An Application of Ordered Logit Model in Investigating the Impact of Economic Crisis on Households' Consumption Behavior in Kano Metropolis, Kano State-Nigeria

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Abstract

There has been a significant decline in the purchasing power of households, increased unemployment and poverty in Nigeria due to the current economic crisis in the country. This study was designed to investigate the impact of the economic crisis on households' consumption behaviour in Kano Metropolis, Kano State-Nigeria. Data was collected from a sample of 269 civil servants with the use of a structured questionnaire. Simple percentage and Ologit regression techniques were adopted in the analysis of the data collected. It was found that the majority of the respondents were male and married and mostly possessed NCE/Diploma education qualifications. The result further reveals that due to the current economic crisis in the country, the likelihood of the civil servants' consumption behaviour is positively affected by the level of education, income, work experience and the practice of secondary occupation by the household, while the family size and change in price level affect the household consumption behaviour negatively. The study recommends that the government should formulate a suitable macro-economic policy to achieve price stability to improve the purchasing power of individuals and that wages of civil servants need to be increased to enable them to improve their consumption behaviour and general levels of living.

Keywords: Consumption, Economic Crisis, Inflation, Ordered Logit
JEL Code: D12, D91, E21, E32

1. Introduction

The economic crisis has an adverse effect on the economy and households' resources, resulting in decreased expenditure and most especially the standard of living of individuals. The current economic crisis in Nigeria was largely because of the domestic economic policies coupled with external factors which typically cause a large currency depreciation and changes in relative prices, thereby affecting consumer prices and the higher cost of imported goods. This necessitates most of the households in the country (especially fixed-income earners) to change their consumption behaviour by spending much of their income on food and other extreme necessities.

Every nation seeks to achieve steady economic growth to prevent the occurrence of recession. Moreover, price stability is equally important for the economic progress of a country. However, there is a trade-off in achieving the two goals simultaneously. Economic growth helps countries to fight poverty, generate employment, and bring foreign exchange among other things. On the other hand, price stability ameliorates households' welfare. Nigeria's recession of 2016 was attributed to a decline in demand for crude oil in the world market. As a result, the price of crude oil crashed to a large extent. Nigeria is one of the largest exporters of oil and relies on crude oil as the main source of foreign exchange. Oil accounts for 92% of the country's foreign exchange earnings (National

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Bureau of Statistics, 2018). The country imports refined petroleum products from abroad even though it produces crude oil. Massive importation of manufactured goods coupled with the decline in the price of crude oil led to a serious foreign exchange crisis in the country which led to the depreciation of the local currency. The general price level skyrocketed during the period of the recession.

However, it is agreed that recession coupled with inflation is an unfavourable phenomenon to households especially the fixed income earners such as salary earners, pensioners, and the like. This is because their earnings don't adjust to price changes; this makes it difficult to adjust their expenditure to price changes. They often change their spending pattern to manage their lives. In this case, the households are expected to save less and spend less proportion of income on luxury goods and more on necessity goods (particularly food). Some may even spend their total income on necessary goods without saving a single penny.

Nigeria plunged into economic recession after witnessing -1.7% and -2.06% GDP in the first and second quarter of 2016 respectively (National Bureau of Statistics, 2016). The International Monetary Fund (IMF) and the Central Bank of Nigeria (CBN) projected that Nigeria's economy might not regain its stability until early 2017 with a low growth rate of 1.5% (National Bureau of Research, 2016). In a free market economy, aggregate demand plays a vital role in economic growth. Many economists, especially Keynesian Economists, are of the view that consumer spending is the most important determinant of economic performance in the short run. Therefore, it is against this background this paper will investigate the impact of the recession on fixed-income earning households spending patterns, particularly civil servants in Kano Metropolis, Nigeria.

2. Literature Review

Recession is laterally defined as a period of decline in economic activities. The economic activities comprise the production, distribution, and consumption of goods and services. In other words, a recession is a general downturn in the economy. The recessionary period is associated with rising unemployment, reduction in Growth of Domestic Products (GDP), aggregate investment, aggregate demand and other related macroeconomic variables. According to Noko (2016), the recession is a negative real Growth Domestic product growth rate lasting for at least two consecutive quarters. A recession normally comes with

a drop in the following five economic indicators such as real Growth Domestic Product (GDP), real income, employment, industrial production and wholesaler-retail Sales (National Bureau of Statistics, 2015). A recession is a significant decline in economic activities that reflects on real GDP, income level of individuals, government revenue, employment levels, and manufacturing among others. Recession can also be seen as a business circle contraction which leads to a general slowdown of the country's economic activities for two consecutive quarters. This implies that a decline in GDP for only one quarter of the year is not a recession. When recession persists and worsens beyond a certain period it becomes depression.

