PRINT ISSN 1119-8362
Electronic ISSN 1119-8362

Full-text Available Online at
https://www.ajol.info/index.php/jasem
http://ww.bioline.org.br/ja

J. Appl. Sci. Environ. Manage.
Vol. 24 (5) 923-931 May 2020

Determinants of Rice Import Demand in Nigeria

*[1]YUSUF, WA; [1,3]YUSUF, SA; [2]ADESOPE, AAA; [3]ADEBAYO, OZ

*[1]Department of Economics, Nile University of Nigeria, FCT Abuja
[2]Forestry Research Institute of Nigeria (FRIN), Jericho, Ibadan
[3]Department of Agricultural Economic, University of Ibadan, Nigeria
*Corresponding Author Email: ywasiu40@gmail.com

ABSTRACT: Primarily, the study examined the determinants of rice import demand in Nigeria by assessing the short run and long run dynamic model relationships among the determinants, trends and extent of causality among per capita income, population, exchange rate and price of rice imports were equally examined, using data obtained from the Central Bank of Nigeria (CBN) and National Bureau of statistics (NBS) over the period 1961 to 2013. Data obtained showed the perceived determinants of imports demand for rice in Nigeria were local rice production, rice import price, rice consumption, per capita income, and exchange rate, price of local rice, domestic stock variation, maize price, meat price and demographic development. The short run dynamic model result showed that rice consumption, price of meat, price of maize, local rice quantity, demography development and stock variance are statistically significant at 5%. The significance of the coefficient of the error correction term confirmed the appropriateness of the error correction approach which also showed that ignoring the long run relationship is detrimental. The result however, revealed that rice import demand increases significantly with increasing rice consumption, increasing price of meat, increasing price of maize (keeping that for imported rice unchanged) and increasing demography development. Rice import price, per capita income, price of local rice and exchange rate had no significant effects on rice import demand. The study therefore recommends that locally-produced rice should be intensively improved.

DOI: https://dx.doi.org/10.4314/jasem.v24i5.30

Dates: Received: 10 March 2020; Revised: 29 April 2020; Accepted: 28 May 2020

Keywords: demography, determinants, Error correction mechanism, rice import demand

Rice forms a significant portion of food consumed in most households in Nigeria, it has remained one of the most important cereals and staple food stuffs in Nigeria (Akpan *et al.,* 2014; and Erhabor and Ojogho, 2011). Isa *et al.,* 2013 observed that rice is one of the few food items whose consumption has no cultural, religious, ethnic or geographical boundary in Nigeria, and constitutes one of the major staples, which can provide a nation's population with the nationally required food security minimum of 2,400 calories per person per day (Bamidele *et al.,* 2010). The study also asserted that the demand for rice has been increasing in Nigeria at a much faster rate than domestic production and more than in any other African countries since mid-1970s due to its increasing contribution to the per capita calorie consumption of Nigerians. In some countries, the per capita consumption of rice is estimated at more than 100kg/ year. Estimates from FAO agricultural production database for Nigeria shows that, the gap between domestic demand of rice for food (as against feed and other uses) has widened since the late 1990s. Unfortunately, the domestic production of rice has not met the demand which led to food shortage problems. In a bid to address the demand/supply gap for rice, the government at various times had adopted and applied policies and programmes such as rice importation to supplement the local production which has continue to drain the country's hard earned foreign exchange earnings. With a population estimate of 174,507,539 persons and population growth rate of 2.54%, Nigeria happens to be not only the leading producer of rice in West Africa, but also among the leading importers of the commodity. Although endowed with a strong agricultural and natural resources base as well as favourable climatic conditions for agricultural production, an amount of about ₦1 billion is spent daily by Nigeria on importation of rice (Abubakar, 2013). FAO (2008) estimate also indicates that Nigerian rice import increases from 1876 tonnes in 1980 to 2630 million tonnes in 2002. The total import also stood at 1.9 million tonnes in 2003 (Central Bank of Nigeria (CBN), 2004). The Federal Government spent $2.41 billion on rice importation between January 2012 and May 2015 (Central Bank of Nigeria, 2015). Between 2010 and 2014, Nigeria imported about 10,876,148.3 tonnes of rice. All these have a huge financial implication on the economy and the development of the domestic potentials in the sub-sector. Rice imports have affected the domestic production and marketing of Nigeria's local rice as a result of decrease in the demand of local rice by Nigerians. As a response to the prevailing rice supply deficit situation in Nigeria, successive Nigerian governments intervened in the rice sector through the establishment of parastatals and policies since 1970;

