

Zero Tariff Policy and Households Consumption of Imported Rice in Southwest Nigeria

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Abstract

The changing consumption pattern of Nigerians occasioned by increasing urbanization has made rice a critical food consumed in urban Nigeria. Imported rice has gained prominence and government over the years has used trade policy measures to influence rice consumption. The most recent was the suspension of tariff on imported rice from April to October, 2008. This study examined the consumption pattern of households in Ibadan, South-west Nigeria over 2 periods; before and after April, 2008. Data were collected using structured questionnaires, administered to 102 randomly selected households. Data were analyzed using descriptive and regression techniques (AIDS model). This study showed rice as a major staple contributing largely to food security in Nigeria. However, the effect of tariff suspensions led to a reduction in price of rice after the tariff suspension, thus making it affordable to the majority of households. This tends to cushion the effect of the grain crisis witnessed before the suspension.

Key words AIDS model, elasticities, rice consumption, tariff suspension, trade policy.

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Introduction

Rice is cultivated in virtually all the agro-ecological zones of Nigeria, but on a relatively small scale. In 2000, out of about 25 million hectares of land cultivated for various food crops, only about 6.37% was cultivated with rice [1]. The area cultivated for rice still appears small. During this period, the average national yield was 1.47 tons per hectare, significant improvement in rice production in Nigeria occurred in 1980 when output increased to 1 million tons, while area cultivated and yield rose to 550 thousand hectares and 1.98 tons per hectare respectively. Throughout the 1980s, rice output and yield increased. But in the 1990s, while rice output increased, the yield of rice declined, suggesting extensive rice cultivation. Though rice contributes a significant proportion of the food requirements for the population, production capacity is far below the national requirements. The food crisis of 2008 in Nigeria was influenced by the food price changes in the market and an escalation in the price of imported fuel [2].

Rice trend shows that, world consumption of rice is increasing on average of 1 per cent per annum and productivity by 0.5%. The global crisis, therefore, might be the cumulative effect of the gaps recorded each year [3]. It is worthy to note that there is no international trade policy affecting the Nigerian domestic rice production. Nigeria is an importing

country and may be affected by international trade policies only to the extent that such policies affect countries from which Nigeria imports rice. But the structural adjustment program (SAP), tended to restore Nigeria's ability to produce rice, having created an environment that made local production somewhat profitable but not fully competitive with imports. In order to meet the increasing demand, Nigeria has had to resort to importation of milled rice to bridge the gap between domestic demand and supply. High levies and duties on rice, up to 109% and food crisis being witnessed across the globe led to the soaring market price of rice and other staples in the country [4]. In lieu of this, government resulted in removal of all levies and duties on imported rice between May and October, 2008 in order to cushion the effect of grain shortage and stabilize the market price of rice in the country. It is to this effect that the impact of the zero tariff policy of rice on households' demand for food before and after the tariff suspension was examined.

The choice of rice for this study is based on the fact that rice plays a leading role in food security of households in Nigeria. As the demand for rice in Nigeria has been soaring, factors affecting its consumption should be identified, expenditure shares on rice in relation to other items, analyzed and rice consumption with respect to socio-economic characteristics of households in a typical urban area,

studied. The problem of acute food shortage and the ever increasing population of the country make it necessary to undertake a study that has to do with the rice consumption pattern of households as affected by policies put in place by the government (tariff removal). As it were, there are serious constraints and new areas of research requirements that need to be tackled to sustain rice as a basic food staple in the future and ensure household food security for Sub-Saharan Africa. It is, therefore, necessary to undertake a study on how increased rice importation caused by tariff removal, affects its short and/or long term availability to the Nigerian populace, who are the consumers of this product.

