies are developed to help in efficient utilisation of this external source of fund for economic growth. However, the challenge over time in many developing countries generally, and in Nigeria specifically, is that the huge inflows of this fund could not be tied to the growth trajectory of the economy. Little is known about food imports and remittances relationships in Nigeria. We therefore seek to provide empirical evidence to how remittances over the past few decades, has contributed to government policy in relation to increasing or decreasing food imports. Does increasing inflows of remittances leads to the changes in food imports?

2. General Organization of the Paper

The rest of the paper is organized as follows; in section three we provided some stylized facts on remittances and imports trend in Nigeria. Section four focuses on a brief review of the extant literature. Section five presents the methodology and data issues. In Section six, we discuss our results and major findings from the study. Finally, the conclusion and policy implications were discussed in Section seven.

3. Stylized Facts and Trend Analysis

The increasing number of international migrants globally has increased the migrants' remittances to home countries. The main country of destination for international migrants is the United State of American. Other countries where larger proportion of migrants reside include Germany, Saudi Arabia, Russia,

United Kingdom, Italy, Spain and the UAE among others. According to World Bank (2018), remittance in 2018 was US$689 billion. This is a rise from US$613 billion in 2017. Again, there is a further increase by 7 percent from US$573 billion in 2016 (Yeboah, Boamah and Appai, 2019). Sub-Saharan Africa share of remittances has been increasing over the years. This increased to 1.6% in 2004 from 0.9% in 1994. It rose to 2.3 % in 2014 (Keho, 2020). Intuitively, it can be inferred that increasing number of migrants are skilled workers which strengthen their earning ability over the years. The trend is not quite different in Nigeria; the country is also one of the highest recipients of remittances globally. Figure 1 shows that migrant remittance inflows have been increasing in the past few years. Interestingly, between 1977 and 1991, remittances were very few. Perhaps, the economy was still relatively much viable and the population was also relatively fewer compared to today. Besides, travelling abroad at those earlier years was for education, rather than for greener pasture. However, the trend in remittances begins to rise gradually since 1992 to more than $25 million. More than 17 million Nigerians abroad have been able to send money back home up to a total of US$96.5 billion between 2012 and 2018 only. Inflows of remittances in Nigeria which was US$5.66 billion in 2010, rose to US$17.58 by 2019, there was sharp drop in 2013 by US$2.21. A number of factors could have accounted for this fall, which could include the level of economic performance in the country. More of these remittances are from US, UAE, China, Switzerland and Europe among others. A huge of this remittance comes from the US, accounting for 30 percent of all remittance into the country. According to the National Bureau of Statistics (NBS) reports, remittances inflow increased to over $25 billion in 2018 from $3.24 billion in 2013. It accounts for 5.74 percent of GDP in 2018. This is 126% increase during the period under consideration.

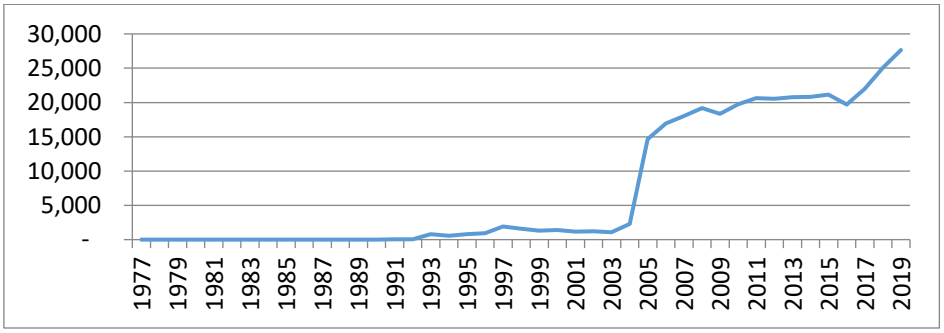

Figure 1. Nigeria's Migrants Remittance Inflows (US$ Million).

Source: Authors' Computation, 2020.

Food imports as a percentage of merchandise imports was 10.93 percent in Nigeria in 2018 according to the World Bank (2020). Statistics from the Central Bank of

Nigeria indicates that an average food import of N1.92 trillion per year between 1990
and 2011. N54.51 trillion was spent from 2016 to June 2019 on importation of foods, agricultural and manufactured goods in Nigeria.
The rising trend in importation by Nigerians has necessitated the imposition of restriction to accessing foreign exchange required for food import. Just as the recent land border closure, it is a policy drive to promote Agriculture productivity in the country.
In Figure 2, food imports have been fluctuating since 1977. A rise in 1977, reaches the pick in 1983 before nose-diving into a negative threshold in 1993. The different government policies to revamp the Agricultural sector and curtail importations, coupled with the exchange rate fluctuation could have accounted for this sharp fall. However, it began to rise in 1996 again. There have been different spikes in rise of food importation subsequently.

