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Urban Rice Demand Analysis: A Case Study of Ijebu Ode Township

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Abstract: Current efforts towards reviving the nations' economy encourage the imposition of bottlenecks that would discourage importation and boost local production where possible. Rice, an important commodity in the world over and especially in Nigeria, is particularly of a major concern to economic policy formulation given the possibility of its been produced in sufficient quantities locally and yet is still be largely imported. This research work focuses attention on the urban demand for different rice types with a view to understanding the consumption pattern for imported and local rice commodity and discovering the reasons for which either one is preferred to the other. Solutions that would encourage local production over the imported rice commodity are then proffered on the basis of the observed consumption pattern.

Key words: Urban rice demand · Ijebu Ode Township

INTRODUCTION

Nigeria was traditionally an agricultural country providing the bulk of its' own food needs and exporting a variety of agricultural goods, cocoa, rubber and many other cash crops. However, by the 1970's, oil had supplanted cash crops as the major source of foreign exchange and transformed Nigeria's economic fortunes. After oil prices collapsed during the 1980's the federal and state governments embarked upon ambitious development programme aimed at diversifying the economy. The over-dependence of the economy on the oil sector led to a neglect of the agricultural sector, which remained substantially subsistence in character. The failure of this subsistence agricultural sector to keep with the rapid population growth led the country into importation of food. The issue of food importation came to the fore as a result of the perennial food shortages and inadequacy of the agricultural sector to cater for the nation's food need. Food imports into Nigeria in the recent past had assumed astronomical proportions, such that successive governments have classified some of the imports as "essential commodities". By this is meant that the survival or otherwise of the citizenry is being dictated by the rise and fall on the barometer of the quantities of the importation of these essential commodities [1]. According to Akintola [1], consumer's taste has become so adapted to these foreign goods that any ban on their importation may be strongly opposed.

Rice commodity, one of the most widely imported agricultural commodity in Nigeria, is of special significance in economic transformation as its' grains are used extensively as food and is statistically reported as constituting the principal food of half the human race, Nigeria not exclusive. Thus, a breakthrough in the local production of rice would signify a major breakthrough in the reformulation of economic policies as it affects food importation and in turn save the country some foreign exchange. For a study of this nature, rice commodity is considered as either the imported rice commodity or the locally produced rice commodity. In Nigeria, rice importation has been significant since the 1970's. The government commits staggering sums of money in foreign exchange to milled rice imports; between 1961 and 1999, Nigeria spent more than $4 billion on rice importation alone, giving an average annual import value of $102 million [2]. As is evident in Table 1 below, since 1970, the value of expenditure on rice imports had steadily increased from =N=9.32 million in 1970 to =N=16484.9 million in 2000 and its percentage with regards to total food imports on the increasing side. This situation poses a question in ones' mind of what could cause the large volume of importation. Is it that locally produced rice in the local markets is scarce? Or perhaps could it be that consumers' taste has become so firmly set that locally produced rice is no longer desirable? Or is it that people have become so economically enabled that imported rice now appeal to them as ostentatious goods? Or could it be

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Table 1: Nigerian food imports (Special emphasis on rice commodity)

Period	Food imports	Rice imports	Rice imports as % of food imports
1970-1975	91.350	9.320	10.20
1976-1980	673.122	526.196	78.17
1981-1985	1357.930	827.132	60.90
1986-1990	1432.840	416.705	29.08
1991-1994	8262.740	3412.870	41.30
1995-2000	52873.300	16484.900	31.18

Source: Nigeria Trade Summaries (several years)

CBN Annual Reports (various issues)

Figures are given in millions of naira

Sthat locally produced rice are of inferior quality? The Nigerian government in recognition of this problematic situation in 2002, started encouraging local production of rice, with an anticipated harvest target of 3.5 million metric tons per year. Right now, the country produces an average of 3.5 million metric tons of rice each year, as against the 1.45 million metric tons produced in the 1990's; even at this, the domestic rice production remains significantly low, as Nigerians consume about five million metric tons of rice per annum [2]. Therefore the attempt by this paper to investigate whether the problem is that of inadequate local rice production, or that of inadequate demand volume for local rice as well as understanding the demand pattern for imported and local rice as well as the factors that determines the demand pattern, becomes necessary.

