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INFLATION AND PERSONAL CONSUMPTION EXPENDITURE IN NIGERIA

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Abstract

Inflation is a major economic challenge in Nigeria, Africa and the World in general as it reduces the purchasing and investment power thereby lowering welfare. Over the years, there has been some unresolved issues on whether inflation has the potential to induce personal consumption expenditure. There is, however a dearth of information and hence the need for further investigation. Times series data on personal consumption expenditure, exchange rate, inflation rate and lending interest rate were gathered from the Statistical Bulletin of Central Bank and World Development indicator. Philip perron unit root test and Autoregressive Distributed Lagged Model (ARDL) were used for the analysis. The outcome of the study revealed that inflation rate and consumption expenditure were all stationary at levels. Inflation rate with its lagged values significantly impacts the consumption expenditure in Nigeria in the short run. The ARDL showed an inverse relationship between inflation rate and personal consumption expenditure. A percent change in inflation rate reduces personal consumption expenditure by 6.4%. Based on the findings, the study recommends an urgent need for effective monitoring of inflation rate by monetary authorities.

Key words: Inflation, Personal consumption expenditure, Nigeria

1.0 Introduction

The general rise in the price of various goods or services over a period of time is known as inflation. Inflation has become a topical issue globally and in Nigeria in particular as it leads to reduction in the supply of basic needs of citizens, which eventually reduces the standard of living.

Inflation has remained a major challenge in Nigeria since 1970s and has caused reduction in economic growth and standard of living of households. Personal consumption on the other hand consists of expenditure on goods or services that are used for the meeting people's need. Moreover, increase in inflation can have adverse effects on the consumption of the various economic units (Osuji,2020). Factors such as household size, education, wealth, financial stability, inflation affect consumption expenditure. Personal consumption expenditure accounts for 65% of Gross domestic product in Nigeria (World Bank,2020, Holm *et al.*, 2020).**1**

5 Inflation has for many years been prominent in Nigeria and has a great effect on consumption. Several studies such as Babalola *et al.* (2022); Osuji (2020) and D'Acunto *et al* (2016) have looked at the effect of inflation on government consumption expenditure, literatures that focused on the effect of inflation on personal consumption expenditure are relatively scarce. Authors such as Nyambe and Kanyeumbo (2015), Egbulonu and Wobilor (2016), Mehraraa, Soufianib and Rezaei (2016) discovered that personal expenditure impact positively on inflation, while others like Olayunbo (2013), Peter (2015) are of the view that personal expenditure negatively impact on inflation while other like Ogbonna (2014), Ojarikre, Ezie and Torka (2015), Ogbole and Momodu (2015) did not find any relationship. To this end, this study seeks to investigate the relationship between personal consumption expenditure and inflation in Nigeria. The following questions emanated from the study:

(i) What is the relationship between inflation and personal consumption expenditure

in Nigeria?

(ii) What is the short run relationship between inflation rate and personal consumption

expenditure in Nigeria?

(iii) What is the long run relationship between inflation rate and personal consumption

expenditure in Nigeria.

The main objective of the study is to examine the relationship between inflation and personal

consumption expenditure in Nigeria. The specific objectives are to:

(i) investigate the effect of inflation on personal consumption expenditure in Nigeria.

(ii) examine the short run relationship between inflation and personal consumption

expenditure in Nigeria.

(iii) assess the long run relationship between inflation rate and personal consumption

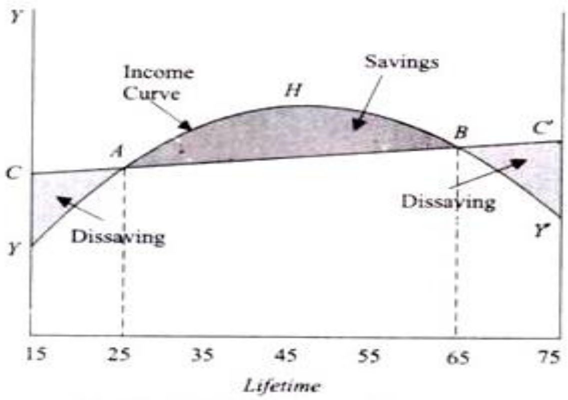
expenditure in Nigeria.

2.0 Literature Review/ Theoretical Framework

2.1 Life Cycle Theory of Consumption

The theory underpinning this study is the post-Keynesian theory of consumption by Modigliani and Ando which is known as life cycle theory. According to this theory, the consumption in any period is not the function of current income of that period but of the whole lifetime expected income. Thus, in life cycle hypothesis the individual is assumed to plan a pattern of consumption expenditure based on expected income in their entire lifetime. It is further assumed that individual maintains a more or less constant or slightly increasing level of consumption. However, this level of consumption is limited by his expectations of lifetime income. A typical individual in this theory in his early years of life spends on consumption either by borrowing from others or spending the assets bequeathed from his parents. It is in his main working years of his lifetime that he consumes less than the income he earns and therefore makes net positive savings. He invests these savings in assets, that is, accumulates wealth which he consumes in the future years. In his lifetime after retirement, he again dis-saves, that is, consumes more than his income in these later years of his life but is able to maintain or even slightly increase his consumption in the lifetime after retirement.