*Corresponding Author Email: ywasiu40@gmail.com

among which were Agricultural Development Projects (ADP) 1975, Operation Feed the Nation (OFN) in 1976, the River Basin Development Authority (RBDA) 1977, the Structural Adjustment Programmes (SAP) 1986, and the Presidential Initiative on Increased Rice Production, Processing and Export (PIIRPPE) 2001. The emergence of the VEETEE rice company in 2004 was another way to boost local rice production in Nigeria. The company has the facility for polishing rice, which means high quality of local rice (Bamidele, *et al.,* 2010); all these were aimed at encouraging and boosting local rice production. However, in spite of these numerous programmes rice importation continue to increase because rice has become a strategic commodity in the Nigerian economy, therefore there is pertinent need to empirically assess the determinant of rice import demand in Nigeria.

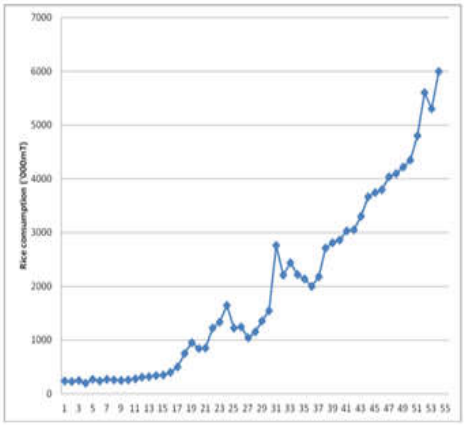

Fig 1: Rice Consumption Trend 1960(T =1) to 2013 (T = 54)

Though rice contributes a significant proportion of the food requirements of the population, production capacity is far below the national requirements for rice (Wudiri and Fatoba, 1992; and Ladebo, 1999). Nigeria is currently the largest rice importer in the world. As demand for rice rises in Nigeria, it is clear that production has failed to keep pace while the gap has been bridged by growing imports. Rising consumer preference for rice has increased demand at a faster rate than population growth. According to Oluyemisi 2013, per capita production has remained stagnant at about 28 kg/person since 1990. This is in sharp contrast to Mali, Ghana and Senegal where it has doubled or even tripled over the same period. As a result, while Nigeria contributes the most to total production in the region, its share has declined by 10 percentage points since the early 1990s, from 47.7 to 37.5 percent. The Nigerian rice economy has lagged behind these three countries and others in the region.However, in response to the continuing demand for imported rice, the Nigerian government has embarked on several policy reforms, ranging from quantity restriction, ban, tariff, and trade liberalization. Similarly, prior to1997, the government strategy to maintain rice self-sufficiency level has been through direct support to producers by providing fertilizer subsidies to farmers and consumers through price controls, now having complied with WTO trade agreements, these subsidies have been dismantled, and the country faces new challenges of sustaining a viable rice industry to meet national self-sufficiency targets. Over the years, the country has continued to depend on importation of rice to meet the demand and preference for her teeming population. Available study (Emodi and Madukwe, 2011) revealed that Nigeria is the largest importer of rice in the world. Although increase in rice imports for Nigeria is of greater concern to the government and rice producers in the country, however, only a few studies has been carried out on the determinants of rice imports in Nigeria, Okeowo (2016) worked on Aggregate Import Demand Analysis ,of Rice in Nigeria, Sunday *et al* 2015 worked on Roles of Political and Economic Environments on Agricultural Commodity Import Demand in Developing Economy: A Case Study of Rice Sub-Sector in Nigeria, Ogundele (2007) worked on assessing trade liberalization and import demand for rice in Nigeria while Nkang *et al*. (2006) worked on a study on "rice production, imports and food security in Nigeria. Also some efforts have been made so far at the national level, which have placed emphasis on identifying the determinant of aggregate imports in Nigeria for example Determinants of Nigeria's Non-Oil Import Demand by Aladejare and Abdulwahab (2014), Determinants of food imports demand and policy shift in Nigeria 1960-1998 by Udoh *et al*. (2001).

