

Currency Devaluation and Importation of Rice in Nigeria

Abstract

Preference for consumption of imported rice by many Nigerians in the face of unstable exchange rate and currency devaluation, informed the determination of the time trend, long run and causal relationship that exists between naira exchange rate and rice importation in Nigeria. Using time series data between 1980 and 2015, the study employed growth rate function and Co-integration Techniques as analytical tools. The results showed a positive trend in the growth rate analysis, which implies that time, is a major determining factor between the exchange rate value of naira and rice importation during the period under review. It also revealed that naira exchange rate and rice importation (RI) were non stationary at level $I[0]$, that is, not integrated at order zero but were stationary at first difference i.e. integrating at order one($I[1]$), and also significant at 1% level of probability. The Johansen test confirmed a long-run relationship between naira exchange rate and rice importation; while the causality test revealed that naira exchange rate and rice importation in the country did not granger cause. The study therefore concluded that naira devaluation with fluctuating exchange rate vis-à-vis other currencies significantly determined rice importation during the period under review, which means that whenever there is change in the exchange rate of naira, it will significantly affect the volume as well as value of rice imported into the country.

Keywords: Growth Rate Function; Co-integration Techniques; Naira devaluation; Rice importation; and Nigeria

Introduction

Agriculture was the backbone of the Nigeria's economy at independence in 1960 and provided employment to over 75% of the population. The sector provides over 70% of total food consumed in the country, all raw materials for its agro-based industry and responsible for export earnings to finance imports (Alamu, 1981). However, Abdullahi (1981) observed that 21 years after independence, Nigeria's agriculture was neither capable of producing enough food for the country's fast growing population nor able to cope with the growing demands for agricultural raw materials to sustain the country's agro-based industries. Several reasons were also put forward by various authors to explain the progressive decline in the performance of the Nigerian agricultural sector. Ashaka (2008); Walkenhorst (2007) and Sekumade (2009). The key reason pointed out by these authors was the oil boom, which is responsible for total neglect of agricultural sector by the government coupled with the exponential increase in foreign exchange earnings realized from the export of crude oil between 1972 and 1980. The monetization of oil earnings exerted an upward pressure in price level coupled with a rapid growth in money supply in Nigeria.. When the price of crude oil slumped during the 1st half of 1980's, Nigeria's crude

oil, was sold at slightly above US\$41 per barrel in the early 1981, and fell to less than US\$9 by August, 1986 (Sekumade, 2009). This, according to Sekumade triggered off a series of development in the economy; and one example of such developments is the state of fiscal crisis as reflected in the persistent budget deficit, which culminated to approximately ₦17.4 billion between 1980 and 1984. Monetary policy also became highly expansionary as a large part of the deficit incurred during this period were financed through the creation of credit thus the local domestic credit to the economy recorded an average annual growth rate of 29.9% between 1980 and 1984, with most of the increase attributable to net claim by the government (Afolabi, 1995). Devaluation according to Campbell (2010), is expressed in Nigeria context as the unit of naira needed to purchase one unit of another country's currency e.g. the United States dollar, British pounds, Euro among others. He also stated that devaluation of home currency affects local enterprises in their payment of foreign transactions, which could lead to the reduction in the value of a currency with respect to those goods, services or other monetary unit with which the home currency can be exchanged.

Devaluation of currency was introduced by Nigeria government in 1986, with the institution of Structural Adjustment Programme (SAP) as a policy designed to achieve a realistic exchange rate for the naira that was over-valued. This was unhealthy for economic growth and development of the nation since overvalued currency further worsen balance of payment problem (Todaro, 1989). However, the depreciation of Naira in 1986 during the structural adjustment Programme led to fall in Nigeria exchange rate with other foreign countries, thereby affecting most of the staple foods in the country. The SAP era thus represented the anti-climax of the thriving, flourishing period for Small and Medium Enterprises (SMEs) in Nigeria including the rice importers. Rice which is one of the staple foods in Nigeria is on the high side as a result of the increasing population growth, increased income levels, rapid urbanization and associated changes in family occupational structures. (Akande, 2011). Therefore the volume of rice imported in 2003 was 2.5 million metric tons at the price of ₦29.85 billion while in 2004 volume imported was 0.84 million metric tons at the price of ₦30.31 billion, which was attributed to the high tariff wall of 150% (Daramola, 2005). Naira purchasing power plays an important role in economic growth and development; and high dependency on goods and services from foreign countries bring negative impact than positive to the Nigeria economy. Meanwhile, consumption of foreign

rice with high rate of its importation has been a source of worry to Nigeria populace, especially in the face of unstable foreign exchange rate and currency devaluation in the country; hence this study seeks to examine the relationship between Naira exchange rate and Rice Importation (RI), estimate the value trend and growth rate of RI over the years, as well as determine the long run and causal relationship between naira exchange rate and rice importation in the study area.

