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Research Paper

Food Price Inflation and Household Welfare in Port Harcourt LGA (PHALGA) in Rivers State

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This study investigates the effect food price inflation has on household welfare in Port Harcourt LGA (PHALGA) in Rivers State. The study was anchored on consumer choice theory. The study gathered data from respondents using the survey research design. The population of the study was the number of households in PHALGA. A sample size of 399 respondents was drawn using the Taro Yamane formula. Cluster sampling technique was used to randomly select respondents from high, middle and low income groups based on the neighbourhoods they lived in and the non-parametric Kruskal Wallis ANOVA test was carried to examine the difference in consumption of food and non-food items among the different types of households. Findings show that most households in PHALGA earn below 500,000 naira. Findings also show that rising prices of food necessitated a reduction in food consumed and a reduction/stop in the consumption of other non-food items mostly by middle and low income households. High income households currently remain unaffected by rising food prices. Based on the foregoing, the study recommended that local food production should be developed in Rivers State to reduce shocks caused by rising prices in the international markets and that the government should look into providing a safety net for lower income households in the state.
Keywords: *price, income, food, inflation, household, welfare, Rivers State, Port Harcourt.*

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I. INTRODUCTION

Food is essential for life. It is the basic means of nourishment for all human beings. High food prices are a source of concern in poor countries because the poorest have been shown to usually spend a larger share of their budgets on food. Ivanic and Martin (2008) estimated that, in the wake of the 2007/2008 food crisis, the poverty headcount in low income countries increased by 105 million people out of the low-income population of 2.3 billion. There were unrests in various countries, particularly among urban consumers, due to rising food prices. Increases in the prices of food manifests in two ways; first, it would lead to a reduction in purchasing power of poor households and second, it would induce households to substitute away from expensive foods. According to Perloff (2016), ―a doubling of the price of goods the consumer buys is the same to a drop in the consumer ‘s income to half its original level. Even a rise in the price of only one good reduces a consumer ‘s ability to buy the same amount of all goods previously purchased. This is especially so when the commodity in question is a staple. There has been a consistent increase in the prices of food in cities in Nigeria over the past several months. Between January and April 2021, food prices in Nigeria have risen over 20% (Trading Economics, n.d.). All indicators suggest it is likely to climb higher still.

Nigerian households, like those in other developing countries, spend a significant portion of their income on food with little left over for other needs and wants (Wodon & Zaman, 2008). A survey of Nigeria in 2019 found that Nigerian households spend 56.65% of their income on food. It is slightly lower for urban households – 51.52% and much higher for rural households – 61.3%. (National Bureau of Statistics, 2020). In Rivers State the consumer price index (CPI) for food was 442 in March 2021 as compared to 353.9 in March 2020. The CPI overall was 377.6 in March 2021 compared to 317.7 in March 2020. (National Bureau of Statistics, 2021). This clearly shows that food prices are rising faster and faster in Rivers State eroding the real income of residents.

Household welfare is adversely affected by an increase in prices of food. Inflation lowers the purchasing power of individuals in society. Higher prices of food reduce the quality of food consumed and the number of meals consumed per day by households (Wood, et al, 2009) affecting both their physical and mental

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health. Higher food prices also mean a reduction in the ability of households to provide for their other needs and wants.

Therefore, this study set out to answer the following research questions:

i. How does food price inflation affect household food consumption?
ii. How does food price inflation affect household consumption of non-food items?

II. LITERATURE REVIEW

This research draws upon the Consumer Choice Theory as propounded by Eugene Slutsky in 1915. It posits that individuals are rational and make their purchase decisions based on what would maximize their utility or satisfaction given the prices of available commodities and their budget constraint. Households typically have a priority system of needs that is used to decide their purchases. For rational consumers, a price increase leads to two effects- income and substitution effects. The income effect means that as price increases households will consume less of those commodities whose prices have increased. The substitution effect refers to the allocation of resources to purchase substitute commodities that are relatively cheaper. So, if a household typically consumed wheat flour, they will buy less of wheat flour as its price rises and may switch to garri or any other cheaper alternative. Some goods are very basic known as giffen goods. As such they will be consumed by most households regardless of price as they typically have no close substitutes. This situation may not have a substitution effect in terms of price but still affects household welfare by reducing consumption of non-food items. Consumers make choices between their different wants given a certain level of income and the prices available in the market. These restraints mean that a consumer cannot obtain all that he/she would want and has to choose between competing ends. Given a budget constraint households optimize their consumption patterns to consume only the most important items first. A rise in prices means higher income spent on food and less on other household necessities such as clothes, health care etc. The less spent on other household necessities can be categorized as a loss of welfare.