Fig 1: Life Cycle Theory of Consumption



Source: https://www.economicsdiscussion.net/consumption-function/the-life-cycle-theory-of-consumption-with-diagram/14495.

2.2 Empirical Literature

Empirical studies have found mixed evidence on the relationship between personal consumption

and inflation in Nigeria. A study by Lieb and Schuffels (2022) on the relationship between inflation and consumption spending in Netherlands using fixed effects linear probability model (LPM) and Conditional logit (CL) regression model revealed that a price increase in the consumption spending in the short-run reduces consumption in the long-run. Similarly, Osuji (2020) result on consumption expenditure in Nigeria for the period of 1981 to 2018 using Ordinary least square econometric method provided evidence of a positive significant long run relationship between inflation and household consumption expenditure in Nigeria. Furthermore, Ekong and Effiong (2020) from Ghana discovered a positive and significant effect on household consumption expenditure, while interest rate and savings exerted a negative and significant effect on household consumption expenditure which supports the Keynesian position. Contrary, Babalola *et al.*, (2022) empirically assessed the impact of inflation on consumption expenditure and economic growth in Ghana between 1990 and 2020. The study found that in the long run, inflation has a negative significant effect on personal consumption expenditure, while interest rate and gross domestic product have positive significant effects.

3.0 Model Specification

Following the consumption function framework, this study specifies a functional relationship

between consumption expenditure and inflation and other variables as:

PCE = *f* (INF, INT, EXR) (1)

Where:

PCE = Personal Consumption Expenditure, INF = Inflation rate; INT=Interest rate and

EXR= Exchange Rate.

Equation (1) can be re-written in a linear form as follows:

$$PCE_t = \beta_0 + \beta_1 INF + \beta_2 \mathrm{INT} + \beta_3 \mathrm{EXR} + \mu_t \quad (2)$$

Where:

β_0= constant term.

$\beta_1 - \beta_4$ = coefficient of variables to be estimated μ_t = Stochastic error term.

$\beta_1 < 0; \quad \beta_2 < 0; \quad \beta_3 < 0$

The Autoregressive Distributed Lag (ARDL) specification of equation (3) above is presented below:

$$PCE_{t=}\beta_0 + \sum_{i=0}^{p} \beta_1 INF_{t-1} + \sum_{i=0}^{p} \beta_2 INT_{t-1} + \sum_{i=0}^{p} EXR_{t-1} + \delta_1 (INF)_{t-1} + \delta_2 INT_{t-1} + \delta_3 EXR_{t-1} + v_t \ldots.(3)$$

Where δ_i are the long run multipliers.

The conditional ARDL long run model can be established as:

$$PCE_{t=}\delta_0 + \delta_1 INF_{t-1} + \delta_2 INT_{t-1} + \delta_3 EXR_{t-1} + U_t \ldots.(4)$$

The short run dynamics parameter was obtained by estimating an error correction model associated with the long run estimate. This is expressed as:

$$PCE_t = \beta_0 + \sum_{i=0}^{p} \beta_1 INF_{t-1} + \sum_{i=0}^{p} \beta_2 INT_{t-1} + \sum_{i=0}^{p} \beta_3 EXR_{t-1} + ECM \ldots.(5)$$

Where ECM = error correction mechanism.

$\beta_1 < 0$; $\beta_2 < 0$ and $\beta_3 < 0$

4.0 Analysis of Results

14.1 Descriptive Statistics of the Variables

Table 1 presents the descriptive statistics of all the variables used for the analysis.

Table 1: Descriptive Statistics of the Variables

Variable	Obs.	Mean	Std. Dev.	Min	Max
LINFL	32	1.162	0.275	0.731	1.862
LNECR	32	2.010	0.166	1.697	2.436
LNGCE	32	1.804	0.099	1.554	1.939
LNINTR	32	0.817	0.344	-0.037	1.260

Source: Authors Computation, 2024

4.2 Unit Root Test for Stationarity

To ascertain whether the series were stationary, an Augmented Dick-Fuller unit root test was applied.

