

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 and long run relationship that exists between naira devaluation 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 in the relationship between devaluation of naira and rice importation during the period under review. It also revealed that naira devaluation (ND) 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 also confirmed a long-run relationship between naira devaluation and rice importation. The study therefore conclude that naira devaluation significantly determined rice importation during the period under review ,which means that whenever there is change in the value 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 Nigerian economy at Independence in 1960 and provided employment to over 75% of the population. Over 70% of total food consumed in the country in terms of raw materials for its agro-based industry as well as 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 keep the country's agro-based industries running as well Small and Medium scale enterprises"(SMEs). Several reasons were also put forward by various authors (such as Ashaka, 2008; Walkenhorst, 2007; Sekumade, 2009) to explain the progressive decline in the performance of the Nigerian agricultural sector. But one key reason explained by these authors was the oil boom, which 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 rapid growth in money supply in Nigeria arising from the monetization of oil earnings exerted an upward pressure in general price level. 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 affect 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 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). 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 effect of currency devaluation on rice importation in Nigeria between 1980 and 2015; and specifically determines the trend, time trend and long run relationship between naira devaluation and rice importations into the country.

2. Literature Review

Acar (2000) conceptualized currency devaluation as a macro-economic fiscal policy that deals with deliberate reduction in the value of domestic currency with the aim of maximizing gain in tradable items, and also make Goods and services cheaper 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 lost 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 Auto-Regressive 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 placed rich people in Nigeria at advantage position over the poor on importation of 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 between Naira Devaluation and Rice Importation in Nigeria between 1980 and 2015; the study expressed a growth rate functional Model as follows:

$$Y = b_0 e^{b_1 t} \dots\dots\dots (1)$$

Linearizing Y in logarithm

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

Where:

Y= output

T= Time trend Variable (1980-2015)

b_0, b_1 = Regression parameter to be estimated

131 $R = (e^b - 1) * 100$

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

133 $b_0 = \ln Y_0$

134 $b_1 = \ln(I + r)$

135 Equation (2) is rewritten as:

136 $\ln Y_t = b_0 + b_1 t \dots \dots \dots (3)$

137 Adding disturbance term to equation (3), the explicit form of the model employed was derived
138 as:

139 $\ln Y_t = b_0 + b_1 t + U_i \dots \dots \dots (4)$

140 Where:

141 Y_t = Output of rice ('000 tonnes)

142 b_0 = constant term

143 b_1 = coefficient of time variable

144 U_i = Random term

145

146 ***3.2 Data Analytical Techniques and source***

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

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

160 **4. Results and Discussion**

161 ***4.1 Statistical Analysis of Naira Devaluation and Rice Importation***

The statistical properties of the variables were revealed in Table 1. The minimum and maximum values of naira devaluation were 0.546 and 196.99 respectively while that of rice importation showed 55,000.00 and 350,000.00 respectively. This shows that the average naira devaluation and rice importation were 70.09 and 516,210.50 respectively. It was observed that the data for naira devaluation 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, in 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 Devaluation and Rice Importation

Estimate	Naira Devaluation	Rice Importation
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

174 *Source: Computed from field survey, 2016*

175 Similarly, the behaviour of the two variables (i.e. Naira Devaluation and Rice Importation) from
 176 1980 to 2015 was also graphically represented (see Figure 1 and 2). In figure 1, it was observed
 177 that the value of naira devaluation was very low from 1980 to 1985 but there was a slight rise in
 178 the value starting from 1986 and continued until 1991, where it made a slight rise again. There
 179 was also a sharp increase in 1997 and further formed a parabola shape till 2007, but shoots up
 180 again from 2008 and moved in an undulating form. It was moving up in a steeply and shape form
 181 as it was approaching 2015. Also, in figure 2 there was a slight decrease from 1981 to 1985 in
 182 the volume of rice importation. This was maintained in a steady form between 1986 and 1995.
 183 The volume increased slightly from 1997 with a waved movement till 2006. Furthermore, it
 184 experienced a slight and steady increase from 2007 up to 2012. Surprisingly, there was skyrocket
 185 increase in the volume between 2012 and 2013 but fairly dropped in 2014 through to 2015. It
 186 was observed that the volume of rice imported into the country was significantly encouraged
 187 from 2013 upward as a result of long and sharp increase in its value.