Alem and Soderbom (2010), studied "Household-Level Consumption in Urban Ethiopia: The Impact of Food Price Inflation and Idiosyncratic Shocks". They used survey data to investigate how urban households in Ethiopia coped with the food price inflation in 2008. Qualitative data indicated that the high food price was the most adverse economic shock between 2004 and 2008, and that a large proportion of households had to alter their food consumption in response. Their regression results indicated that households which possessed low asset levels, and casual workers, were notably adversely affected by high food prices. They also found that household demographics and education mattered little for the impact of the shock. They noted the importance of growth in the formal sector as means of generate more well-paid and stable jobs. They also emphasized that aid programs responding to food price shocks can be made more efficient by targeting low-asset households with members on the fringe of the labour market.

Osei-Asare and Eghan (2013) researched "Food Price Inflation and Consumer Welfare in Ghana" using GLSS-5 household data. The Ghana Living Standard Survey (GLSS) is a multi-purpose survey of households in Ghana and collects information on different dimensions of living conditions in Ghana. It has enough information to estimate the total food consumption of each household in terms of expenditure on commodities. Expenditure endogeneity and truncated expenditures were controlled in the estimation process using the Augmented Regression Method and Heckman's two-stage procedure, respectively. Symmetry and homogeneity conditions were rejected in the unconstrained Linear Approximate- Almost Ideal Demand System (LA/AIDS) model. The study reveals that cereals and bread; fish; vegetables; and roots and tubers will continue to constitute important share of Ghanaian food expenditure as they collectively constitute 67% of future food expenditure. Food price inflation between 2005 and 2011 eroded real household food purchasing power by 47.18%in Ghana. They also discovered that the distributional burden of the effects of the rising food prices between 2005 and 2011 fell on rural poor consumers since they had the highest compensating variation.

Ogbuagu and Ewubare (2014) in their paper "Financial Deepening and Inflation in Nigeria: An Open Economy Model Approach" studied the short-run and long-run impact of financial deepening on inflation in Nigeria from 1980 to 2012 using open economy model. They obtained data from Central Bank of Nigeria Statistical Bulletin (2012) and United Nations Conference on Trade and Development (UNCTAD) Volume index. They used Auto-regressive Distributed Lag (ARDL) Model (coefficient Diagnostic Wald test and Variance Decomposition Test), to analyse their data. Their results showed that import volume index and exchange rate in lags 1 & 2 respectively are significant in explaining variations in the consumer price index (CPI) in the short-run while all other variable have no significant impact on CPI. Also, the short –run result indicates that financial deepening variables; Money supply to GDP ratio (MS2/GDP) ratio and private sector credit to GDP (PSC/GDP) ratio have no significant impact on consumer price index. While in the long-run, import volume index, prime lending rate and exchange rate are significant. The coefficients of lagged variables were tested using Wald Coefficient Diagnostic Test to see the impact of financial depth on the price level, and the result indicates a positive and significant impact of financial deepening on Consumer Price Index (CPI).

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Therefore, increase in money supply to GDP ratio (MS2/GDP) and private sector credit to GDP ratio (PSC/GDP) together generated consequent increases in price. The variance decomposition test indicates that shocks to MS2/GDP ratio can rarely cause variation in price level while shocks to PSC/GDP ratio can cause variations in prices more than any other variable both in the short-run and long – run. They advocated that appropriate monetary and exchange rate policies should be ensured as Nigeria moves towards achieving her financial depth goals.

Olubokun and Agbede (2018), carried out a study on "Food Price Inflation and Consumers' Welfare in Ondo State, Nigeria". They sampled 82 rural households in Ondo state using a Random Sampling Technique to generate information for the food groups. Demand for food groups was estimated using the Quadratic Almost Ideal Demand System (QUAIDS) technique and the welfare effect was estimated with both the QUAIDS and the Compensated Variation model. The QUAIDS model showed that apart from Plantain, all other estimated expenditure elasticities were all positive and statistically significant at the percent level, indicating that all the food items are normal goods. The Compensated Variation model indicated that households in Ondo State needed to be compensated around 24.9 percent of their total household expenditure on food in order to weather the adverse impact of food price inflation. They concluded that all households in Ondo State suffered welfare losses from food price inflation between January and October 2016. They recommended that government should try, as much as possible, to subsidize the prices of foodstuffs so that it can be accessible to households in Ondo State in order to improve their welfare.