Analytically, the Almost Ideal Demand System (AIDS) model has been applied in times past in analyzing demand and consumption studies. The AIDS model has been applied by Madan [5] in analyzing the demand for fish in Bangladesh and Oyekale [6] used this model for analyzing food demand in Nigeria. According to Oyekale [6], the AIDS model is easy to estimate, gives arbitrary first order estimation to any demand system and satisfies the axioms of choices. Many of these good attributes have contributed tremendously to the application of the model to demand equation estimation in many parts of the globe. So we used this model in our study. The main objective of this study is to determine household consumption of rice in Ibadan North Local Government area of Oyo State, Nigeria before and after tariff removal. The specific objectives are to: Analyze expenditure shares on rice in relation to other food items before and after tariff removal; determine the factors affecting the consumption of rice before and after the tariff removal and examine the elasticities of rice in relation to other produce before and after tariff removal.

Methods

Study areas

The study area was Ibadan North Local Government (INLG) area, the capital of Oyo state in Nigeria. The Oyo State is located between Latitude 14° E and Longitude 8° N. The local government was created on the 27th September, 1991. It has 8 wards, extending from Agodi Gate to areas such as the University of Ibadan, bordered by other local government areas such as the Ibadan North East, Ido, Ibadan North West and Akinyele local government areas.

The area can be described as a residential and industrial one with the majority of its occupants being

Yoruba people. The INLG area, is the popular food stuff market (Bodija market), one of the largest markets in the State, the University of Ibadan (UI), the University College Hospital (UCH) and many commercial banks. There are parts of the local government area which are densely populated- such area as Agbowo, Sango etc. There are also sparsely populated areas like New Bodija and Agodi GRA etc.

Sources of data and method of data collection

The data were from primary source with the aid of a well structured questionnaire administered on 130 households out of which 102 were properly and completely filled. Respondents were selected using stratified random sampling. The study area was divided into two strata based on the population densities of the area. Among the densely populated areas Sango, Mokola, University of Ibadan and Agbowo were randomly selected, while a random selection of Agodi GRA, Ikolaba, Total Garden and New Bodija among the sparsely populated areas was also carried out. Households were selected based on proportionate to the size of the areas. Data were, however, collected in two rounds; before April (before tariff removal), 2008 and after April, (after tariff removal) 2008 from the same households.

Analytical tool

The data collected were analyzed using descriptive analysis and the Almost Ideal Demand System Model (AIDS). The AIDS model of Deaton and Muellbauer [7] has enjoyed great popularity in applied demand analysis. The AIDS model shows the relationship between budget shares of various commodities and the logarithm of real total expenditure and that of relative prices in a linear manner. In the past, demand analysis was mainly done based on a system equation derived explicitly from consumer theory which Stone called the linear expenditure system (LES) in 1954. Notable models already derived are the Rotterdam model [8] before the AIDS model in 1980.

The AIDS model gives the share equation in an n-good system. It could be stated as:

$$w_i = \alpha_i + \sum_{j=1}^n \gamma_{ij} \ln p_j + \beta_i \ln [X / P]$$

Where w_i is the expenditure share associated with rice and its substitutes.

α_i is the constant coefficient in the i th share equation, γ_{ij} is the slope/estimated coefficient of prices associated with the j th good in the i th share equation β_i is the estimated expenditure coefficient

p_j is the price on the j th good.

P is the price index

X is the total expenditure on the analyzed food items and it was calculated as follows:

$$X = \sum_{i=1}^n p_i q_i$$

Where q_i is the quantity demanded for the food items analyzed. The food items considered are based on those that are mostly consumed in the study area. They are rice, beans, bread, yam and garri.

The independent variables are:

X_1 = Income (₦)

X_2 = Household size

X_3 = Secondary education dummy (1 formal education, 0 otherwise)

X_4 = Household Occupation (1 professionals, 0 otherwise)

X_5 = Price of Rice (kg)

X_6 = Price of Beans (kg)

X_7 = Price of Bread (kg)

X_8 = Price of Yam (kg)

X_9 = Price of Garri (kg)

X_{10} = Total expenditure on food items (₦)

P is the price index defined by following equation.

$$\ln P = \alpha_0 + \sum_{j=1}^n \ln P_j + 1/2 \sum_{i=1}^n \sum_{j=1}^n \gamma_{ij} \ln p_i \ln p_j$$