Several investigations carried out so far into identifying the determinants of rice and other food imports in Nigeria have gone beyond simple associations by covering different variables including local production (output) of the imported commodity, total import value, external reserves, exchange rate, and industrial capacity utilization, among others. Worthy of note are studies on determinant of rice import demand; roles of political and economic environments on rice import demand by Sunday *et al*., 2016, effects of various trade policy instruments such as tariff, import restrictions, outright ban on rice import and other determinants on the import demand for rice in Nigeria by Ogundele 2007, rice production, imports and food security in Nigeria by Nkang *et al.*; 2006. However, variables such as Price of rice complement, price of rice substitute, domestic stock variation and rice consumption were not included in all the past studies examined. Hence, the need to critically assess the determinants of rice import demand in Nigeria.

MATERIALS AND METHODS

Data for this study were secondary in nature and were sourced from Food and Agriculture Organization (FAO) and World Development Indicator (WDI). Data on volume and value of rice import, volume and value

of local rice, rice consumption, price of maize and meat and stock variance were gathered from FAO (FAOSTAT), while data on per capita income, exchange rate, consumer price index and population related data were gathered from development indicators of the World Bank. Also, the study employed analytical techniques such as descriptive statistics, unit root test, co-integration, error correction mechanism and granger causality. This study also pattern its model in line with Shehu and Aliyu (2007) which happen to be the most appropriate for this study. They employed the simple import demand model as developed by Khan (1974). This involves a co-integration and error correction modelling, using the Ordinary Least Squares regression (OLS) estimation technique, which were based on the simple linear relationship between rice imports as dependent variables and rice import price, per capita income, exchange rate, volume of local rice, price of local rice, total rice consumption, domestic stock variation, price of pseudo substitute, price of complement, demographic development and consumer price index as independent variables; the model specified a linear relationship between rice imports quantity (RMQ) as dependent variable, and Rice Import Price (RMP), Rice Consumption (RC), Per Capita Income (PCI), Exchange-Rate (EXG), Local Rice quantity (LRQ), Price of Local Rice (LRP), Domestic Stock Variation (DSV),Maize Price (MaP), Meat Price (MeP) and Demographic Development (DD). The functional rice import demand can be specified as;

RMQ = f(RMP, RC, PCI, EXG, LRQ, LRP, DSV, MaP, MeP, DD) (1)

Where: RMQ = Rice Imports Quantity; RC = Rice Consumption; PCI = Per Capita Income; EXG = Real Exchange-Rate; LRQ = Local Rice quantity; LRP = Local Rice Price; DSV = Domestic Stock Variation; MaP = Maize Price; MeP= Meat Price; DD= Demography Development Period, and f = functional notation. While "U" (the error term) was introduced to take care of variables not included in the model but affect rice import, equation (1) transforms to:

f(RMP, RC, PCI, EXG, LRQ, LRP, DSV, MaP, MeP, DD)

$$RMQ = \beta o + \beta_1 RMP + \beta_2 RC + \beta_3 PCI + \beta_4 EXG + \beta_5 LRQ + \beta_6 LRP + \beta_7 DSV + \beta_8 MaP + \beta_9 MeP + \beta_{10} DD + U \quad (2)$$

The dynamic model of equation (2) after expressing same in log-linear form as
supported by Thursby and Thursby (1984) is specified as;

$$l_n RMQ = \beta o + \beta_1 l_n RMP + \beta_2 l_n RC + \beta_3 l_n PCI + \beta_4 l_n EXG + \beta_5 l_n LRQ + \beta_6 l_n LRP + \beta_7 l_n DSV + \beta_8 l_n MaP + \beta_9 l_n MeP + \beta_{10} l_n DD + U \quad (3)$$

