THE CONCEPT OF VALUE CHAINS IN AGRICULTURE, CLIMATE ACTION AND ENVIRONMENTAL RESOURCES

GLOBAL ISSUES & LOCAL PERSPECTIVES

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Preface

This book adopts an exegetical approach as well as a pedagogic model, making it attractive agriculture and environmental economics teachers, professional practitioners and scholars. It is eschews pedantry and lays bars the issues in such clarity that conduces to learning. The book elaborates on contemporaneous ***The Concept of Value Chains in Agriculture, Climate Action and Environmental Resources*** issues of global significance and at the same time, is mindful of local or national perspectives making it appealing both to international and national interests. The book explores the ways in which climate change, food security, national security and environmental resources issues are and should be presented to increase the public's stock of knowledge, increase awareness about burning issues and empower the scholars and public to engage in the participatory dialogue climate change, food security, national security and environmental resources necessary in policy making process that will stimulate increase in food production and environmental sustainability.

The Concept of Value Chains in Agriculture, Climate Action and Environmental Resources: Global issues and Local Perspectives is organized in three parts. Part One deals with The Concept of Value Chains in Agriculture, Part Two is concerned with The Concept of Climate Actions and Part Three deals with the Concept of Value Chains and Environmental Resources.

Eteyen Nyong/ Ignatius Onimawo

April 2025

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Chapter Fifteen

Empirical Analysis Between Inflation and Poverty In Nigeria

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1.0 INTRODUCTION

Different s scholars opined that the link between inflation and other socio -economic problems including unemployment and poverty. Economic growth of a country is reflected in low poverty rate and low inflation rate .Siyan, Adegiriola and Adolphus(2016) also agreed that unemployment, poverty and inflation are harmful global economic phenomenon that affects people in various depths and levels at different times and phases of existence. According to Encyclopedia(1989) cited in Ijaiya, Ijaiya,Bello and Ajayi s(2011),the concept of poverty can be seen from two different perspectives: 1.moneylessness, this means both insufficiency or lack of cash and chronic inadequacy of resources of all types to satisfy basic needs such as nutrition, rest, housing, healthcare, etc. 2. Lack of power or powerlessness which means those who lack the opportunities and choices open to them and whose lives seem to them to be governed by constraints and persons that cannot be controlled .

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According, Ayodeji, Olayiwiola and Habeeb (2022), the trade-off between poverty and inflation rate is contentious in literature. Many economic scholars have considered different factors or variables that affect inflation because it is a direct effect of some monetary decisions and market deficiency . Several studies have found a link between inflation and poverty. Studies including Powers (1995), , Ravallion (1998), Cardoso (1992) Braumann (2004), Chaudhry(2008), Danlami, Hidthrir and Hassan (2020).while such studies tried to link poverty with inflation, other studies opined that poverty and poverty incidence cannot be explained with the concept of inflation. Anyawu (2023) asserts that poverty affects both the people affected and the national economies of countries affected.

On the other hand, Inflation according to Lassoued(2018) can be seen as a general and long-term process of cumulative increase in the general level of prices; It can also be seen as a macroeconomic variable that allows the use of other indicators to judge the total performance of an economy including poverty levels.

Problem Statement.

The Nigeria economy continues to suffer from high rates of inflation and high poverty rates. High cost of living has driven many Nigerians below the poverty line. According to the National Bureau of Statistics(NBS) 2022, multidimensional poverty and poverty in different dimensions are higher in rural ar

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eas in Nigeria where 72% of people are poor, compared to 42% of people in urban areas. Approximately 70% of Nigeria's population live in rural areas. Also, according to NBS, 2022, on a year-on-year basis, the headline inflation rate in Nigeria in October 2022 was 21.09%

OBJECTIVES OF THE STUDY

The main objective of the study is to examine the incidence of poverty and inflation in Nigeria from 1980-2015. The specific objectives are to :

(1). Examine the relationship between inflation and poverty in the period under review

(2) examine the trend in poverty from 1980-2022.