In the non-linear AIDS model, Deaton and Muellbauer (1980) also suggested a linear approximation of the nonlinear AIDS model by specifying a linear price index as follows:

$$\ln P = \sum_{i=1}^n w_i \ln p_i$$

The model that uses Stone's geometric price index is known as Linear Approximate AIDS (LA-AIDS) model. In practice, the LA-AIDS model is more frequently estimated than the nonlinear AIDS model. The resulting linear approximate version of AIDS is as follows:

$$w_i = \alpha_i + \sum \gamma_{ij} \ln P_j + \beta_i \ln (X/P) \pm \sum EV$$

Where

E is the coefficients of other independent variables.

V is the vector of other independent variables.

Other parameters have been identified earlier.

For theoretical consistency, there are 4 basic restrictions that are to be satisfied by any estimated demand system. The 'adding-up' condition is automatically satisfied by the AIDS model and is

capable of satisfying the 3 other conditions, although, it does not necessarily to do so.

From equation 1, conservation implies the following restrictions on the parameters in the nonlinear AIDS model:

$$\sum_{i=1}^n \alpha_i = 1, \sum_{i=1}^n \beta_i = 0, \sum_{i=1}^n \gamma_{ij} = 0$$

Homogeneity is satisfied if and only if, for all i

$$\sum_{i=1}^n \gamma_{ij} = 0$$

The symmetry is satisfied if $\gamma_{ij} = \gamma_{ji}$

According to Ahmed and Shams [9], the Marshallian elasticities (uncompensated) coefficients [10, 11] are computed from the estimated parameters of the linear approximate AIDS model in the fifth equation as follows:

Own price elasticity $\Sigma_{ii} = -1 + (\gamma_{ii}/w_i) - \beta_i$
 Cross Price elasticity $\Sigma_{ij} = (\gamma_{ij}/w_i) - \beta_i (w_j/w_i)$
 Elasticity of expenditure $1 + \beta_i/w_i$

Results and discussion

Socio-economic characteristics of respondent

The average age of household head is 45.24 years, depicting an active stage of life, with 74.51% dominating the 30-49 age category (Table 1). A total of 83.3% of households are headed by males, while 50% of the total household heads are professionals with 44.12% managing their own businesses. However, 87.26% of households possess tertiary education. The mean household income is ₦105,500.00, while the mean expenditure on food is ₦27,689.22 with a modal household size of less than six people. As shown in Table 2, mostly consumed food items (staples) in the study area are beans, yam, garri and rice, thus necessitating the consideration of these staple foods alongside rice. At period t (before April 2008) expenditure share (w_i) on rice was 38.54%, which reduced to 37.37% at period $t+1$ (after April 2008), suggesting a 0.97% decrease in its expenditure share with respect to its substitutes identified in this study. This about 1% reduction in expenditure share may be the result of reduced price of rice due to zero tariff charge on imported rice. Also, at period t expenditure share (w_i) on beans was 14.68% of the total expenditure, which reduced by 14% at period $t+1$, indicating a 0.68% decrease in its expenditure share with respect to rice and other food items identified in this study. Expenditure share (w_i)

on bread at period t was 20.43% of the total expenditure on rice and other food items, which reduced to 0.07% at period t+1, suggesting a 20.36% decrease in its expenditure share with respect to rice and other food items identified in this study. The expenditure share (w_{it}) on yam at period t was 17.83% of the total expenditure on rice and other identified food items, which increased to 18.10% at period t+1, suggesting a 0.27% increase in its expenditure share with respect to rice and other food items identified in this study. Also, expenditure share (w_{it}) on garri at period t was 8.51% of the total expenditure which increased to 12.26% at period t+1, implying a 3.75% increase in its expenditure share with respect to rice and other food items identified.

Table 1 Socio-economic characteristics of respondents in the study area.