βo, $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7, \beta_8, \beta_9$ and β_{10} are the elasticities of Rice Import Price (RMP), Rice Consumption (RC), Per Capita Income (PCI), Exchange-Rate (EXG), Local Rice quantity (LRQ), Price of Local Rice (LRP), Domestic Stock Variation (DSV),Maize Price (MaP), Meat Price (MeP), and Demographic Development (DD). The study then sets the apriori expectation as $\beta_1, \beta_4, \beta_5, \beta_6, \beta_7, \beta_9 < 0$; $\beta_2, \beta_3, \beta_8, \beta_{10} > 0$; and $\beta_0 <= 0$

Furthermore, the empirical section examined the stationary conditions of the data by applying the augmented Dickey–Fuller (1979) and the Phillips-Perron (1988) test. Dickey and Fuller stretched the procedure of their test proposing an augmented version that contained more lagged term of endogenous variable to eradicate the autocorrelation.

$$\Delta Yt = \alpha_1 + \alpha_2 t + \delta y_{t-1} + \sum_i^m \theta \Delta y_{t-1} + \varepsilon_t \quad (4)$$

Yt = time series aggregate to be tested, t = time or trend variable, $\Delta yt = (Yt_{-1} - Yt_{-2})$, $\Delta yt_{-2} = (Yt_{-2} - Yt_{-3})$ etc,
ε_t= pure white noise error term, Δ= first deference operator, α_1= constant term, α_2= trend parameter,
δ = the parameter to be tested $\sum_i^m \theta \Delta y_{t-1}$= ADF term; it removes any possible autocorrelation between Δyt and ε_t

Equation (4) is the bench mark for the unit root model. Emphasis here was on the behaviour of the constant (α_1) and time parameter (α_2); they will provide information for the specification. Where both α_1 and α_2 are significant, then equation (4) will be justified as the true model. However, in a situation where α_2 is insignificant but α_1 is significant; equation (4) transforms to;

$$\Delta yt = \alpha_1 + \delta y_{t-1} + \sum_{i-1}^m \theta \Delta y_{t=1} + \varepsilon_t \quad (5)$$

If however the situation is the other way round, that is; α_1 is insignificant but α_2 is significant; equation (4) transforms to;

$$\Delta yt = \alpha_2 t + \delta y_{t-1} + \sum_{i-1}^m \theta \Delta y_{t=1} + \varepsilon_t \quad (6)$$

However, given that it has been established in the econometric modeling that trend is stochastic, we will here be faced with the decision to remove $\alpha_2 t$ from the model and trend becomes insignificant; when effected equation (6) reduces to;

$$\Delta yt = \delta y_{t-1} + \sum_{i-1}^m \theta \Delta y_{t=1} + \varepsilon_t \quad (7)$$

Equation (7) becomes the true general model for unit root test

Co-integration test was applied to find out the long run relationship between the used variables. It becomes a necessary requirement in any economic model using

non-stationary time series data. When non-stationary variables do not show co-integration then it would show spurious regression and econometric work becomes almost meaningless. On the other hand, if the stochastic trends do cancel, then we have co-integration which will then necessitate an error correction model (ECM). The ECM has the advantage of including both long-run and short-run information of the model.

Thus, y, x ~ I (1)

Where Y = rice import (dependent variable), X = vector of explanatory variables.