Empirical studies try to analyze the effects of recession on household expenditure in different countries over the world. For instance, Abunar and Alam (2017) investigated the impact of the economic downturn on consumer purchasing habits in Saudi Arabia using descriptive statistics and correlation analysis. The result of the study reveals that the economic shock in Saudi Arabia had significantly reduced consumers' purchasing power. It further reveals that the consumers reduced the expenditure on entertainment. They also switched from consumption of expensive food to non-expensive one. Likewise, Asfaw, *et al.*, (2022) studied the effect of a pandemic on household welfare in the Afar region of Ethiopia using a fixed effect model. The study found that the total expenditure of the household during the period goes to food and food-related items. Thomas *et al.,* (2013) assess household consumption during the recession in the United Kingdom using retail price index data. The study found that during recessionary periods in the UK, a significant decline in household consumption has been recorded. The fall in consumption is more on consumer durable goods.

Moreover, Aminu and Oyefesobi (2018) assessed the impact of the recession on consumption patterns in Lagos, Nigeria. The result of the correlation coefficient shows that there was a strong relationship between recession and changes in household consumption patterns. A similar study was conducted in Ogun State, Nigeria by Adewale *et al.*, (2018) on the effect of recession on consumers' buying behaviour in Ogun State, Nigeria. The result of simple regression indicates that inflation influences consumers' buying behaviour. Thus, consumer purchases depend on inflation faced during the recessionary period. Similar findings were obtained by Danlad *et al.*, (2019) that recession decreases the consumers' purchasing power.

The previous studies conducted on the impact of recession didn't investigate the effects of the crisis on

fixed-income earners, despite that fixed income earners are the most vulnerable group during the economic crisis because economic downturns in developing countries normally come alongside inflation. This paper studies the impact of the recession on fixed income earners particularly civil servants in Kano Metropolis, Kano State-Nigeria. The area is one of the most populous areas in Nigeria and an area with rapid urbanization.

3. Research Methods

This study uses a quantitative survey research design. It was conducted in the Kano metropolis in Nigeria. Therefore, three hundred thirty-one (331) questionnaires were distributed to household heads who are working with the government (public service) in the area, in only two hundred sixty-nine (269) were retrieved with valid responses. Thus, the response rate stood at 81.2%. A simple probability sampling technique was used to select the sample of the research. Descriptive statistics were employed for univariate analysis while the ordered logit regression model was utilized for analyzing the effect of economic crisis on household consumption behavior.

3.1 Model Specification

This study uses Ordered Logit (Ologit) to address the micro economic impact of economic crisis on the consumption behaviour of households in Kano Metropolis, Kano State-Nigeria. The rationale was due to the categorical natural ordering of the dependent variable, that is, whether the perceived effect of the crisis *was highly*, *slightly* or *did not* affect the consumption behaviour of the respondents. The model is specified as follows:

CONB=f(EDUC,FMSZ,PRCH,INCM,WEXP,SOCC)… … … … … … … … … .iii

Specifically, the model is further re-specified in econometric form as:

$CONB=\beta_0+\beta_1EDU+\beta_2FMSZ+\beta_3PRCH+\beta_4INCM+\beta_5WEXP+\beta_6SOCC+u_i… … … .iv$

Where:
CONB = Household Consumption Behavior
FMSZ = Size of the family of the household
PRCH = Price changes or inflation
INCM = Income of the household

WEXP = Working experience of the respondent
SOCC = Secondary occupation or non-civil service businesses
u_i = Error term
β = regression coefficient measuring change in dependent variable due to change in the regressors.

4. Results

4.1 Socio-Economic and Demographic Characteristics of the Respondent

The socioeconomic and demographic profiles of the respondents were examined under major variables that include gender, age, marital status, level of education and size of the family. The result of the analysis is presented in Table 1 below.

Table 1. Result for Socio-economic and Demographic characteristics of the respondent

S/N	Variable	Frequency	Percentage (%)
1	**Gender**		
	Male	176	65.43
	Female	93	34.57
	Total	**269**	**100.00**
2	**Age**		
	18 – 34 years	138	51.30
	35 – 54 years	100	37.17
	55 – above years	31	11.52
	Total	**269**	**100.00**
3	**Marital Status**		
	Married	166	61.71
	Single	59	21.93
	Divorce	32	11.90
	Others	12	4.46
	Total	**269**	**100.00**
4	**Level of Education**		
	Secondary Certificate	23	8.55
	NCE/Diploma Certificate	144	53.53
	Degree Certificate	99	36.80
	Post-graduate Certificate	03	1.12
	Total	**269**	**100.00**
5	**Size of the Family**		
	4 and Below Children	149	55.39
	5 – 9 Children	94	34.94
	10 and Above Children	26	9.67
	Total	**269**	**100.00**

Field survey, 2023.