Age (Years)	Frequency	Percentage (%)
<30	14	13.73
30 – 39	21	20.58
40 – 49	41	40.20
50 – 59	17	16.67
>60	9	8.82
Total	102	100
Mean = 45.24		
Sex		
Male	85	83.3
Female	17	16.7
Total	102	100
Occupation		
Professional	51	50
Own business	45	44.12
Farming	2	1.96
Others: unemployed	4	3.92
Total	102	100
Household size		
<6	73	71.57
6 – 8	17	16.67
9 -11	9	8.82
>11	3	2.94
Total	102	100
Educational Level		
Tertiary	89	87.26
Secondary	8	7.84
Non-formal	5	4.90
Total	102	100
Income Distribution (N)		
< 100,000	46	45.10
100,000 – 199,999	43	42.16
200,000 – 299,999	6	5.88
300,000 – 399,999	6	5.88
>400,000	1	0.98
Mean = 105,500		
Total	102	100
Food Expenditure (N)		
< 15,000	17	16.67
15,000 – 39,999	58	56.87
40,000 – 69,999	25	24.51
>70,000	2	1.96
Mean = 27,689.22		
Total	102	100

Table 3 Estimates of AIDS model for rice and its substitutes before April 2008.

Determinants of household demand for rice and other food items before zero tariff policy regime

The determinants of household consumption of rice and other identified food items, before zero tariff policy regime was examined in this sub-section (Table 3). Before tariff suspension, the F-ratio was 2.3 and was significant at the 5% level of significance. Two of the explanatory variables significantly influenced the demand for rice at 1% level. These variables include unit price of rice and unit price of yam. A Naira increase in the price of rice would result in a 0.309 increase in its budget share, implying a preference for rice in the study area. However, a Naira increase in the price of yam would reduce the budget share on rice by 1.2%. Two of the explanatory variables also significantly affect budget share allocated to beans at 1% level of probability. These variables are unit price of beans and bread. Budget share on beans was increased by 0.133 and decreased by 0.037 for every Naira increase in prices of beans and bread. This indicates that households would rather increase their budget share on beans rather than bread if the prices of both items increase. Also, the price of bread is the only variable affecting households’ expenditure share on bread at 1% level of significance. A Naira increase in the price of bread increased households’ budget share by 0.073. On the contrary, a unit increase in household size reduced the demand for bread by 0.048, implying that households with larger size reduce bread consumption as its price increases. The unit price of yam, rice and bread are the factors influencing budget share on yam at 1% level of significance. Budget share on yam was increased by 0.15 for every Naira increase in its price and decreased by 0.021 and 0.041 for every Naira increase in prices of rice and bread, respectively.

Table 2 Expenditure shares on rice and its substitutes before and after April 2008.

Items	w_{it}	w_{it+1}	$w_{it+1} - w_{it}$
Rice	0.3854	0.3757	- 0.0097
Beans	0.1468	0.1400	-0.0068
Bread	0.2043	0.0007	-0.2036
Yam	0.1783	0.1810	0.0027
Garri	0.0851	0.1226	0.0375

w_{it} = Expenditure share before suspension; w_{it+1} = Expenditure share after suspension

Three explanatory variables significantly influencing households’ budget share on garri are unit price of rice and bread at 1% level of probability and educational level of the household head at 5%. Increased price of garri and bread reduced households’ expenditure share on the two food items