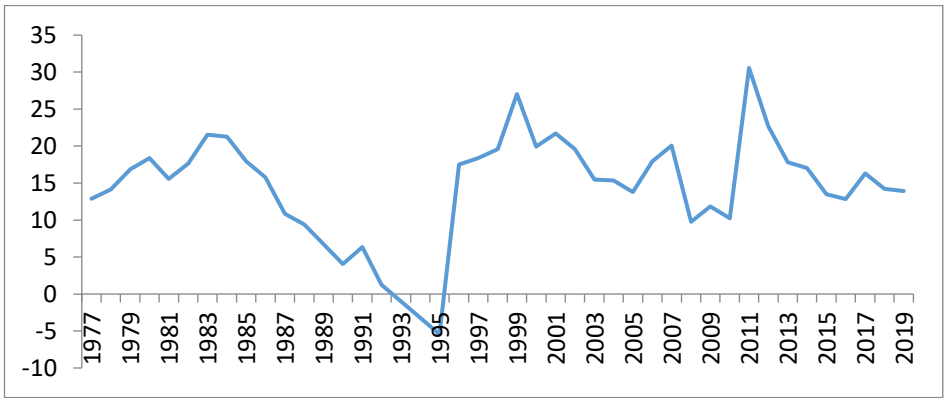

Figure 2. Food Imports (% of Merchandise Imports).
Source: Authors' Computation

The government have been worried and concerned about the increasing food imports at the expense of local food production. This is the bases of argument in support of government policy in restricting imports generally.

3. Conceptualization and Brief Empirical Review

The theoretical underpinnings for the remittance impact on the economy are premised on the argument that remittances causes income effect by reducing supply of labour. This is because of the extra source of income assuming that leisure is a normal good and there is no overpopulation in the recipient country. Aggregate demand is expected to rise due to increase in income from remittances. Income can also rise as result of labour supply shortfall which raises wages and thus, inducing recipient receiving household to supply their labour. Aggregate

demand curve shifts outwards. The increase in income could induce the propensity to import depending on the prevailing economic situation at a particular time (Orrenius et al.; 2010).

Remittance plays a vital role in spurring import demand in developing economies (Connell & Conway 2000). This is because it is an important source of foreign exchange for settlement of import liabilities (Azad, 2005). Previous studies have shown that remittances have positive impact on households spending including food expenditure (Adams & Cuecuecha, 2010a; Quisumbing & McNiven, 2010). However, the total effect of remittances on the economies of both receiving and remitting countries is still unclear.

Some studies argued that the impact on the receiving countries is both negative and positive (Alkhathlan, 2013; Lartey et al.; 2008; Konte, 2018; Donou-Adonsou & Lim, 2015). Others have opined that there are no empirical effects (Barajas et al.; 2009; Lim & Simmons, 2015). It is agreed in some quarters that remittance stimulates domestic consumption, and in some cases, consumption of imported goods. The policy of the government at every point in time will determine the direction of effects on the economy. Kumar et al.; (2018) suggest that remittances supports the growth of the countries of remittance by increasing aggregate demand which further stimulates the mobility of labour and reduction in employment in both countries (Boboc et al.; 2012). There is a positive relationship between remittances and marginal propensity to import (Khan et al, 2007). Zaman and lmrani (2005) found a positive impact of remittances on raw materials and import of capital goods but, no impact of remittances on the demand for imported consumer commodity.

The Johansen Cointegration test technique employed by Muktadir-Al-Mukit et al.; (2013) shows a statistically significant positive relationship between remittance and import. A unidirectional causality was found from import to remittance. This rather suggests that remittance has no significant impact on import demand. However, an empirical study by Barua et al.; (2007) found an inverse correlation between remittance inflow and inflation. Adams (2006) suggests that the magnitude of remittance is significant in determining the direction of remittance-induced spending. This implies that a small proportion of remittances coming to households are often spent on food consumption, whereas, larger inflows are spent on health-care, investment and imports. It follows that remittances expended on investment in domestic economy could help reduce import demand as opined by Glytsos (2005).