LITERATURE REVIEW

Existing literatures have tried to study the impact of inflation on poverty in both developed and developing countries. The desire by governments world over to reduce poverty and control inflation has inspired several authors to examine the relationship between inflation and poverty. Arize,Farber,Constanza and Wilson (2002) in a study titled Inflation and Structural Changes in Developing Countries used quarterly inflation data from 50 developing countries to examine whether inflation rate is stationary non stationary. Results from the study revealed non stationary inflation.

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Conceptual Clarification

Poverty Theory

This study adopts the theory of individual Deficiencies. The individual difference theory was propounded by Charles Darwin in 1859.The theory of individual differences is premised on the opinion that people vary significantly in characteristics, abilities, traits and needs. According to Williamson(2018), individual differences point out the reality of traits that distinguish individuals. Willamson(2018) also cited Baumeister and Vohs(2007) who defined individual differences in terms of enduring psychological characteristics that distinguish one person from another..

Empirical Review

Ijaiya, Ijaiya & Bello (2011) conducted a study titled economic prowth and poverty Reduction in Nigeria using a multiple regression analysis. Results from the study indicate that change in economic growth is prone to poverty reduction. The study further recommends sustained economic growth in order to reduce poverty. Studies on poverty includes Von Hauff and Kruse(1994), Yahie (1993), Aku etal.,(1997).In addition, Ayodeji, Olayiwola and Habib (2022) carried out a study on poverty incidence and inflation rate nexus in Nigeria from 1981-2020.The study employed the multiple linear regression and interactive model to achieve its objectives. Findings from the study revealed inflation rates positively correlates with Nigeria's

poverty and recommends government should ensure inflation rates are maintained at bearable digits while monetary and fiscal authorities should review upward lending rates to discourage excessive borrowing without productivity.

Murjani(2019) conducted a study on inflation, unemployment and economic growth to ascertain whether poverty correlates with inflation and unemployment. The study employed the Autoregressive Distributive Lag(ARDL) to analyze data from 1997 to 2016. The study findings revealed that the rate of inflation had positive and significant effect on poverty.

Again , Siyan et al., (2017) examined the implication of unemployment and inflation on poverty level in Nigeria from 1980-2014 using the Johasen test and VAR model to test the relationship among the variables. Findings from the study revealed two- way causality between poverty and unemployment rate. While, there is a single- way causality between unemployment rate and inflation rate. The study then recommends that government should give incentives to producers to enable them increase domestic production which will b ring down price level. Also, Yelwa, Okafor and Awe(2015) investigated the relationship between unemployment, inflation and economic growth in Nigeria using ordinary least square method to analyze secondary data. The study findings revealed that inflation and unemployment had inverse effects on Nigeria economic growth. The study further recommends that government should continue to improve macroeconomic instruments to achieve a sustained increase in domestic

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output. Fujii(2013) carried out a study on food inflation on poverty in Philippines between June 2006 and June 2008 found increase in head- count index to be larger for non-agricultural households than agricultural households.

Furthermore, Chimobi(2010) , examined inflation and economic growth in Nigeria from 1970 to2005 using granger causality test and co integration test. The findings from the study revealed no co integration relationship among inflation and economic growth during the time period reviewed.