Variables	Rice	Beans	Bread	Yam	Garri
Food Expenditure	-0.0052 (-0.85)	-0.0026 (-0.75)	0.0028 (0.48)	0.0032 (0.82)	0.0019 (0.84)
Household size	0.046 (1.64)	0.025 (-0.75)	-0.048 (-1.80)*	-0.0123 (-0.64)	-0.010 (-1.03)
Level of Education of Household Head	0.056 (0.71)	-0.053 (-1.17)	0.062 (0.81)	0.0021 (0.04)	-0.071 (-2.48)**
Occupation	-0.014 (-0.63)	0.016 (1.27)	-0.028 (-1.34)	0.018 (1.32)	0.10 (1.34)
Unit Price of Rice	0.31 (2.83)***	-0.047 (-0.76)	-0.076 (-0.72)	-0.215 (-3.07)***	0.035 (0.88)
Unit Price of Beans	-0.106 (-1.68)	0.133 (3.70)***	0.0078 (0.13)	-0.024 (-0.59)	0.035 (-0.72)
Unit Price of Bread	0.028 (1.61)	-0.037 (-3.67)***	0.073 (4.3)***	-0.041 (-3.59)***	-0.023 (-3.78)***
Unit Price of Yam	-0.012 (-2.76)***	0.014 (0.58)	-0.018 (-0.43)	0.015 (5.37)***	-0.023 (-1.47)
Unit Price of Garri	-0.025 (-0.85)	-0.0092 (-0.54)	-0.033 (-1.15)	-0.0065 (-0.34)	-0.023 (6.74)***
R ²	0.1590	0.2760	0.1825	0.3368	0.4067
F	0.0229	0.0000	0.0067	0.0000	0.0000
RMSE	0.0934	0.0535	0.0901	0.3368	0.4067
chi ²	19.28	30.09	22.77	54.80	69.93

*** = Significant at 1%, ** = Significant at 5%, * = Significant at 10%; Numbers in parenthesis represents standard error; RMSF = Rocky Mountain spotted fever.

Table 4 Estimates of AIDS model for rice and its substitutes after April 2008.

Variables	Rice	Beans	Bread	Yam	Garri
Food Expenditure	0.0024 (0.47)	-0.0049 (-1.48)	0.00074 (0.15)	0.00102 (0.30)	0.000687 (0.24)
Household size	0.026 (1.02)	0.0028 (0.17)	-0.0198 (-0.78)	-0.01444 (-0.85)	0.00543 (0.38)
Level of Education of Household Head	0.224 (3.19)***	-0.118 (-2.57)*	0.0571 (0.82)	0.0887 (-1.88)**	-0.0729 (-1.99)*
Occupation	-0.033 (-1.82)*	0.0333 (2.69)***	-0.0210 (-1.12)	0.0198 (1.57)	0.0154 (1.034)
Unit Price of Rice	0.019 (2.19)***	-0.116 (-1.83)*	-0.0595 (-0.61)	-0.2216 (3.37)***	-0.0653 (-1.19)
Unit Price of Beans	-0.095 (-1.63)	0.076 (2.03)**	0.135 (2.36)**	-0.144 (-3.72)***	0.0278 (0.86)
Unit Price of Bread	0.0203 (1.25)	-0.0345 (-3.26)***	0.0858 (5.31)***	-0.0436 (-4.00)***	-0.0279 (-3.09)***
Unit Price of Yam	-0.0695 (-1.82)*	0.0035 (0.14)	-0.08489 (-2.24)**	0.196 (7.63)***	-0.0441 (-2.07)**
Unit Price of Garri	0.0333 (0.90)	-0.0374 (-1.56)	-0.0384 (-1.04)	-0.0342 (-1.38)	0.0767 (3.69)***
R ²	0.1832	0.2772	0.2778	0.4986	0.2491
F	0.0094	0.0000	0.0000	0.0000	0.0000
RMSE	0.0833	0.0541	0.0827	0.0560	0.0469
chi ²	21.83	38.71	38.50	102.98	33.85

*** = Significant at 1%, ** = Significant at 5%, * = Significant at 10%; Numbers in parenthesis represents standard error; RMSF = Rocky Mountain spotted fever.

Determinants of household demand for rice and its substitutes after zero tariff policy regime

by 0.073 and 0.024, respectively, implying that households tend to reduce their expenditure on the two items as their price increases. Household heads with formal education also reduced their budget share on garri by 0.071 as its unit price increases.

The determinants of household consumption of rice and other identified food items after tariff suspension as depicted in Table 4 were examined in this subsection. The F probability and chi-square values of the identified food items revealed the significance of the model at 1% level of significance.