Based on the result from Table 1 above, the result presented shows that the male respondents constitute 176 representing 65.43% and the females constitute 93 respondents which represent 34.57% of the total responses. Looking at the age distribution, the respondents between 18-34 years represent 51.30%, 37.17% within the age range of 35-54 years and only 11.52% were respondents that are 55 and above years. More so, the marital status of the respondents from the table revealed that the majority of the respondents representing 61.71% are married while those that are either single, divorced and others (like widows) are 21.93%, 11.90% and 4.46% respectively. Therefore, it could be concluded that the majority of the civil servants in the study area were male, mostly within the productive age and married.

Furthermore, the educational status of the respondents as in Table 1 reveals only 8.55% have secondary certificates, 53.53% possessed NCE or Diploma certificates, 36.80% acquired degree certificates and just 1.12% have post-graduate certificates (like Masters, PhD). This shows that the majority of the respondents have secondary school education.

Moreover, on the size of the family the respondents with 4 or fewer children are 149 which represents 55.39% of the respondents, while those that have 5-9 children are 94 representing 34.94% and those with children from 10 to above are only 26 which represents 9.67% of the total respondents. This revealed that most of the respondents have 4 or fewer children in the study area.

4.2 Analysis of Food Consumption Expenditure Amidst Economic Crisis

Table 2 below shows the descriptive statistics of the influence of the economic crisis on food consumption expenditure of the respondents, that is, civil servants in Kano Metropolis.

Table 2 above shows that about 89.96% of the respondents experienced an increase in food expenditure

Table 2. Whether the current economic crisis leads to an increase in food spending

Variable	Frequency	Percentage (%)
Yes	243	89.96
No	27	10.04
Total	269	100.00

Source: Field Survey, 2023

during the economic crisis. Conversely, only 10.04% of the respondents did not experience an increase in food expenditure. The majority of the respondents spent a greater proportion of their income during the economic crisis on the purchase of the same quantity of food prior to the crisis or even less at a higher cost due to a fall in their purchasing power resulting from a price surge. This could also affect their ability to save and ability to purchase other goods and services. Fixed income earners suffer during the period of price surge, as their income doesn't increase with the general price level. It can be said that the economic crisis in the country has affected the consumption behaviour of the respondents in the study area by making them stop or reduce the consumption of durable goods.

4.3 Model Estimation Result

The Ordered Logit (Oligit) estimation for the analysis of the household's response to expenditure given the present economic hardship in the country is presented in Table 3. Ologit is used considering the nature of the dependent variable which is ordered categorical with category 1 if the household is highly affected by the current economic hardship, 2 if slightly affected and 3 if not affected.

Given the ordered categorical nature of the dependent variable, the perceived effect of the economic crisis on consumption behaviour was estimated to empirically explain the effect of the explanatory variables on the dependent variable, and the result is reported in Table 3 above. The effects of the constant in the model are absorbed in the threshold parameters (cut points), and it shows that the three ordered choices of the households are significantly distinct given that cut1 and cut2 are significantly different from one another. Similarly, the variables in the model are jointly statistically significant with 0.000 probability values and the R^2 shows that the explanatory power of the models is 14%.

The level of education as an explanatory variable, positively affects the consumption behavior of the household amidst the current economic crisis in Nigeria. As the household head acquires an additional year of education, his consumption behaviour amid the economic crisis is more likely not to be affected. The marginal effect further explains that as the level of education of the household increases by one year, he is 0.04% more likely not to be affected by the economic crisis, 0.2% more likely to be slightly affected, and 0.2% less likely to be

Table 3. The result of the estimated Ordered Logit (Ologit) regression

S/N	Variables	Model Coefficient	Marginal Effect		
			Highly Affected	**Slightly Affected**	**Not Affected**
1	Education Level	0.0092 (0.253)	-0.002	0.002	0.0004
2	Family Size	-0.598** (0.257)	0.126	-0.027	-0.027
3	Price Changes/ inflation	-1.849*** (0.303)	0.392	-0.084	-0.084
4	Income Level	0.000002 (0.000002)	-0.0000005	0.0000004	0.0000001
5	Work Experience	0.00005 (0.00005)	-0.00001	0.000008	0.000002
6	Secondary Occupation	0.527*** (0.184)	-0.112	0.087	0.024
Threshold parameters *Cut1 = -2.280* *Cut2 = -0.113*					

Number of observations   = 259

LR chi^2 = 56.99
Prob > chi^2 = 0.0000
Pseudo R^2 = 0.1351

Authors' Computation using stata 16, 2023
1. Standard Error in parentheses
*2. *** 1% level of significance; ** 5% level of significance; * 10% level of significance*

highly affected. This finding is in line with the a priori expectation that more education will increase awareness. People with a high level of education are expected to have better coping strategies than those with a lower level of education.