Another study argued that food consumptions of households with increasing inflows of remittance are higher than non-remittance receiving households (Adams and Cuecuecha, 2010b). Employing difference GMM and fixed effects panel, the result of the relationship between remittance inflows and external trade balance for

selected countries for a period of 21 years by Farzanegan and Hassan (2016), supports the fact that remittance inflows results into trade deficit which is occasioned by increased in consumption of imported goods. Adams (2006) found that the proportion of income from remittance-recipients spent on food is not larger when compared with the proportion spent on non-durable goods. A larger proportion is spent on healthcare, housing and education financing.

Atuoye et al.; (2017) found out that receiving remittances households show significant incidence of food security in both the rural and urban areas of Ghana. FAO, (2018) has also posited that the remittances utilization is primarily on foods expenditures. Food insecurity is a huge challenge in sub-Saharan Africa (20%) when compared with the North Africa (5%), (Rena, 2005). Mabrouk and Mekni (2018) investigated the link between international remittances and food security for African countries using panel data from 1990 to 2013. The study found out that the channel through which remittances impacts on food security include access-positive impacts; utilization and stability also showed a positive relationship, but availability indicated an inverse linkage.

Sulemana et al.; (2018) investigated the international remittances influence on household food security for more than 48,000 individuals with focus on 32 Sub-Saharan African countries. The main thrust from the analysis suggests that the regularity of international remittances is paramount in the determinant of food security in Sub-Saharan Africa. Thus, an increasing remittance ensures food security. However, the study failed to indicate the sources or channel through which remittances lead to food security, does it promotes domestic food production or encourages food import?

Lopez et al.; (2007) submitted that remittances and food import demand are positively correlated, because remittances are means of augmenting household income in the remittance-recipient countries. This is possible on one hand, because of the availability of foreign exchange by recipients. On the other, the channel of currency appreciation when there is inflow of foreign exchange, makes export dearer and import cheaper, thus spurs import demand, especially from countries with poor mechanized agriculture and food shortage (Barajas et al.; 2011).

Bussolo and Medvedev (2007) provide another empirical evidence to support the position that remittance inflow caused the demand for food imported to rise in Jamaica using a computable general equilibrium model. This is also consistent with the result obtained by Abdih et al. (2012). There is still no general consensus in the literature on the influence of remittance on food import. Thus, the main purpose of this study is to provide an empirical evidence of the potential relationship between remittances and food imports in Nigeria, since the major focus of previous studies were on remittances and imports in general.

4. Methodology

4.1. Model Specifications

The study adopts multivariate model specification and as well follow Ali et al. (2017) but, differs on the variables included in the model. The model specification indicating the relation between the variables of interest is expressed as follows:

$$lnFI_t = \alpha_0 + \alpha_1 lnR_t + \alpha_2 lnREER_t + \alpha_3 lnY_t + e_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (1)$$

Where FI_t is food import indicator; *R* is remittance income, *REER* is real effective exchange rate and *Y* is gross domestic product per capita. All variables are in natural logarithm form.

4.2. Analytical Techniques

The ARDL specification of the general empirical model in eq. (1) is expressed as follows:

$$\begin{aligned}\Delta lnFI_t = \alpha_0 &+ \sum_{i=1}^{n} \alpha_{1i} \Delta lnFI_{t-i} + \sum_{i=1}^{n} \alpha_{2i} \Delta lnR_{t-i} + \sum_{i=1}^{n} \alpha_{3i} \Delta lnREER_{t-i} \\ &+ \sum_{i=1}^{n} \alpha_{4i} \Delta lnY_{t-1} + \delta_1 lnFI_{t-1} + \delta_2 lnR_{t-1} + \delta_3 lnREER_{t-1} \\ &+ \delta_4 lnY_{t-1} + \varepsilon_{it} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (2)\end{aligned}$$

Following the ARDL co-integration test which is based on equation (2), the ARDL-based error correction model of the general empirical model is also expressed in equation 3 as follows:

$$\begin{aligned}\Delta lnFI_t = \alpha_0 &+ \sum_{i=1}^{n} \alpha_{1i} \Delta lnFI_{t-1} + \sum_{i=1}^{n} \alpha_{2i} \Delta lnR_{t-1} + \sum_{i=1}^{n} \alpha_{3i} \Delta lnREER_{t-1} \\ &+ \sum_{i=1}^{n} \alpha_{4i} \Delta lnY_{t-1} + \gamma_{1i} ECM_{t-1} + \varepsilon_i \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (3)\end{aligned}$$

4.3. Data

The study uses annual time-series data from 1977 to 2019 to investigate the impact of remittance on food import. The data on food import, remittance, real effective exchange rate and gross domestic product per capita were obtained from the World Bank Development Indicator. E-view 10 was used to analyze the data.