2. Literature Review

Acar (2000) conceptualized currency devaluation as a macro-economic policy that deals with deliberate reduction in the value of domestic currency with the aim of maximizing gain in tradable items, and also affects goods and services in a nation where currency is devalued compared to another. The reduction in prices of goods and services according to Acar will stimulate trading activities in a country with devalued currency, and with overall purpose of enhancing economic growth and development

Voir (1997) analyzed the impact of devaluation on small scale enterprises in Burkina Faso, using ordinary least square (OLS) multiple regression method. He also considered the effect of currency devaluation on cost of production and profitability of small scale enterprises; and found that the rate of turnover in business activities reduced by 22%; while prices of imported inputs increased. It also revealed that a substantial profit was recorded in areas of building constructions; while other small scale businesses such as restaurant, provincial retailing, blacksmiths, carpentry and auto-mechanics among others suffered the scourge of devaluation. The study however concluded that devaluation has weakened many small enterprises which are not producing export products because of the depression of urban markets, arising from the fall of the purchasing power of the households. Egedegbe (2009) also argues from the proposition of neo-classical growth model that devaluation of the Naira has impacted negatively on all Nigerians, most especially companies and individuals that are poor. He further confirmed that devaluation made most companies to operate at a loss due to high cost of imported inputs, which contributed to increase in the major part of their net profits; while on the part of the masses the price of consumable items including rice, which is a staple food in Nigeria increased astronomically; and which consequently has negative effect on the poor.

Abayomi (2007) assessed the impact of naira devaluation on Nigeria economy, using the Autoregressive Distributed Lag (ARDL) and Granger causality test. He discovered that devaluation can only make goods and service expensive in a dependent economy like Nigeria; and in

addition to the falling naira exchange rate which is the crippling effect of inflation in Nigeria (see also Adebayo, 2009). Abayomi also concluded that naira devaluation has enabled rich people in Nigeria to purchase imported rice, which became out of reach for the poor due to its high price. Kost (1976) also used theoretical exploration to review the trade impact of currency devaluation on any commodity or sub-sector of a country's economy. He traces the effects of changes in exchange rates on commodity production, consumption, trade levels, and price for any two trading partners and discovered negative effect on the exporting country's currency; while the importer's currency remain appreciated. Galbotswe and Andria's (2011), examined the effect of devaluation on monetary and fiscal policy, using the error correction model. The study discovered a contractionary effect of devaluation in the long run, while expansionary effect of devaluation on monetary and fiscal policy was also discovered in the short run. The summary of the reviewed studies pointed to the negative effect of currency devaluation on micro and macroeconomic units, as well as the overall performance of the economy. In Nigeria studies also agree that negative effect of naira devaluation was significantly felt by the poor masses due to the importation of rice and other consumable items (Abayomi, 2007; Adebayo, 2009). The current reality in the Nigeria economy where there is more preference for importation of consumable items including rice, despite the low performance of naira against other major currencies in the foreign exchange market; justifies the need for the study.

3. Methodology

3.1 Model Specification

Based on the objective of the study to examine the time trend of rice importation in Nigeria spanning from 1980 to 2015; the study expressed a growth rate functional Model as follows:

$$Y = b_0 e^{bt} \dots \dots \dots (1)$$

After linearizing Y in logarithm, equation (1) becomes:

$$\text{Log } Y = b_0 + b_1 t \dots \dots \dots (2)$$

Where:

Y = Value of rice importation (metric tons)

t = Time trend

b_0, b_1 = estimated coefficients

The growth rate (r) is given as:

$$r = (e^{b_1} - 1) * 100$$

Where 'e' is Euler's exponential constant (2.7183)

3.2 Data Analytical Techniques and source

This study used descriptive statistics to determine the trend of naira devaluation and rice importation within the period 1980 – 2015; growth rate function analysis to examine the time trend; while the Co-integration Techniques was also used to determine the long run relationship between naira devaluation and rice importation within the period under consideration. The presence of Co- integration among the variables was conducted based on the F-statistic of the joint significance of the coefficients at specified time period; while the null hypothesis of no Co-integration between naira devaluation and rice importation was given as $H_0: \gamma_1 = \gamma_2 = 0$

(No co-integration); while the alternative hypothesis was also given as $H_a: \gamma_1 \neq \gamma_2 \neq 0$ (Presence of co- integration)

The study employed time series data spanning from the period 1980 – 2015 in Nigeria. Data were mainly secondary and sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin and annual Reports and statement of Accounts, showing the volume of rice importation and devaluation of naira in Nigeria between 1980 and 2015.