Thus, the objectives of this work are as follows

To determine the preference of consumers between locally produced rice and imported rice.

Classify imported rice and locally produced rice using basic income elasticity parameters.

Proffer recommendations based on findings.

THEORETICAL BACKGROUND AND RESEARCH METHODOLOGY

The theory of consumer behavior is the fundamental theory on which this research is conducted. The principal assumption on which the theory of consumer behavior and demand is built is that, a consumer attempts to allocate his limited money income among available goods and services so as to maximize his satisfaction [3]. The usefulness of the theory lies in the fact that it can help us to understand how consumer demand responds to income. According to the neoclassical economic theory of consumer behavior, each individual consumer is confronted with market determined prices of various commodities, with the consumer having only a known and fixed money income. It is these prices, according to Ferguson [3] that help the consumer to allocate his or her income to the various goods and services. Thus according to the theory, the amount of a commodity that a consumer would purchase therefore depends on the prices of the commodity and the money income of the consumer. Literature also asserts that commodities with negative income elasticities are said to be inferior, those with income elasticities between zero and one are said to be normal and a commodity with an income elasticity greater than one is said to be superior. Consumption pattern varies from one area to the other. This usually is the result of socio-cultural and economic differences while level of education is an important factor in consumption. However, income and price seem to be the dominant factors to reckon with. Income limits the extent to which one can expend on food, whether price of such commodity is high or low. Apart from prices and income being major factors in determining consumption pattern, household size could also be another important factor. According to Idumah [4] households with larger family size have a higher food budget.

Again the pattern of consumption varies not only from one area to another but also from one group of households to another. In the Nigerian context, many researchers grouped the populace into three income groups, namely, low, middle and high-income households. According to Ojo [5], 60% of the earning of the low income households is spent on food, 45% of the middle income household is spent on food, while a little over 33% was asserted to be spent on food by the high income households.

In the last 30 years or so,there had been a number of food demand related studies. The pioneering work after which this research work is patterned was carried out by Anthonio and Oni [6]. According to available records on their work in the empirical analysis of food expenditures in Nigeria with data from Ibadan City, sixty respondents were interviewed and the sampling done from three settlement area in Ibadan classified as low-income households, middle income households and high income households. From the research, it was discovered that about 62% of the total income of the low income households is spent on food: this percentage declined to about 39% for middle income households and declined further to about 16 % for the high income households, a confirmation of Engel's law. The empirical analysis also showed a drop of income elasticity for all food from 0.92 for the low income households to 0.63 for the middle income households and 0.58 for the high income households.

The area used for the purpose of this research is the urban settlements of Ijebu Ode Local Government Area within Ogun State in Nigeria. Data utilized for this study were obtained from a household consumer survey. The survey covered three major areas in Ijebu Ode, namely Igbeba Housing Estate, old Ondo road settlement and Adefisan settlement areas. The old Ondo road settlement represents represent a largely middle income area, while the Igbeba Housing estate represents a typical high-income area and Adefisan settlement represents a relatively low-income area.

Twenty household samples were drawn from each of these areas, making the total sample size of sixty. The sampled household in each area was by systematic random sampling; selecting every tenth residential address on a road. Structured questionnaires were used to obtain relevant responses from the sampled household units.

For the purpose of analysis, households earning between less than =N=10000.00 and =N=30000.00 per month were classified as low-income households. Those earning between =N=30000.00 and =N=60000.00 were classified as middle-income group; while those earning above =N=60000.00 are classified as high-income group.

At Igbeba Housing estate, all the respondents belonged to the high-income category. However, for old Ondo road settlement, ten out of the twenty households interviewed belonged to the middle-income category, six belonged to the low-income households and four to the high-income category. The same pattern was displayed in Adefisan settlement area, where fifteen of the twenty households interviewed belonged to the low-income group, four to the middle-income group and one to the high-income group.

The total number of households belonging to the high-income category out of the sixty respondents was twenty five (41.6%); for the middle-income, the figure stood at fourteen (23.3%), while for the low-income category, the figure stood at twenty.

Analytical procedure: The assumption of a given relationship between rice expenditure and income can be explicitly expressed in form of a simple linear equation

$Y = b_0+b_1X+U$; Where Y= expenditure on rice.
X = disposable income
U = error term.
b_0 = constant term.
b_1 = parameter to be estimated.