5. Empirical Results and Discussion

5.1. Order of Integration and Co-integration Test Results

Following the criteria that intended variables needed to be integrated in the order of I(0) or I(1) to be able to apply the ARDL-Bound test cointegration technique, the integrated orders of the variables were examined using the Phillips-Perron unit root test measure, and results are presented in Table 3. As shown in the Table 3, there is a sufficient reason to conclude that the level form of the series is not stationary. Consequently, the tests were conducted at first-difference for each of the variables. The results of the unit root tests indicate that the series are stationary at first difference at 1 percent significance level. This confirmed that none of the variables (lnFI, lnR, lnRER and lnGDP) are integrated at order above I (1). This further confirms that the ARDL co-integration technique can be applied on the data.

Table 3. Order of Integration

Variables	Phillips-Perron				
	Level		First Difference		Decision
lnFI	-2.3351	0.1662	-6.2132	0.0000	I(1)
lnR	-0.6019	0.8593	-7.6385	0.0000	I(1)
lnREER	-1.8845	0.3362	-4.8085	0.0003	I(1)
LnY	0.1241	0.9639	-6.0008	0.0000	I(1)

Source: Computed by Authors

As stated earlier, the Bound test co-integration technique was carried out to ascertain the existence of co-integrating relationship among the variables or not by comparing the computed F-statistic with the critical values. However, Amusa and Oyinlola (2019) noted that determining an optimal lag length for the ARDL model is imperative considering the sensitivity of the value of F-statistics to the number of lag imposed on the differenced variables. Consequently, the AIC was employed to determine the optimal lag order for the model, and this is indicated to be ARDL (4, 2,0,2).

The result of the Bound test for the model is presented in Table 4. The result shows that the F-statistic (lnFI, lnR, lnREER and lnY) is 7.95, and it is higher than upper bounds critical value at all levels of significance. This result warrants the rejection of the null hypothesis of no co-integration among the regressands specified in equation 2, and concluding that there is an existence of long-run relationship among the variables.

Table 4. Test of Cointegration- F-Bound Test

Test Statistic	Value	Significance	I(0)	I(1)	**Conclusion**
F-Statistic	7.95	10%	2.37	3.2	Co-integration Exist
K	3	5%	2.79	3.67	
		2.5%	3.15	4.08	
		1%	3.65	4.66	

Source: Computed by Authors

5.2. Short and Long-Run Estimation Results

Table 5 presents the results of the estimation of the short-and long-run coefficients and the result of diagnostics tests of the model. Table 5 shows that the error correction term (ECT) for the model is -0.4612 which indicates that a shock to the model in Equation (1) results in a low convergence to equilibrium, with about 46 percent of adjustment occurring in the first year.

The elasticity of net effect of remittance on food import was negative irrespective of the period of time. Specifically, in the short-run, coefficient value of remittance is - 0.1206, same negative effect is obtained after first year lag at -0.2286. The values suggest that if all other variables were held constant, one percent increase in remittance from migrant will reduce food import by 0.12 percent and 0.22 percent respectively. Similar negative effect is observed would occur over a longer period as well at -0.19 percent for every one percent increase in remittance income, though it is not significant. A plausible reason for this finding is the economically productive use of international remittance in the country. Such that recipients of remittance rather use remittance to invest in physical capital (real estate and small scale business), human capital (education and health) and financial capital (saving and fixed deposit) rather than expend it on food consumption as noted by Niaz, et al. (2010) and Ali et al (2017). This plausible reason is that remittances have a positive impact on import of capital goods and raw materials, and this is consistent with the finding of Zaman and lmrani (2005). The findings also show that the first and second time lags of food import are negative and statistically significant at the 5 percent level in the short-term, respectively. Whereas the third time lag is statistically positive. This imply that a percentage change in the past realisations of food import is associated with about 0.27 and0.31 percentage decrease in current level of food import, ceteris paribus.