4. Results and Discussion

4.1 Statistical Analysis of Naira/USD Exchange Rate and Rice Importation

The statistical properties of the variables were revealed in Table 1. The minimum and maximum values of **Naira/USD Exchange rate** were 0.546 and 196.99 respectively while that of rice importation showed 55,000.00 and 350,000.00 metric tons respectively. This shows that the average **naira exchange with US dollar and rice importation** were 70.09 and 516,210.50 respectively. It was observed that the data for naira exchange rate were normally distributed given the values of standard deviation and Jarque-Bera to be 67.21 and 4.32 respectively. This means that the variants were not far from the mean. That is, they revolved around the average value of 70.09. Again, on rice importation, the result showed that the data were not normally distributed given the value of standard deviation and Jarque-Bera to be 762,042.70 and 115.98

respectively. This implies that the variants were widely spread or varied from the mean. This was also confirmed by the significant level (1%) of the Jarque-Bera estimate.

Table 1: Summary Statistics of Naira/USD Exchange Rate and Rice Importation

Estimate	Exchange Rate Value (N/US \$ 1.00)	Rice Importation (metric tons)
Mean	70.09343	516210.5
Median	21.96860	241500.0
Maximum	196.9900	3500000.
Minimum	0.546400	55000.00
Std. Dev.	67.20811	762042.7
Skewness	0.293450	2.695900
Kurtosis	1.406629	9.946348
Jarque-Bera	4.324927	115.9849
Probability	0.115041	0.000000
Observations	36	36

Source: Computed from CBN database

Again, the graphical representation of rice importation value was examined in figure 1. It was observed that there was a slight decrease from 1981 to 1985 in the value of rice importation. This was maintained in a steady form between 1986 and 1995. The value increased slightly from 1997 with a waved movement till 2006. Furthermore, it experienced a slight and steady increase from 2007 up to 2012. Surprisingly, there was skyrocket increase in the value between 2012 and 2013 but fairly dropped in 2014 through to 2015. It was observed that the volume of rice imported into the country was significantly encouraged from 2013 upward as a result of long and sharp

increase in its value. These trends were as a result of various policies on rice importation introduced into the country. Decrease in the volume of rice importation from 1981 – 1985 was as a result of pre-ban on import of rice which was aimed at developing rice production in the country. During this period, more stringent policies such as Input Supply and Distribution Policy, Agricultural Input Subsidy Policy, Water Resources and Irrigation Policy, Agricultural Cooperatives Policy as well as the structural Adjustment Programme were put in place.

The steady increase from 1986 – 1995 was as a result of the ban placed on rice import which was reinforced by the introduction of Structural Adjustment Programme (SAP) in 1986. Under SAP, various trade policies (tariff, import restrictions, and outright ban on rice import at various times) were put in place