$Yt = \alpha_o + \alpha_1 Xt + Ut$ (8)

Linearly

$\tilde{U}t = (Yt - \tilde{\alpha}_o - \tilde{\alpha}_1 Xt)$ (9)

Cointegration exist if $\tilde{U}t \sim I(0)$

In the event of a long run relationship among the variables, equation (3) transforms into an error correction model specified as:

$$RMQ = \beta o + \beta_1 \Delta l_n RMP + \beta_2 \Delta l_n RC + \beta_3 \Delta l_n PCI + \beta_4 \Delta l_n EXG + \beta_5 \Delta l_n LRQ + \beta_6 \Delta l_n LRP + \beta_7 \Delta l_n DSV + \beta_8 \Delta l_n MaP + \beta_9 \Delta l_n MeP + \beta_{10} \Delta l_n DD - \lambda ECM_{t-1} + Vt \quad (10)$$

Where:

$$ECM = (\Delta l_n RMQ_t - \beta o - \beta_1 \Delta l_n RMP - \beta_2 \Delta l_n RC - \beta_3 \Delta l_n PCI - \beta_4 \Delta l_n EXG - \beta_5 \Delta l_n LRQ - \beta_6 \Delta l_n LRP - \beta_7 \Delta l_n DSV - \beta_8 \Delta l_n MaP - \beta_9 \Delta l_n MeP - \beta_{10} \Delta l_n DD)_{t-1}$$

λ= Adjustment parameter which shows the extent to which the disequilibrium in the dependent variable (ΔlnRMt) is being corrected each period.

Where Δ = first deference operator and Vt = ΔUt = (Ut ~ Ut-1)

Either equation (3) (if there is no long run relationship among the variables) or equation (10) (in the event of a long run relationship among the variables) shall be estimated.

RESULT AND DISCUSSION

From figure 2 we can deduce that per capita GDP and rice imports have direct relationship around 1970s per capita GDP rises and falls which also reflected in rice imports in same manner. Also around 1980s when there was a greater fall in per capita GDP probably due to economic depression there was also fall in rice imports. But from 1986s onward rice import does not show a significant response to change in per capita GDP. This is as a result of ban placed on rice from 1986 which was later lifted in 1996. From the graph (in Figure 3) around 1960s and early 1970 when exchange rate was relatively low and constant, rice import was very low. However: around 1980s rice importation was very low as a result of economic depression while exchange rate movement was linear. Furthermore from 1990s onward the change in rice imports and exchange rate cannot be compared. Therefore, it can be inferred from figure 3 that rice import and exchange rate are not correlated which indicates that rice importation into Nigeria is not discouraged by deregulation of the exchange rate. In fact when there was increase in exchange rate around 2006 and 2009 there was increase in rice imports which should be other way round. Figure 4 gives an indication of rice import quantity and its price within 1961 to 2013.

There is direct relationship between rice import quantity and rice import price. They are both correlated. According to what is been shown in figure 4 as rice import price increases rice import quantity also increases which support the law of supply that the higher the price the higher the quantity supplied or produced vice versa.

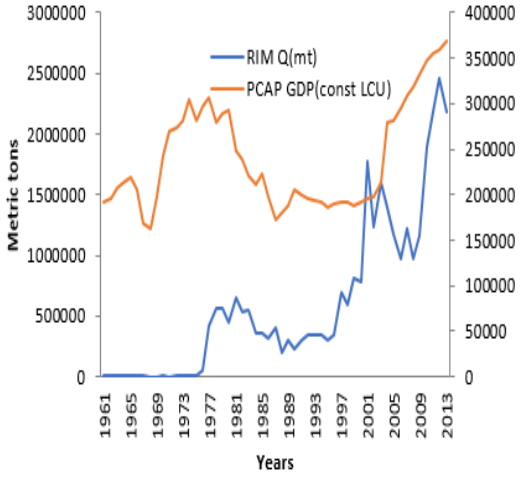

Fig 2: Trend in rice imports and per capita income in Nigeria between 1961 and 2013