The results also showed that real effective exchange rate is an important factor that could influence food importation in the process of making Nigeria a food secure nation. The computed long-run elasticity of real effective exchange rate is positive and significant (REER = 1.29, $p<0.05$). This suggests that food import would increase by about 1.3 percent in the long-run if there is an increase or appreciation of the real effective exchange rate other thing being equal. It can be deduced that the appreciation of the exchange rate which is an outcome of substantial entry of

foreign currency through oil exports could lead to an increase in food imports volume and the settlement of emanating bills. These results are consistent with those obtained by Safoulanitou and Ndinga (2010) and Ali et al.; (2017) for Congo and Pakistan. The effect of income is positive and statistically significant after a one-year lag period in the short-run but an insignificant negative effect is found.

The effect in the short-run is also higher when compare to the effect in the long-run as well as examined other variables in the short-run. The possible explanation of the positive short-run effect is the increased purchasing power to purchase foreign goods, including food. Equally, increased income increases domestic demand for a limited available amount of food in the economy, this further necessitate food supplier to rely on imported food to meet domestic demand. This finding is consistent to the study of Ali et al. (2017), Hyuha et al.; (2017), Baiyegunhi and Sikhosana (2012) carried out in Pakistan, Uganda and South Africa respectively. In the study of Baiyegunhi and Skkhosana (2012) where a double logarithm linear function was employed, an import demand for wheat was found to be income-elastic, that is, an increase in disposable income of consumers have a positive and significant relationship with import of wheat in South Africa.

Table 5. Short-run and Long-Run Coefficient Estimates, ARDL (4.2.0.2)

Variables	Coefficients	S.E
Short-run Estimate		
Δ(*ln*FI(-1))	-0.2660***	0.1362
Δ(*ln*FI(-2))	-0.3053**	0.1411
Δ(lnFI(-3))	0.2467**	0.1199
Δ(*ln*R)	-0.1206	0.0837
Δ(*ln*R(-1))	-0.2286**	0.0848
Δ(*ln*Y)	0.3890	0.2760
Δ(*lnY*(-1))	1.1794*	0.2854
Ect	-0.4612*	0.0683
Long-run Estimate		
*Ln*R	-0.1895	0.1121
*Ln*REER	1.2995**	0.5217
LnY	-0.4266	0.3357
C	-2.1635	1.8803
Model Diagnostics		
$R^2 = 0.62$		
Adjusted $R^2 = 0.53$		
Durbin Watson= 2.06		
Jarque-Bera: 2.344 (0.310)		
Breusch-Godfrey Serial Correlation LM Test: F-Statistic =1.206; Prob. F (2,25)= 0.3165		
Heteroskedasticity- Breusch-Pagan-Godfrey: F-Statistic =0.870; Prob. F (11,27)= 0.5781		

Source: Computed by Authors

The main concern is the fact that food import is an unproductive import, and together with the increased foreign earning through oil export revenue which is used to settle food import bills makes the Nigerian economy vulnerable to international shocks. Also, increased food importation as a result of appreciation of the real effective exchange rate and increased per capita income negates the drive for food self-sufficiency of the country through improved domestic agricultural production. Normality, serial correlation and heteroskedasticity diagnostic test were conducted in order to establish the reliability and soundness of the estimated model. The Jarque-Bera test for normality of 2.344 (0.310), indicates that the estimated residual series are normally distributed, therefore the null hypothesis of none normal distribution of residual series is rejected. The LM statistic of 1.206 (0.3165) supports the rejection of presence of serial correlation. The Breusch-Pagan-Godfrey test for heteroskedasticity of 0.870 (0.5781) also indicates that residual do not suffer from heteroskedasticity. Additionally, the CUSUM and CUSUM of squares tests results (though not presented) respectively shows stability of the study model.

6. Conclusion and Policy Implication

The study analysed the role of remittance in the food importation in Nigeria using time series data from 1977 to 2019 using the auto-regressive distributed lag (ARDL) bounds testing estimation technique. Among others things, the results revealed that remittance is a negative predictor of food importation in both the short-run and long-run, but more significant in the short-run. Income and real effective exchange rate were found to have positive effects on food import in the short-run and long-run respectively. Since food importation is mainly to promote food availability in an economy and remittance was not found to promote food import as shown in this study, therefore policy actions that will promote or encourage diversion of international migrant remittance to the agricultural sector for stimulating domestic agricultural promotion is imperative. Equally, depreciation of real effective exchange rate, ban, as well as increase in tax on some selected imported food content is suggested in order to discourage food importation that is usually driven through appreciated real effective exchange rate and increasing income. This we believe will discourage importation while promoting domestic production, and as well enable the government to fund domestic agricultural investment through foreign earning from oil export.

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