For the purpose of this research work, regression analysis was carried out with expenditure on imported and local rice as the dependent variables and household disposable income per month, prices facing households and household size, as the explanatory variables.

For local rice when the sign for the estimated parameter for income is negative, then we conclude that local rice is viewed as inferior commodity; when the parameter estimated for prices for local rice is negative, we conclude that is an inferior commodity. When the reverse is the case, the converse could be accepted. Household size is expected to influence household consumption positively. For the imported rice, the sign for the parameter estimated for income when positive indicates that it is a superior or normal commodity. When the parameter estimated for prices of imported rice is negative, it indicates that it is a superior commodity.

RESULTS AND DISCUSSION

From this table, it can be observed that 4 out the 60 indicated that their level of income is a militating factor in the type of rice they consume, another 5 indicated price as the militating factor in the rice type consumed; 51 out of the 60 households interviewed indicated that it is the quality of the rice type consumed that influence their consumption of it.

Three functional forms were fitted for each of the sets of equation; the linear, simple logarithm and inverse functional forms. In both cases of the imported and local rice, the linear functional form was the most satisfactory in terms of its t-values, the expected signs and the R-sq.
For the local rice, the sign of regression coefficient for income was negative which suggests to us that local rice consumption is negatively related to income, that is as income increases, lesser quantities of this commodity would be consumed. Thus local rice can be viewed in this respect as inferior commodity. The sign of the regression coefficient for prices of local was positive, an indication that as prices increase, more quantity of the commodity would be consumed. The sign of the regression coefficient for household size was positive too, suggesting that as household size increases, more of local rice would be consumed.

For imported rice, the regression coefficient for disposable income was positive which suggests to us that as income increases, more quantity of imported rice would be consumed, that is imported rice is a normal or superior or superior good. For price, the regression coefficient had a negative sign suggesting that as price increases, lesser

quantity of imported rice would be consumed. The regression coefficient for household was positive suggesting to us that as household size increase, consumption of imported rice would increase.

Of all the three functional forms fitted for imported rice expenditure in the medium income households, the inverse form was chosen as the one with the best fit.

The regression coefficient for income had a positive sign, which indicates that as income increases the consumption of imported rice would increase. Again the regression coefficient for rice commodity price was negative was negative indicating that as prices increases, the quantity consumed of imported rice would decrease. Household size had a regression coefficient whose sign was positive indicating that as household's size increases, more quantity of imported rice would be consumed.

Of all the functional forms fitted for this income group, the simple logarithm form was selected as having the best fit. The sign of the regression coefficient for income was positive indicating a positive relationship; the sign of the regression coefficient for commodity price was negative, indicating a negative relationship while the sign for household size was positive indicating a positive relationship.

CONCLUSION

From the result presented, it is quite evident that income is a significant determinant of rice expenditure as well as price and household size. Level of educational attainment also indicated a pattern consistent with the idea that those households with higher educational background consume a higher quantity of imported rice.

Of a serious consequence is the view held by 85% of the respondents that the major motivation for their consumption of imported rice is its taste, neatness, quick cooking potential unlike the local rice commodity. This suggests that perhaps if the quality of local rice could be improved and made comparable with the imported rice, then it would be possible to increase the market for local rice in Nigeria.

RECOMMENDATION

It is evident from this research work that all the income groups interviewed would increase their consumption of imported rice with every increase in disposable income and decrease their consumption of local rice with increase in their disposable income. The reasons for this behavioral pattern are given in Table 2 where 85.0% of the respondents indicated their preference for imported rice because of its being time saving in eliminating the problem of stone separation from rice preparation, its neatness and its high quality; 8.3% of the respondents indicated the high price of imported rice as discouraging their consumption of imported rice even though they would preferred consuming it in larger quantity; in the same vein 6.7% of the respondents indicated their meager income as a responsible factor for their reduced consumption of imported rice and high consumption of local rice.