After the zero tariff regime on rice, determinants of households' budget share on rice are unit price of rice and educational level of household head at 1% level and unit price of yam and occupational status at 10% level, respectively. Budget share of rice increased by 0.019 and decreased by 0.069 for every Naira increase in prices of rice and yam, respectively, implying households' preference for rice at the expense of yam if the prices of both food items increase. Household heads with formal education increased their budget share on rice by 0.224, while those that are professionals reduced budget share on rice by 0.033. The factors influencing households' demand for beans are unit price of bread and occupational status of household head at 1% level of significance, the unit price of beans and educational level of household head at 5% and unit price of rice at 10%, respectively. The budget share allocated to beans increased by 7.6% and decreased by 11.6% and 3.45% for every Naira increase in prices of beans, rice and bread, respectively. Household heads that are professional increases budget share on beans by 3.3% for every Naira increase in the price of beans. On the other hand, household heads with formal education reduces expenditure share on beans by 11.8% as price of beans increases by a unit. The determinants of households' demand for bread are unit price of bread at 1% level of probability and unit prices of beans and bread at 5% level of probability. The households' budget share of bread increased by 8.6% and 13.5% for a unit increase in the price of bread and beans, respectively, while it decreased by 8.5% for every Naira increase in the price of yam. This tends to reveal the preference of households for bread and beans to yam in the study area.

Five explanatory variables significantly determine households' demand for yam. These are unit prices of rice, beans, yam and garri at 1% level of probability, while educational level of household heads was significant at 5% level of probability. A Naira increase in budget share of yam increased its budget share by 1.96%. On the contrary, households' budget share on yam was reduced by 22.2%, 14.4% and 4.4% as a result of a Naira increase in the prices of rice, beans and bread, respectively; implying households will prefer spending more on these food items at the expense of yam if their prices increase. Expenditure share of households head having formal education was also reduced by 8.8% with increase in the unit price of yam. The implication of this is that households with literate head tend to spend less on yam as its price increases.

Variables determining households' demand for garri include: the unit price of bread and the unit price of garri at 1% level of significance, the unit price of yam at 5% level of significance and level of education of households head at 10% level of significance. Increase in unit price of garri increased its households' budget share by 0.077. On the other hand, the increase in unit price of yam and bread decreased households' expenditure share on garri by 0.044 and 0.028, respectively. Thus, indicating that households will spend less on garri if prices of yam and bread increase. Literate household heads demand less of garri (-0.073) relative to the illiterate household head. Table 5 and Table 6 profile the Marshallian and Hicksian price elasticities as well as the income elasticity of identified food items in the study area. Own price elasticities of the food items under Marshallian revealed that all the food items identified with the exception of yam are relatively inelastic with values less than unity. This indicates that the percentage change in price would lead to less change in the demand for food items before tariff suspension. A similar trend was also observed under Hicksian with all the food items being relatively inelastic. However, the proportionate increase in the price of rice would result in less than proportionate increase in its quantity demanded before tariff suspension. Cross price elasticity estimates revealed that all identified food items could serve as a substitute for rice (having positive value) before the suspension. This might be due to increase in price of rice noticed before the suspension of tariff on rice importation, which necessitated the substitution of rice for other identified food items by households. However, beans complement other food items with the exception of bread. Likewise, bread complements other food items with the exception of beans. Yam can be substituted for bread before tariff suspension, while garri can act as a substitute for rice. However, under Hicksian elasticity estimate, all other identified food items can substitute rice; bread can also substitute beans and vice-versa. Households also used yam to substitute bread and garri to substitute rice before tariff suspension.

Expenditure elasticity estimates revealed that all the food items with the exception of beans are luxuries with values greater than unity before tariff suspension. This implies that income shock will adversely affect the households' purchasing power of the food items except beans before the suspension. Table 7 and 8 profile Marshallian and Hicksian price and expenditure elasticity estimates of the identified food items in the study area after tariff suspension.

Own price elasticity estimates revealed that all the food items except yam (under Marshallian estimates) were relatively price inelastic for both Marshallian and Hicksian with values less than unity. Cross price elasticity indicated that other food items can serve as substitutes for rice under Marshallian and Hicksian estimates after the suspension. Beans can substitute bread and vice-versa under Marshallian and Hicksian estimates. However, yam complements other food items except rice under both Marshallian and Hicksian elasticity estimates. Garri is the only food item that complements rice under both elasticity estimates.