Table 2: Unit Root Stationarity Test

Variables	Test Statistics	Critical values 1%	Critical values 5%	P value	Integrated order	Conclusions
LINFL	-2.951	-3.716	-2.986	0.0398	I (2)	Stationary
LNECR	-3.541	-3.716	-2.986	0.0093	I (1)	Stationary
LNPCE	-2.603	-3.716	-2.986	0.0923	I (0)	Stationary
LNINTR	-4.292	-3.709	-2.983	0.0005	I (0)	Stationary

Source: Authors Computation, 2024

4.3 Auto-regressive Distributed Lag

Table 3 presents the outcome of the auto-regressive distributed lag (ARDL) model, a robust statistical tool used to determine the impact of inflation on household consumption expenditure in Nigeria from 1990 to 2022. The model demonstrates a Log likelihood of 66.65632, which is highly significant at Prob > F of 0.0000, underscoring the model's fitness and significance. The R-squared and Adjusted R-squared values of 0.9096 and 0.8374, respectively, indicate that 90% and 83.7% of the explanatory variables were accounted for in the model. A lower root MSE value suggests a better fit for the ARDL model, and a higher root MSE implies larger prediction errors. Therefore, a value of 0.0306 suggests that the model's predictions are, on average, closer to the actual observations.

Over to the estimation of the result, the lagged consumption expenditure was significant at 1% with a positive coefficient, implying that consumption expenditure positively influences the inflation rate in Nigeria. Also, the inflation rate, with its lagged values, significantly impacts the consumption expenditure in Nigeria in the period under review.

Table 3: Auto-regressive Distributed Lag Regression

Variable	Coeff.	Std Er	t-value	P-value
LNPCE				
L 2.	0.568***	0.169	3.350	0.004
INFLR				
L1.	-0.073	0.052	-1.400	0.183
L2.	-0.026	0.057	-0.460	0.655
L3.	-0.103*	0.058	-1.790	0.094
L4.	-0.154***	0.051	-3.030	0.008
LNEXC				
L1.	0.326***	0.092	3.560	0.003
L2.	0.393***	0.105	3.740	0.002
L3.	-0.413***	0.069	-6.010	0.000
lNTRT	0.072	0.031	2.330	0.034
_constant	0.653	0.233	2.800	0.014
Prob > F	0.0000			
R-squared	0.9096			
Adj R-squared	0.8374			
Log likelihood	66.65632			
Root MSE	0.0306			

Source: Computation from Stata, 2024

4.4 ARDL Long Run Coefficient Estimate

The long run coefficient estimates of the auto regressive distributed lagged model is presented in Table 4.

Table 4: Long Run Coefficients Estimates

Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
INFLR	-0.0641	0.0253	-2.533	0.0000
INTRT	-0.136758	0.094030	-1.454405	0.1008
LNEXC	0.017232	0.182737	0.094301	0.9256
C	1.986383	0.407211	4.878022	0.0000

Source: Authors Computation using STATA 12

The long run coefficient estimates of the ARDL showed that a negative relationship exists between inflation rate and personal consumption expenditure. Result showed that a percent increase in inflation rate reduces personal consumption expenditure by 6.4%. Interest rate is also negatively related to personal consumption expenditure but not statistically significant at 5 percent significant level. The result of exchange rate showed a direct relationship with personal consumption expenditure.

4.5 Diagnostic Tests

In Table 5, we present the Akaike and Bayesian information criteria. The Akaike's Information Criterion (AIC) is a measure of the relative quality of a statistical model for a given set of data. It balances the goodness of fit of the model with the complexity of the model, penalizing models that are too complex. In general, lower values of AIC indicate better-fitting models. For this study, an AIC value of -107.3126 indicates that the model has achieved a relatively good balance between goodness of fit and complexity.

The Bayesian Information Criterion (BIC), like the AIC, is a measure used for model selection in statistics. It balances goodness of fit with model complexity, but it penalizes complexity more heavily than the AIC. For this study, a BIC value of -89.99398 suggests that this model is relatively better at balancing goodness of fit and complexity compared to alternative models.

Similarly to the AIC interpretation, lower BIC values indicate better-fitting models.

Table 5: Akaike's information criterion and Bayesian information criterion

Model	N	ll(null)	ll(model)	DF	AIC	BIC
	32	32.99948	66.65632	13	-107.3126	-89.99398

Breusch–Pagan/Cook–Weisberg test for heteroskedasticity

H_0: Constant variance

$chi_2(1)$ = 0.03

Prob > chi2 = 0.8601

This shows that the model is free from heteroskedasticity problems. In other words, there is constant variance of the residual.

5.0 Conclusion

The result of the effect of inflation on personal consumption expenditure from 1990 to 2022 in Nigeria using the Autoregressive distributed lagged model (ARDL) showed that inflation rate was not stationary at the first difference but stationary at the second while consumption expenditure was stationary at level. Furthermore, the Autoregressive distributed lagged model (ARDL) employed in the study showed that inflation rate with its lagged values, significantly affects the consumption expenditure in Nigeria in the period under review. All the diagnostic test conducted on the variables were robust. Personal consumption expenditure and inflation are important determinant of economic growth in Nigeria. Based on the findings, the study recommends an urgent need for effective monitoring of inflation rate by monetary authorities.

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