Table 2: Factors affecting rice type demanded

Factors	Frequency	Percentage	Cumulative
Income	4	6.7	6.7
Price	5	8.3	15.0
Taste	51	85.0	100.0
Total	60	100.0	

Table 3: Regression result for low income households

	b_0	b_1	b_2	b_3	R-sq.
Y_{LR}	-82258.5	-0.2145	0.2139	0.596	0.483
		(-0.366)	(2.14)	(0.74)	
Y_{IR}	221.86	10.09	-66.08	6.88	0.542
		(0.622)	(-0.74)	(2.48)	

Figures in parentheses are the t-values.

Y_{LR} = Expenditure of Household in =N=/month on local rice

Y_{IR} = Expenditure of Household in =N=/month on imported Rice.

b_0 = constant term

b_1 = Estimating parameter for household disposable income

b_2 = stimating parameter for price of rice commodity

b_3 = Estimating parameter for household size

Table 4: Regression result for medium income households

B_0	b_1	b_2	B_3	R-sq.
3151.36	99608	-1.006	-30974	0.628
	(2.4)	(-0.93)	(-2.8)	

Values in parentheses are the t-values

b_0= constant term

b_1= Estimating parameter for household disposable income

b_2= Estimating parameter for prices of rice commodity

b_3= Estimating parameter for household size

Table 5: Regression result for high income households

	b_0	b_1	b_2	b_3	R-sq.
YIR	-476.85	75.06	-21.79	233.8	0.49
		(2.47)	(-2.48)	(0.93)	

The figures in parentheses are the t-values

b_0= constant term

b_1= Estimating parameter for household disposable income

b_2= Estimating parameter for rice commodity prices

b_3= Estimating parameter for household size

Therefore suggestions to be made in this work are directed in the direction of encouraging local production of rice and discourage the heavy importation of rice, which is crippling the ailing rice industry. Given that the price (s) of local rice is relatively affordable to the consumers, it becomes advisable to encourage government and private individual to invest in the processing of local rice given that the marginal cost would not be such as would unnecessarily overshoot the price of local rice above that of the imported rice. Again, import duties in the form of tariffs should be levied on the importation of rice as this would serve to encourage local rice production. The overemphasis of consumers on the undeniable good qualities of imported rice should be cut down to size by also setting up of a nutrition body that would see to educating the public on the advantages of local rice over imported rice.

Imposition of import duties: Import duties in the form of tariffs by the government would serve to protect the domestic rice production industry against foreign competition and achieve a favourable balance of trade. Other useful instruments that could also be employed in order to protect the domestic rice production industry could include the enactment of "The Corn Law". The Corn Law once employed in Great Britain was a form of regulation applied to the import and export of grains. A similar law if enacted would serve to secure an adequate supply of grain to meet domestic requirements and maintain grain prices at profitable levels [7]. This law would place duties on imported and exported grains until such a time as the country's' grain production is sufficient for export purposes.

Establishment of nutritional campaign team: The side effects of consuming imported polished rice are a disadvantage to its consumption. For instance, the bulk of imported rice has the kernels polished with glucose and talc. This causes this imported polished rice to have little or no thiamin (the absence of which leads to a nutritional condition referred to as Beriberi); also polished rice is reputed to be in nutrients by nutritionists [7]. On the other hand, apart from the stony quality of local rice, it is reputed as being of high nutritional quality since it is not polished and also it better tastes. The need therefore arises for forming of a kind of mass campaign motivated by nutritionist pointing out the overshadowing benefits of consuming locally produced rice when they well processed.

Investment in rice processing: The need also arises for the government to invest in the procurement of rice processing facilities and inputs. Such investment could be in form of subsidy (s) or outright purchase of the processing facilities in order to facilitate rice production. This would serve not only to better the lot of the local farmers but also benefit the consumer and help the economy attain a positive balance of payment. Research has shown that of the over 4,500 milling machines in Nigeria, most of them are obsolete without modern milling accessories like de-stoners and rice graders. This tends to put local rice at a disadvantage as the consumers tend to prefer the parboiled rice, which is free of stones and impurities. Hence, investment in modern processing facilities for local rice would place the commodity in a better stance when compared with imported rice commodity. This would encourage local rice consumption and also afford the farmers a good price for the local rice commodity being produced.

Involvement of government and private sector participation: The involvement of government in the various stages of rice production may be necessary as well as that of private party (s). Certain stages of rice production and processing tend to be capital intensive and may not be easy for individuals to undertake. Such, includes the use of advanced processing facility as well as irrigation practices.

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