Table 5 Price and expenditure elasticities of rice and other food items before April 2008 (Marshallian price elasticities).

Items	LNP rice	LNP beans	LNP bread	LNP yam	LNP garri
Rice	-0.193	0.91	0.073	0.863	0.950
Beans	-0.35	-0.320	0.39	-0.09	-0.57
Bread	-0.45	4.84	-0.376	-0.08	-0.48
Yam	-1.26	-6.95	1.43	-1.209	-0.54
Garri	0.49	-10.57	-0.761	-0.06	-0.405

LNP = Natural logarithm of price

Table 6 Price and expenditure elasticities of rice and other food items before April 2008 (Hicksian price elasticities).

Items	LNP rice	LNP beans	LNP bread	LNP yam	LNP garri	Expenditure elasticity
Rice	0.19	0.80	0.03	0.80	0.80	1.0064
Beans	-0.32	-0.09	0.27	-0.06	-0.32	0.9823
Bread	-0.38	4.68	-0.06	-0.06	-0.37	1.0137
Yam	-1.21	-6.55	1.13	-0.77	-0.27	1.0179
Garri	0.41	-10.19	-0.41	-0.06	-0.15	1.0223

LN = Natural logarithm of price

Table 7 Estimates and elasticities of demand for rice and its substitutes after April 2008 (Marshallian price elasticities).

Items	LNP Rice	LNP Beans	LNP bread	LNP yam	LNP garri
Rice	-0.952	0.37	0.31	0.23	0.31
Beans	-0.83	-0.23	0.94	-0.27	-0.97
Bread	-0.53	189.21	-0.527	-0.28	-0.73
Yam	1.22	-139.87	-1.51	-1.223	-0.96
Garri	-0.53	39.16	0.73	0.31	-0.5337

LN = Natural logarithm of price

Table 8 Estimates and elasticities of demand for rice and its substitutes after April 2008 (Hicksian price elasticities).

Items	LNP rice	LNP beans	LNP bread	LNP yam	LNP garri	Expenditure elasticity
Rice	-0.57	0.05	0.02	0.05	0.05	0.9865
Beans	-0.69	-0.09	0.76	-0.06	-0.83	0.9650
Bread	-0.35	188.99	-0.06	-0.06	-0.53	1.0039
Yam	1.44	-139.07	-1.22	0.08	-0.64	1.0055
Garri	-0.41	38.71	0.51	0.08	-0.38	1.0057

LN = Natural logarithm of price

Expenditure elasticity estimates revealed that rice and bean are the food items regarded as

necessities after suspension of tariff on rice importation. This shows that zero tariff policy on rice during this period has a positive impact on the purchasing power of households, thus allowing the demand for rice not to be affected by income shock. This study showed that the majority of households in the study area were within the active age range. Also, about 84% of the respondents are male, with more than half being professionals. The mean household income was ₦105, 500. There was a decrease in expenditure share allocated to rice after the suspension, which might be a result of reduction in price of imported rice after the suspension. Before the tariff suspension, rice was being regarded as luxury item by the households, with other food items serving as a substitute for rice. However, the rice was regarded as a necessity after tariff suspension probably due to reduction in price of rice brought about by zero tariff policy implemented during this period.

Conclusions

Policies are instruments used by government to achieve macro-economic objectives like food security; relevant issues for policy makers can be inferred from the findings of this study. One of the macro-economic objectives of any nation is to make enough food available to its populace, thereby making them food secure through ensuring a satisfactory balance between food demand and food supply at reasonable prices, and that their food entitlements are greater than their food requirement in terms of having the purchasing power to effectively demand food to satisfy their institutional and physiological requirements. The following recommendations emanated from the course of the study: Government should ensure flexibility in their trade policy (tariff suspension), especially when food crisis is being witnessed in the economy as observed in this study and tariff suspension policy should not be a long term food policy measure as this might discourage local production, which in turn will serve as a hindrance to achieve food self-sufficiency.

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