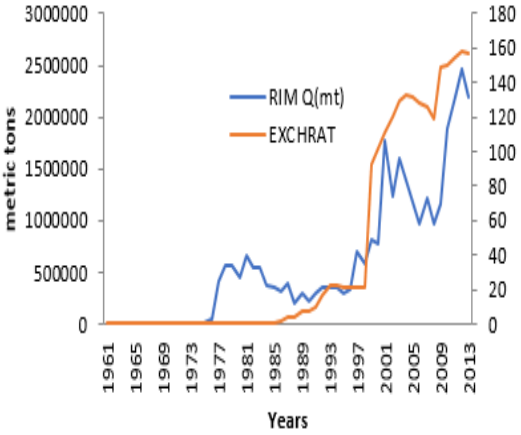

Fig 3: Trend in rice imports and exchange rate in Nigeria between 1961 and 2013

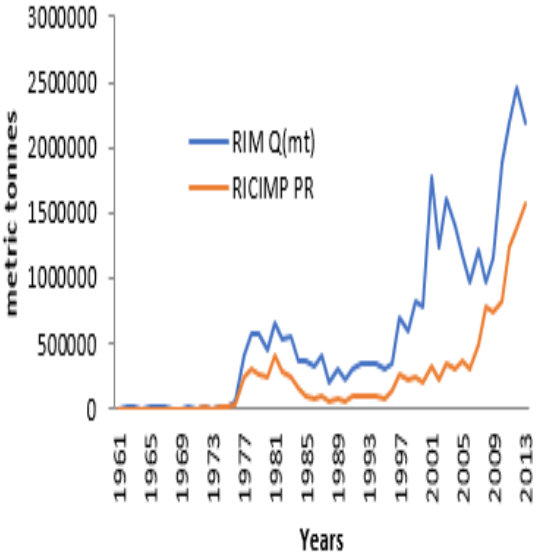

Fig 4: Trend in rice import quantity and rice import price in Nigeria between 1961 and 2013

Table 1 below indicates the order of integration of the variable in the model; this is in line with the primary requirement for interacting time series data. Unit root test shows that demographic development (DD) is integrated of order two I (2), domestic stock variation (DSV) is integrated of order zero I (0). All other variables were stationary at first difference. The result therefore affirms that the variables exhibit short run stability. Consequently, another diagnostic test was conducted to examine if there exist a long run relationship among the variables. This is shown in Table 2 for Johansen Cointegration Test. The result indicates that there exists a long run relationship among the variables. This is indicated by comparing the values of Trace statistics/Max. Eugen values with the critical values. The table reveals that there are at most four cointegrating equations. With this results, the variables were then interacted to determine the effects of each of the explanatory variables on the response variable. Table 3 indicates the result of error correction model (ECM). As expected, coefficient of error correction term ECT (-1) has negative sign and is statistically significant at 5% level.

Table 1: Unit Root Statistics of the series

Variables	ADF Test Results		PP Test Results		DF-GLS Test		Conclusion
	Level	1st Diff.	Level	1st Diff.	Level	1st Diff.	
RIMQ	-3.50	-3.50	-3.50	-3.50	-3.19	-3.19	I (1)
Calculated Values	-1.66	-4.44	-1.97	-9.81	-1.73	-4.52	
RIMP	-3.51	-3.50	-3.50	-3.50	-3.19	-3.19	I(1)
Calculated Values	-2.85	-3.71	-1.84	-8.49	-2.03	-3.76	
LRQ	-3.50	-3.50	-3.50	-3.50	-3.18	-3.19	I(1)
Calculated Values	-2.60	-9.69	-2.48	-10.54	-2.41	-7.11	
LRP	-3.50	-3.50	-3.50	-3.50	-3.18	-3.19	I(1)
Calculated Values	-2.71	-9.96	-2.57	-10.95	-2.47	-7.09	
RC	-3.50	-3.50	-3.50	-2.92	-3.18	-3.19	I(1)
Calculated Values	-2.46	-8.89	-9.28	-9.09	-2.09	-6.07	
PCI	-3.50	-3.50	-3.50	-3.50	-3.18	-3.19	I(1)
Calculated Values	-0.90	-5.12	-1.22	-5.07	-1.09	-5.20	
EXC	-3.50	-3.50	-3.50	-3.50	-3.18	-3.19	I(1)
Calculated Values	-1.34	-6.87	-1.35	-6.87	-1.05	-6.96	
MAP	-3.50	-3.50	-3.50	-3.50	-3.18	-3.19	I(1)
Calculated Values	-2.00	-7.46	-2.08	-7.46	-1.80	-7.47	
MEP	-3.50	-3.50	-3.50	-3.50	-3.18	-3.19	I(1)
Calculated Values	-1.94	-9.61	-1.94	-10.19	-2.05	-7.17	
DD	-3.50	-3.50	-3.50	-3.50	-3.19	-3.19	I(2)*
Calculated Values	-0.75	-2.11	0.55	-2.13	-1.53	-1.95	
DSV	-3.50	-3.50	-3.50	-3.50	-3.19	-3.19	I(0)
Calculated Values	-4.59	-11.73	-4.86	-12.90	-4.69	-12.00	