III. METHODODLOGY

The study covered households in Port Harcourt LGA of Rivers State, Nigeria. Port Harcourt City LGA is one of the 23 local government areas in Rivers State, in the South of Nigeria. The survey research design was used and a questionnaire was administered to gather information from respondents. Given the sensitivity of the data, this study used broader welfare measures of shortages and perception instead of gathering data on monies spent by households in Port Harcourt. The study did not set out to measure demand but households' response to the rising prices of food.

The target population of this study comprised households in Port Harcourt LGA of Rivers State. The 2006, Port Harcourt LGA population of 538,558 persons and growth rate of 3.5% (National Population Commission, 2010) was projected to 2020 using the formula

Initial Population $(1+ \text{Growth Rate})^t$. The value of t is 14 (from 2006 to 2020).

Therefore, the estimated population of PHALGA in 2020 is:

$538{,}558(1+0.035)^{14} = 871{,}760.88 = 871{,}761$

Port Harcourt LGA also has about 5 persons per household. (National Bureau of Statistics, 2003). So the study population- total number of households will divide the total population of PHALGA by the average number of persons per household. P = 871,761/5 = 174,352.

The Sample size was selected using the Taro Yamane formula: $n = N/(1+Ne^2)$; where

n = the sample size; N =population size; e = level of precision or sampling of error; e = $\pm$5%

Given population as 174,352; the sample size n becomes: $174{,}352/[1+174{,}352(0.05)^2] = 399$

The respondents were sampled using the cluster random sampling method. The LGA was divided into clusters of high, middle and low income neighbourhoods. Communities in each cluster were selected at random. Old and New GRA were selected to represent high income, Oroworukwo was selected as middle income and Diobu was selected as low income. 133 questionnaires were distributed randomly in each cluster. The data was processed and presented in tables and percentages. The hypothesis was tested using Analysis of Variance (ANOVA) to see if a difference exists in the consumption patterns of high income, middle income and low income households due to food price increases. A Cronbach's alpha value of 0.744 was obtained giving an acceptable internal consistency.

IV. RESULTS AND DISCUSSION

The study conducted on households in Port Harcourt found out that most of the households have about 4-6 persons and in most of them only 1 person is formally employed. They have a lot of dependent and few disabled or chronically ill members. The major source of household income is formal employment of a household member and only 33% of households earn above 500,000 naira every month and as such are classified as high income households. So, majority of households are middle or low income. The tables below show how respondents record the effect of rising prices on food and non-food consumption.

Table 1: Effect of Rising Prices on Household Food Consumption (In Percentages)

	Never	Rarely	Sometimes	Often
In the past month, did you worry that your household would not have enough food?	33%	10.5%	36.8%	19.7%
In the past month, did you or any household member not eat your	33%	9.4%	34.9%	22.7%

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preferred food due to lack of resources?				
In the past month, did you or any household member eat a limited variety of food due to lack of resources?	33%	13%	30.5%	23.5%
In the past month, did you or any household member have to eat food you did not want to due to lack of resources?	33%	11.6%	35.2%	20.2%
In the past month, did you or any household member have to eat fewer meals a day because there was not enough food?	33%	12.7%	30.5%	23.8%
In the past month, was there ever no food to eat of any kind in your household because of lack of resources to get food?	33%	11.9%	33.5%	21.6%
In the past month, did you or any household member go a whole day and night without eating anything because there was not enough food?	33%	10.8%	32.4%	23.8%
In the past month, did you or any household member go to sleep at night hungry because there was not enough food?	33%	9.1%	34.9%	23%

Source: Field Survey, 2021

In Table 1 above, 67% of respondents in the past month have worried over the ability of their households to feed and have also not eaten their preferred food. They have also have eaten less than their usual number of meals or gone to bed hungry due to a rise in food prices.

Table 2: Effect of Rising Prices on Consumption of Non-food Items (In Percentages)

	Yes	No
Do you believe that the rise in food is making it more difficult to buy other things?	48.8%	51.2%
In the past month, did you worry that your household would not be able to afford non-food items?	42.7%	57.3%
In the past month, did you or any household member reduce their consumption of non-food items due to lack of resources?	33.8%	66.2%
In the past month, did you or any household member stop consuming any non-food item due to lack of resources?	42.7%	57.3%
In the past month did you or any household member decide to forgo one item considered less priority for another? E.g. forgoing clothing to buy medicine?	37.4%	62.6%

Source: Field Survey, 2021

48.8% of respondents believe that rising food prices make buying non-food items more difficult and 42.7% are worried about not being able to afford non-food items. 33.8% of them have had to reduce their consumption of non-food items in the past month. 42.7% stopped consumption of a non-food item in the past month and 37.4% of households have had to choose between two priority non-food items in the past month due to rising prices.