More so, as the size of the family household increases, his consumption behaviour amidst the economic crisis in the country is less likely not to be affected. In other words, the increase in the size of the family household highly affects his consumption behaviour amidst the economic crisis. The coefficient of family size is a negative and significant predictor of household change in consumption behaviour, and its marginal effect shows that, as one person increases in the size of the family, the likelihood of the household consumption behaviour being highly affected increases by 12%, less likely to be slightly affected by 4% and less likely not to be affected by 2%.

Furthermore, the effect of a price change or inflation on household consumption behaviour in the current economic crisis is a negative and significant determinant. The coefficient of the variable shows that price changes are less likely not to affect consumption behaviour. The marginal effect of the coefficient revealed that a unit increase in the price of goods and services is associated with 39% likelihood of the household consumption behaviour being highly affected; 30% and 8% less likely to be slightly and not affected respectively. This result

is in line with the a priori expectation given that the respondents (civil servants) are fixed income (salary) earners. This finding conforms to the findings of Adewale *et al.,* (2018) and Danladi *et al.,* (2019).

Similarly, the level of income as a determinant of household consumption behaviour in the current economic crisis of the country shows that with a higher level of income, the consumption behaviour of the household is more likely not to be affected as revealed by the coefficient of the variable in the model. A ₦1000 increase in the income level of the household is associated with 0.0005% less likely to be highly affected, 0.0004% more likely to be slightly affected, and 0.0001% more likely not to be affected. The finding is in line with a priori expectation that the demand for higher income groups is inelastic compared with that of the lower income group.

The working experience of the household is another determinant of household consumption behaviour amid the country's economic crisis. The coefficient of the variable indicates that working experience positively affects the consumption behaviour of the household. Based on the result of the marginal effect, as the working experience of the household increases by one year, the likelihood of the household consumption behaviour being highly affected decreases by 0.001%, more likely to be slightly affected by 0.0008% and more likely not to be affected by 0.0002%. The finding is in line with a priori

expectation. Because the workers' salaries increase as their years of service increase. Moreover, their experiences offer them opportunities to get part-time jobs and consultancy services.

If the household has a secondary occupation, his/her consumption behaviour during the economic crisis in the country is more likely not to be affected compared with the civil servants that do not have a secondary occupation. The marginal effect of the coefficient revealed that the household that practices any other economic activities is 11% less likely to be highly affected by the country's current economic crisis, 8% and 2% more likely to be slightly and not affected respectively. This outcome is in line with a priori expectation that income diversification serves as insurance for economic shocks to households.

5. Conclusion and Recommendations

The current economic crisis in Nigeria has negatively affected major macro-economic variables in the country which in turn affect the consumption behaviour and welfare of individuals. There has been a significant decline in the purchasing power of households, increased unemployment and poverty as well as reduced levels of savings and household consumption in states of the country. This study investigates the impact of the current economic crisis in Nigeria on the consumption behaviour of households among fixed income earners, particularly civil servants in Kano State. Based on the findings of the study, it could be concluded that there exists a significant association between the economic crisis and the consumption behaviour of the household in the study area. The result shows that the level of education, income, work experience and the practice of a secondary occupation or non-civil service business has a positive impact on the consumption behaviour of the household, while the family size and change in price level affect the household consumption behaviour negatively. Therefore, it could be confirmed that the economic crisis in the country has resulted in a high cost of living due to a fall in purchasing power because of rising prices, reduction in the value of income, loss of jobs and reduction of workers' salaries; thus, affecting the buying capacity of the household leading to changes in the household consumption behaviour in the study area.

Based on the findings of the study, the following recommendations are drawn to enable improving the welfare of households.

i. The government should formulate suitable macro-economic policies aimed at stabilizing price levels to improve the purchasing power of individuals in the country.
ii. The wages of civil servants need to be increased to enable them to improve their consumption behaviour and general levels of living.
iii. Civil servants should engage in additional economic activities to supplement and serve as an additional source of income to take their consumption expenditures.

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