Source: Output from E-view Analysis

Table 2: Johansen Test for Cointegration

Null Hypothesis	Trace Statistics	Critical Value at 5%	Prob Values **	Max Eigen Values	Critical Values at 5%	Prob Values **
R=0	505.3879	334.9837	0.0000	94.93771	76.57843	0.0005
R≤ 1	410.4502	285.1425	0.0000	86.11368	70.53513	0.0010
R≤ 2	324.3365	239.2354	0.0000	77.80987	64.50472	0.0017
R≤ 3	246.5266	197.3709	0.0000	58.09530	58.43354	0.0539
R≤ 4	188.4313	159.5297	0.0005	47.26211	52.36261	0.1517
R≤ 5	141.1692	125.6154	0.0040	40.61015	46.23142	0.1768
R≤ 6	100.5590	95.75366	0.0224	34.98464	40.07757	0.1678
R≤ 7	65.57441	69.81889	0.1040	26.68475	33.87687	0.2806
R≤ 8	38.88966	47.85613	0.2647	15.19421	27.58434	0.7327
R≤ 9	23.69545	29.79707	0.2136	12.47710	21.13162	0.5013
R≤ 10	11.21834	15.49471	0.1984	8.662722	14.26460	0.3153
R≤ 11	2.555621	3.841466	0.1099	2.555621	3.841466	0.1099

Source: Output from E Views analysis

This conformed to our observation under Johansen cointegration Test that there exist a long-run relationship between import demand and its independent variables. From the result rice consumption, price of meat, price of maize, local rice quantity, demography development and stock variance are statistically significant at 5%. This implies that all these variables have impact on rice import demand either negatively or positively. While rice import price, per capita GDP, price of local rice and exchange rate are not statistically significant at 5% which implies that these variables have little or no effect on rice import demand. The probability of the null hypothesis being true is about zero. The Durbin Watson (having approximately 2) of the model confirms that there is absence of auto-correlation or serial correlation. The goodness of fit of the error correction model is very plausible. This indicate that the explanatory variables actually explain about 83 percent of the behaviour of rice import demand in Nigeria. The magnitude of each of the coefficient is however really high except for the exchange rate suggesting a higher effect of the explanatory variables except exchange rate which has smaller effect on the rice import demand in Nigeria. The signs of the coefficient of rice import price, per capita GDP, rice consumption, demography development, price of meat and price of maize are found to be positive while the signs of the coefficient of local rice quantity, local rice price, exchange rate, and domestic stock variance are negative. The positive signs of the coefficient of independent variables indicate that a unit change in any component of these variables will result in a positive change in the level of rice import demand. It could be observed that the sign of per capita income, rice consumption, exchange rate, local rice quantity, local rice price, maize price, demography development, and domestic stock variation conform to apriori expectation with theoretical belief while rice import price and price of meat does not conform to it. Thus the positive impact of rice consumption and per capita income implies that the higher they are the more the rice imports demand and vice versa. Also the Price of meat significant positive impact on rice import demand reveals that though rice and meat are assumed to be complement, an increase in price of meat does not affect the demand of rice import and its consumption. While the positive impact of Price of maize on Rice import demand support the assumption that they are substitute which means that as price of maize increases there would be increase in rice import demand and vice versa. But positive impact of rice import price on rice import demand does not support the law of demand which states that the higher the price of a commodity the lower the quantity demanded vice versa due to change in factors like population, per capita income etc. Also the negative influence of Local rice quantity on rice Import demand indicates that rice import demand and Local rice quantity are not moving along the same direction which implies that if local rice production is developed the rice import demand will reduce and vice versa. This is contrary to Ogundele (2007) finding, that output of local rice will not bring down importation. On the other hand the negative effect of Local rice price on rice import demand indicates that changes in local rice price may not necessarily determine rice import demand in Nigeria which corroborated with Ogundele (2007) finding that import demand for rice was inelastic with respect to price of Local rice. The Exchange rate negative impact on rice import demand implies that percentage increase in exchange rate will reduce the rice import demand though at a lower rate since the coefficient is very low (-0.014). This supports Sunday *et al* (2015) study that, the long run import demand function of rice respond negatively to exchange rate. The significant positive influence of demography development on rice import demand shows that as the population increases a rice import demand increase which is as a result of inability of local rice production to meet the increasing rice demand. Also the significant negative impact of stock variance supports the general belief that increments in domestic stock, ceteris paribus, should lead to a significant decline in volume of rice imports. Lastly, the error correction model is the most consistent determinant of imports. The relative importance attached to the various import policies by the authorities is reflected by the speed of adjustment measured by the coefficient of error correction term. The lagged ECM coefficient is significant, validating the error correction model specification. However the speed of adjustment of -1.97 is relatively high