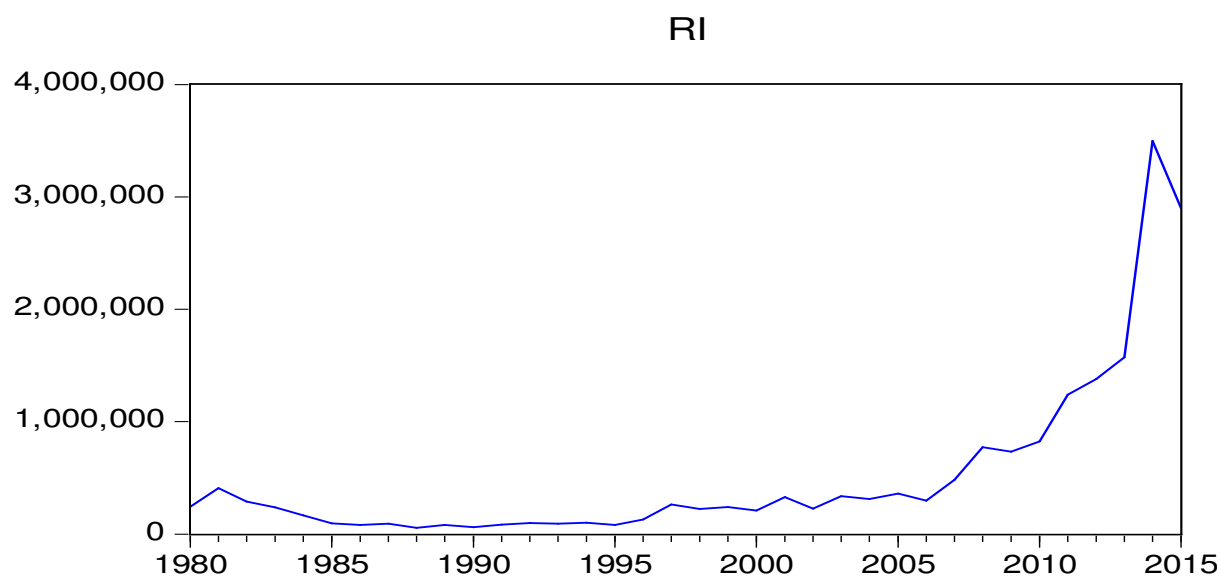
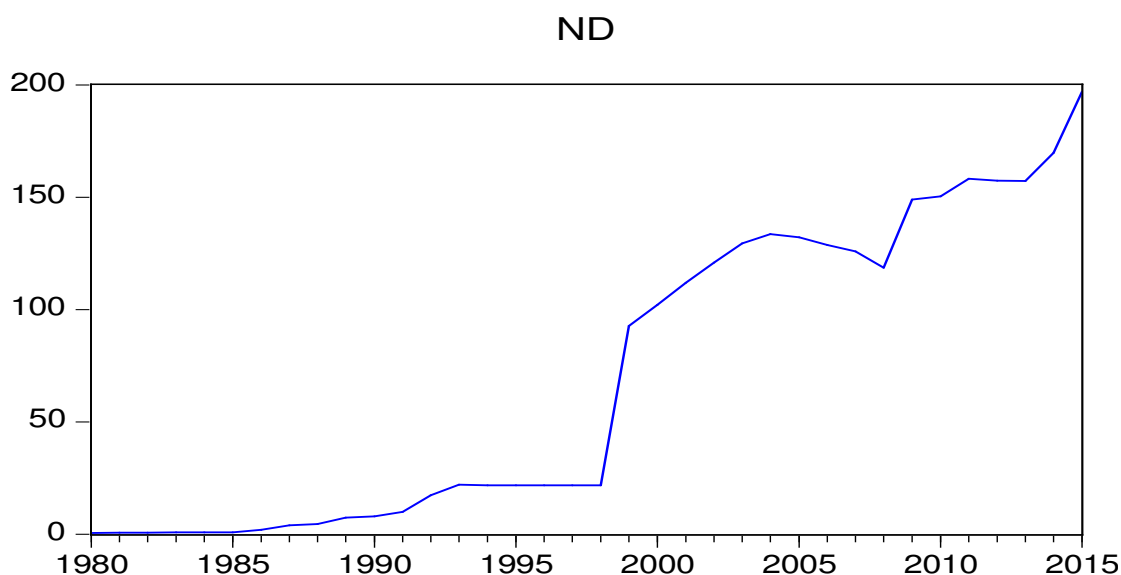