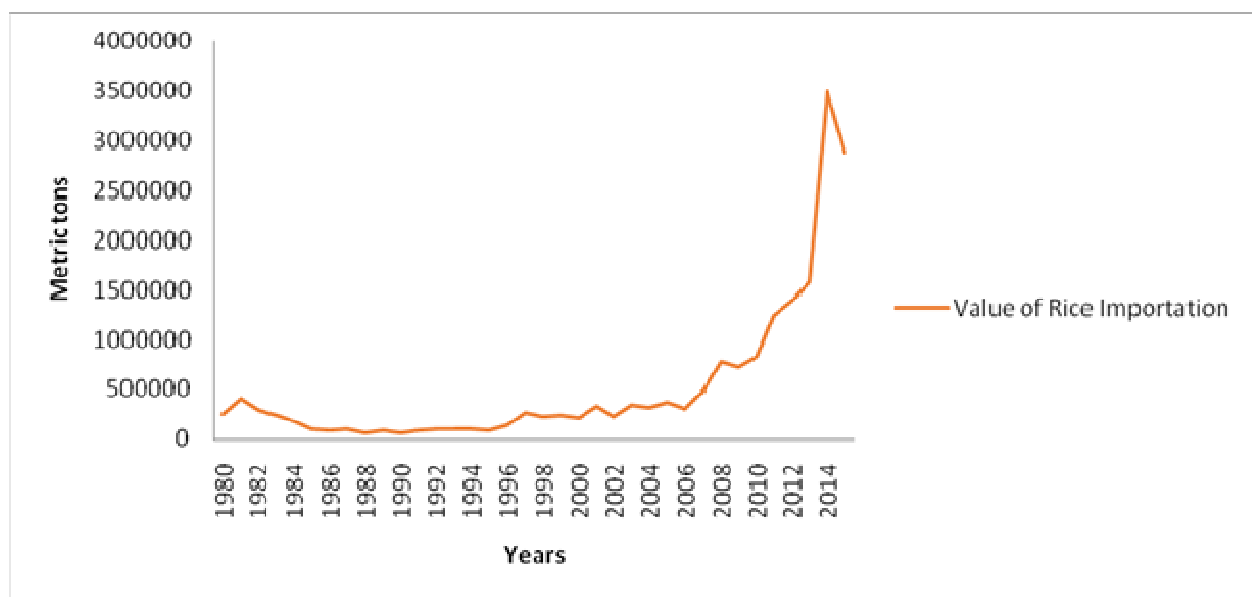


Figure 1: Rice Importation (RI) from 1980 to 2015

Source: Computed from CBN database

4.2 Time Trend and Growth Rate Function Analysis

The result of the time trend analysis of rice importation was presented in Table 2. The result showed that the variable exhibited positive trend in the period under consideration. The coefficient of time trend variable was positive and statistically significant at one percent level. This implies that time trend is a major factor in determining rice importation during the period under consideration. This means that a unit increase in time period will increase the volume of rice importation by 0.034 units respectively. It also revealed that the F-value for rice importation (46.43; $P < 0.01$) was statistically significant at 1% level for the period. This indicated that the explanatory variable has strong influence on the variable of rice importation in the model. The value of R^2 of 0.565 also revealed the goodness of fits for the model as the variation in the dependent variable was accounted for by the independent variable in rice importation by 56.5%. Table 2 also presented the growth rate for rice importation during the period under review. A positive growth rate of 3.46% was recorded in rice importation. This implies that there is increasing trend in the growth rate of the variable during the specified period of the study.

Table 2: Time Trend and Growth Rate Estimates for the variables

Dependent variable	b_0	b_1	R^2	Adj. R^2	F-value	Growth rate (%)
Rice importation	4.798 (0.106)	0.034*** (0.005)	0.577	0.565	46.429***	3.46

Source: Computed from CBN database

4.3 Co-integration Analysis

4.3.1 Unit Root Test

The Augmented Dickey-Fuller (ADF) unit root test was employed to know the order of integration of naira devaluation and rice importation. Based on the ADF test statistic in Table 3, it was revealed that the two variables were non stationary at level [I (0)] that is, not integrated at order zero. However, the two variables were stationary at first difference, which implies integrating in the order one [I (1)], and significant at 1% level. The test was necessary in order to show that the time series properties of the variables used in the study were void of spurious regression problem. This also confirms non acceptability of false relationship in regression estimates.

Table 3: Results of Augmented Dickey-Fuller (ADF) Unit Root Test

Variable	ADF Statistic	Lag	Remark
Level I[0]			
Naira Exchange Rate	-0.507773	0	Non stationary
Rice Importation	-1.0756184	1	Non stationary
First Difference I[1]			
Naira Exchange Rate	-5.237367	0	Stationary
Rice Importation	-6.772484	0	Stationary

Note: Test critical values are: 1% level = -3.639407; 5% level = -2.951125; 10% level = -2.614300

Lag selection is automatic based on Schwartz Bayesian criterion (SBC).

Source: Computed from CBN database

4.3.2 Co- integration Test

Having known the stationarity properties of the variables, Johansen test of co- integration was carried out to test the long run relationship between naira exchange rate and rice importation spanning from 1980 to 2015. This is revealed in Tables 4 and 5, the Trace and Max-Eigen co- integration results respectively. Both tests indicated the presence of co-integrating relationship between naira exchange rate and rice importation. The result also showed that there is one co- integrating equation at 1% level of probability, which implies that there is a long run relationship

225 between naira exchange rate and rice importation. The equation showed that naira exchange rate
 226 positively and significantly affected rice importation in the long run by 0.5%.