Table 3: Result of the Nigeria's Error Correction Import Demand Model (1961– 2013)

Variable	Coefficient	Std. Error	t-statistics	Prob.
C	-0.520891	0.251489	-2.071226	0.0493
DLRIMP(-1)	0.701106	0.400637	1.749979	0.0929
DLRIMP(-2)	0.691350	0.417442	1.656156	0.1107
DLRIMP(-3)	0.107276	0.164517	0.652068	0.5206
DLPCAPGDP(-2)	0.793206	1.167956	0.679140	0.5035
DLRCON(-1)	1.687910	0.825780	2.044020	0.0521
DLRCON(-2)	2.824729	1.013695	2.786568	0.0102
DLMEAT_PR2(-1)	1.993187	0.687203	2.900436	0.0079
DLMEATPR2(-2)	3.551745	0.826855	4.295486	0.0002
DLMEAT_PR2(-3)	4.752395	1.123109	4.231466	0.0003
DLMAPR2(-2)	0.489932	0.513072	0.954898	0.3491
DLMAPR2(-3)	1.246528	0.480651	2.593414	0.0159
DLLOCRQ(-1)	-2.809752	0.910631	-3.085500	0.0051
DLLOCRQ(-2)	26.44202	26.08464	1.013701	0.3208
DLLOCRQ(-3)	-20.93397	16.82244	-1.244408	0.2254
DLLOCRP2(-2)	-26.06868	25.65768	-1.016019	0.3198
DLNLOCRP2(-3)	21.95762	16.24526	1.351633	0.1891
DEXC(-3)	-0.014105	0.009148	-1.541748	0.1362
DD(-2)	9.931578	3.379828	2.938486	0.0072
DD(-3)	-9.703065	3.449642	-2.812775	0.0096
DSTOCKVAR	-1.05E-06	3.71E-07	-2.828447	0.0093
DSTOCKVAR	-6.48E-07	3.93E-07	-1.647941	0.1124
ECT(-1)	-1.976364	0.420380	-4.701371	0.0001

R^2 =0.830973 Adj. R^2 = 0.661945, Log likelihood = -16.77201, DW -Stat. =2.074557, F-statistic = 4.916202

Conclusion: From the results, increase in the level of demography development which leads to increase in rice consumption and a resultant increase in rice importation. Therefore, measures should be put in place to promote commercial farming (which would augment local rice production in large-scale and ensure efficient processing) such that the rice thus produced is affordable to consumers and guarantees a fair return to the producers. Also, policies and programmes with the ability and capacity to redirect and taste and preference of Nigerian's towards consumption of local rice should be adopted and carefully implemented, while rice import restriction policies be strengthened.

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