Figure 1: Naira Devaluation (ND) from 1980 to 2015

Figure 2: Rice Importation (RI) from 1980 to 2015

Source: Computed from field survey, 2016

4.2 Time Trend and Growth Rate Function Analysis

The results of the time trend analysis of naira devaluation and rice importation were presented in Table 2. The results showed that the two variables exhibited positive trend in the period under

consideration. The coefficients of time trend variables were positive and statistically significant at one percent level. This implies that time trend is a major factor in determining both the naira devaluation and rice importation during the period under consideration. This means that a unit increase in time period will increase the values of naira devaluation and volume of rice importation by 0.079 and 0.034 units respectively. It also revealed that the F-values for naira devaluation (291.20; $P < 0.01$) and rice importation (46.43; $P < 0.01$) were statistically significant at 1% level for the period. This indicated that the explanatory variable has strong influence on both the variable of naira devaluation and rice importation in the model. The values of R^2 of 0.892 and 0.565 also revealed the goodness of fits for the models as the variation in the dependent variable was accounted for by the independent variable in both naira devaluation and rice importation variables by 89.2% and 56.5% respectively. Table 2 also presented the growth rates for both naira devaluation and rice importation during the period under review. A positive growth rate of 8.22% and 3.46% was recorded in naira devaluation and rice importation respectively. This implies that there is increasing trend in the growth rate of both variables during the specified period of the study; while the estimated growth rate of naira devaluation was twice that of rice importation.

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 (%)
Naira devaluation	-0.098 (0.098)	0.079*** (0.005)	0.895	0.892	291.198***	8.22
Rice importation	4.798 (0.106)	0.034*** (0.005)	0.577	0.565	46.429***	3.46

Source: Computed from field survey, 2016

217 4.3 Co-integration Analysis

218 4.3.1 Unit Root Test

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

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

Variable	ADF Statistic	Lag	
Level I[0]			
Naira Devaluation	-0.507773	0	
Rice Importation	-1.0756184	1	
First Difference I[1]			
Naira Devaluation	-5.237367	0	
Rice Importation	-6.772484	0	

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

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

230 *Source: Computed from field survey, 2016*

231 4.3.2 Co- integration Test

232 Having known the stationarity properties of the variables, Johansen test of co- integration was
 233 carried out to test the long run relationship between naira devaluation and rice importation
 234 spanning from 1980 to 2015. This is revealed in Tables 4 and 5, the Trace and Max-Eigen co-
 235 integration results respectively. Both tests indicated the presence of co-integrating relationship

236 between naira devaluation and rice importation. The result also showed that there is one co-
 237 integrating equation at 1% level of probability ,which implies that there is a long run relationship
 238 between naira devaluation and rice importation. The equation showed that naira devaluation was
 239 positively and significantly affected by 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 Eigen value)

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 -integratingeqn(s) at the 0.05 level

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

Table 6: Unrestricted Co-integrating Coefficients (normalized by $b'S11b=I$):

Naira Devaluation	Rice Importation
0.000658	3.38E-06
0.023444	-3.12E-06

Unrestricted Adjustment Coefficients (alpha):

Different(Naira		
Devaluation)	0.527111	-1.257749
Different(Rice		
Importation)	236223.2	929.6332

1 Co-integrating Equation(s):	Log likelihood	-607.0586
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Normalized co-integrating coefficients (standard error in parentheses)

Naira Devaluation: Rice Importation

1.000000	0.005142
	(0.00103)

Adjustment coefficients (standard error in parentheses)

Different (Naira

Devaluation) 0.000347
(0.00157)

Different(Rice

Importation) 155.4123
(30.5020)

240 *Source:* *Computed* *from* *field* *survey,2016*

241

242 **5. Conclusion and Recommendation**

243 The study revealed that both the Naira Devaluation and Rice Importation in Nigeria exhibited
 244 positive trend in the growth rate analysis during the period under consideration, this implies that
 245 time is a major determining factor in the relationship between the two variables. Also, Naira
 246 devaluation significantly determined rice importation during the period, which means that
 247 whenever there is change in the value of naira, it will affect the volume of rice imported into the
 248 country. Hence, government need to focus on indigenous technology; protect small and medium
 249 scale entrepreneurs towards mass production of local rice, to compete favourably with the more
 250 preferred foreign rice by many Nigerians. This reduces the volume of rice importation vis-à-vis
 251 its value; while the enormous foreign exchange used for the importation of rice into the country
 252 could be retained locally to stimulate the economy and bring up the value of the Naira.

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