Table 4: Unrestricted Co-integration Rank Test (Trace)

Hypothesized	Trace		0.05	
No. of CE(s)	Eigen value	Statistic	Critical Value	Prob.**
None *	0.464268	21.53603	15.49471	0.0054
At most 1	0.009248	0.315880	3.841466	0.5741

Trace test indicates 1 co- integrating eqn(s) at the 0.05 level

***MacKinnon-Haug-Michelis (1999) p-values*

Table 5: Unrestricted Co-integration Rank Test (Maximum Eigenvalue)

Hypothesized	Max-Eigen		0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.464268	21.22015	14.26460	0.0034
At most 1	0.009248	0.315880	3.841466	0.5741

Max-eigen value test indicates 1 co-integrating eqn(s) at the 0.05 level

***MacKinnon-Haug-Michelis (1999) p-values*

227 Long run – Equation

228 $ND = 0.005142^{***}$ (RI)

229 (0.00103)

230 4.99

231 Granger Causality Test

232 The result of the granger causality test shown in Table 6 indicated that rice importation does not
233 affect the exchange rate of naira; while the exchange rate of naira also not granger cause rice
234 importation in the studied period. This means that whenever there is a change in the rate of
235 exchanging naira with other currencies the value of rice importation in the country will also be
236 affected.

237 ***Table 6: Results of Granger Causality Test***

Null Hypothesis:	Obs	F-Statistic	Prob.
Rice Importation does not Granger Cause Naira			
exchange rate	27	0.70308	0.6956
Naira exchange rate does not Granger Cause Rice importation		7.20609	0.0053

238

239

240 **5. Conclusion and Recommendation**

241 The study revealed that Rice Importation in Nigeria exhibited positive trend in the growth rate
242 during the period under consideration, this implies that time is a major determining factor
243 between naira exchange rate and rice importation. Also, Naira devaluation with the fluctuating
244 experience of naira exchange rate significantly determined rice importation during the period,

which means that whenever there is change in the rate of exchange of naira vis-à-vis other currencies, the volume and value of rice imported into the country will be affected. Hence, government need to focus more on indigenous technology; protect small and medium scale entrepreneurs towards mass production of local rice, to compete favourably with the more preferred foreign rice by many Nigerians. This reduces the volume of rice importation vis-à-vis its value; while the enormous foreign exchange used for the importation of rice into the country could be retained locally to stimulate the economy and bring up the value of the Naira.

References

- Abayomi, F. (2007). "On the Revaluation of the Naira" Cached <http://www.nigeriavillagesquare>
- Abdullahi, A. (1981). The Problems and Prospects of the Green Revolution for Agricultural and Rural Development of Nigeria: Technical and Environmental Perspectives, 1-50
- Adebayo, O. (2009). "Impact of IMF- World Bank Programmes on Nigeria" Cached <http://www.africa.accanalysis>
- Acar, M. (2000): Devaluation in Developing Countries: Expansionary or Contractionary? *Journal of Economics and Social Research*, 2(1). 59 – 83.
- Afolabi, M.O. (1995). Growth Effect of Small and Medium Enterprises (SMEs) Financing in Nigeria. *Journal of African Macroeconomic Review*, 3(1), 193-205.
- Akande, P. T. (2011). An Overview of Rice Economic. *The Nigeria Institute of social and Economic Research* (NISER), 1-11,2011.
- Alamu, J. C. (1981).The effect of exchange rate fluctuations on the Nigerian. *African Journal of Business Management* Vol. 4, 1-5.
- Ashaka, K. (2008). "Nigeria and Global Food Crisis". The Sun Newspaper (May 5th, 2009). Retrieved on 4th August, 2009 from www.sunnewsonline.com
- Campbell, M. (2010).Controversy in Applied Economics. *London: BPCC Wheaton's Ltd; Exeter*. 2010.

276 Daramola, B (2005). Government Policy and Competitiveness of Nigeria Rice Economy paper
 277 presented at the workshop on Rice Policy for Food Security in Sub-Saharan Africa
 278 organized by WARDA, Cotonou, Republic of Benin 07-09- 2005.
 279

280 Egedegbe, M.(2009).“The Pains of the Devalued Naira” Caught
 281 <http://www.stockstockmarketniger>

282 Galbotswe, O. and Andria’s, T. (2011): Are devaluation contractionary in small import
 283 dependent economy? Evidence from Botswana

284 Kost, W.E.(1976).“Effects of an Exchange Rate Change on Agricultural Trade.”*Agricultural*
 285 *Economics Research* 28:99-106.

286 Vior, A. (1997). “The Impact of Devaluation on Small Enterprises in Burkina Faso” Caught
 287 <http://www.entrepreneurial.anf.org.com>

288 Todaro, M. P. (1989). Economics For A Developing World: An introduction to principles,
 289 problems and policies for development. Pp516.
 290