Analysis of Variance (ANOVA) was chosen to test the consumption differences between households at various levels of income. To carry out ANOVA, its assumptions were tested on the data collected. The two tests conducted were the homogeneity of variance test using the Levene test and the normality test using the Shapiro Wilk's test.

Levene's test showed that the variances for food consumption among the different income groups were not equal, $F(2,358) = 113.532$, $p < 0.001$. Therefore, the high, middle and low income households have unequal population variances when it comes to food consumption.

Levene's test showed that the variances for consumption of non-food items among the different income groups were not equal, $F(2,358) = 161.986$, $p < 0.001$. Therefore, the high, middle and low income households have unequal population variances when it comes to consumption of non-food items.

The Shapiro-Wilk's normality test was also carried out. The statistic has a p-value < 0.001. As a result, it was concluded that the sample is not normally distributed.

Given the violation of homogeneity of variance and normality, the non-parametric Kruskal-Wallis H test was used in place of the One-Way ANOVA to test the study hypothesis.

Hypothesis Testing

H_{o1}: Food price inflation has no effect on household food consumption.

The Kruskal-Wallis ANOVA test was carried out and the following result obtained:

Kruskal-Wallis Test

Ranks

	Income Class	N	Mean Rank
Food Consumption	Low Income	121	301.00
	Middle Income	121	180.00
	High Income	119	60.00
	Total	361	

Test Statistics

	Food Consumption

Kruskal-Wallis H	333.538
Df	2
Asymp. Sig.	.000

Source: SPSS Output

A Kruskal-Wallis test indicated that the effect of food price inflation on food consumption differed over the different income groups (H (2) = 333.538, p = <0.001). Pairwise comparisons using Dunn's test indicated that high income households were observed to be significantly different from those of middle income (p<0.001) and low income (p<0.001). Middle income households were also observed to be significantly different from low income households (p<0.001). As a result, the null hypothesis was rejected and it was concluded that food price inflation affects food consumption of households in Port Harcourt LGA and it affects different income groups differently.

H_{o2}: Food price inflation has no effect on household consumption of non-food items.

The Kruskal-Wallis ANOVA test was carried out and the following result obtained:

Kruskal-Wallis Test

Ranks

	Income Class	N	Mean Rank
Non Food Consumption	Low Income	121	294.90
	Middle Income	121	176.26
	High Income	119	70.00
	Total	361	

Test Statistics

	Non Food Consumption
Kruskal-Wallis H	302.329
Df	2
Asymp. Sig.	.000

Source: SPSS Output

A Kruskal-Wallis test indicated that the effect of food price inflation on consumption of non-food items differed over the different income groups (H (2) = 302.329, p = <0.001). Pairwise comparisons using Dunn's test indicated that high income households were observed to be significantly different from those of middle income (p<0.001) and low income (p<0.001). Middle income households were also observed to be significantly different from low income households (p<0.001). As a result, the null hypothesis was rejected and it was concluded that food price inflation affects consumption of non-food items by households in Port Harcourt LGA, Rivers State. It affects different income groups differently.

The results above are in line with the consumer choice theory as an increase in prices caused households to reduce their food consumption. It also led to households substituting for lower priced foods due to a drop in available resources. The rise in food prices also took resources away from non-food items that families typically consumed. It was especially noteworthy in lower income households with less resources generally. Families had to prioritize essential items and forgo the rest.

Given the fact that only 33% of the households surveyed reported no change in consumption of food and more than half reported less consumption of non-food items it is safe to say that rising food prices have caused a welfare loss to households in Port Harcourt.

V. CONCLUSION AND RECOMMENDATIONS

This study shows the differential effects of food price inflation on various households in Port Harcourt. It shows that low income households in neighbourhoods like Diobu are disproportionately affected as evidenced by having to choose between food and other items and even having to forgo food entirely for one or more family members. Middle income households like those in Oroworukwo are not spared as some experienced the same effects as the low income households. High income households found in Old and New GRA neighbourhoods note that food prices are definitely increasing but they remain relatively unaffected due to their higher incomes.

The study concludes food price inflation has reduced the overall welfare of families in Port Harcourt LGA in Rivers State. Given the importance of food to life and well-being this study recommends:

1. Agriculture should be developed in Rivers State. Local food production means less imports and less shocks due to price rises in the international markets.
2. Government should look into providing a safety net for lower income households in the state.

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