METHODS AND MATERIALS

The Study Area Nigeria

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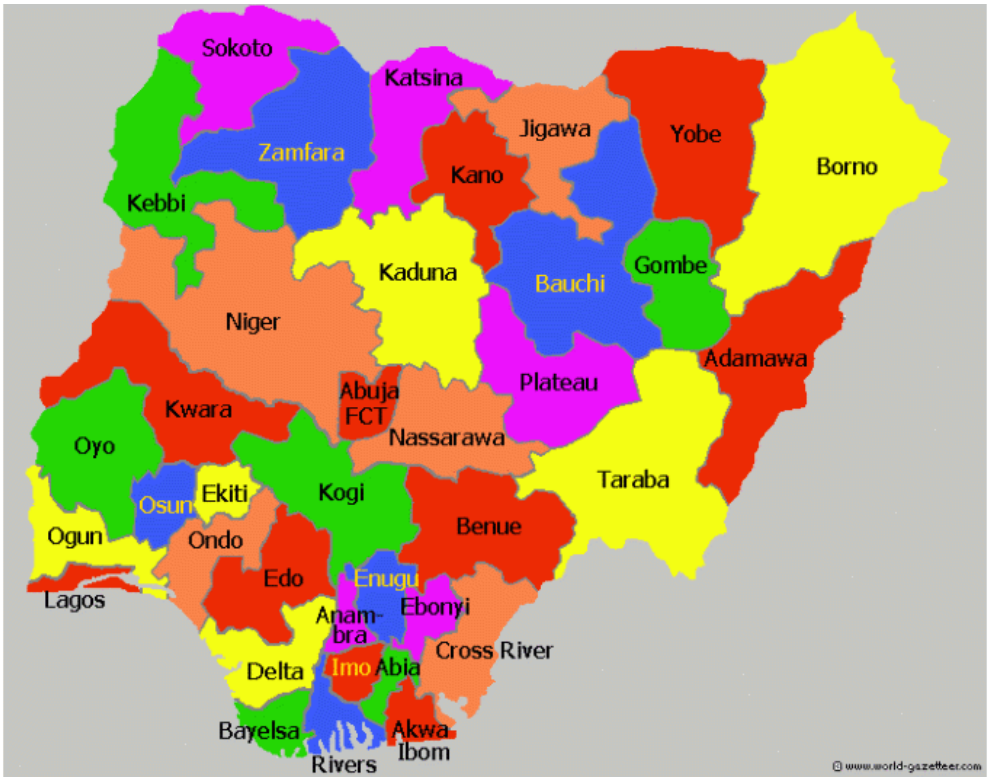


Nigeria is located on the west of Africa and it borders tha North Atlantic ocean , between Benin and Cameroon . The country Nigeria covers about 356,668 square miles. It has 36 states and Abuja as the Fedral Capital Teritory(FCT). Thew population of Nigeria is estimated at 200 million .Nigeria has a bout 250 ethnic groups. The Gross Domestic Product (GDP) of Nigeria as at 2020 was $440.83Billion .

Sources of Data/ Analytical Technique

Time series data for this study was sourced from World Development Indicators 20 23.

Variables in the model were subjected to a unit root test using the Augmented Dickey-Fuller

(ADF) test to determine the stationarity levels of the series. Further analysis like the ARDL Optimal Lag Selection and AIC Graph Showing Optimal Model lag Selection Summary were also applied on the data collected

MODEL

The model for this study is adopted from Isiaka et,. Al (2022)

The model is given below as:

$POV = \beta_0+\beta_1 INFL+\mu$ …….. (1)

$POV = \beta_0+\beta_1 INFL+\beta_2 MS$ …… …….. .. . .. (2)

$\beta_0+\beta_1 INFL+\beta_2 MS+\beta 3\ INTR+ \beta_4$ TX …… …….. (3)

$POV = \beta_0+\beta_1 INFL+\beta_2 MS+\beta 3\ INTR+ \beta_4$ TX+β5(INFL*INTR) …….. (4)

$POV = \beta_0+\beta_1 INFL+\beta_2 MS+\beta 3\ INTR+ \beta_4$ TX+β5(MS*INTR)…… (5)

Where POV = Poverty

INFL= Inflation

MS= Money Supply

INTR= Interest Rate

$\beta_0+\beta$= Parameters

μ= Error Term

RESULTS AND DISCUSSIONS

Unit Root Test

The variables of the model were subjected to a unit root tests using the Augmented Dickey-Fuller (ADF) test to determine the stationarity levels of the series. The results of the test is therefore presented in Table 1

Table 1: ADF Statistics of the Variable

Variables	ADF Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value	Prob.	Integration Order
POVL	-10.00262	-3.600987	-2.935001	-2.605836	0.0000	I(1)
INFL	-3.157388	-3.596616	2.933158	-2.604867	0.0299	I(0)
MSR	-7.431644	-3.600987	-2.935001	-2.605836	0.0000	I(1)
EXCR	-6.440468	3.600987	-2.935001	-2.605836	0.0000	I(1)
SAVR	-3.028747	-3.596616	-2.933158	-2.604867	0.0403	I(0)

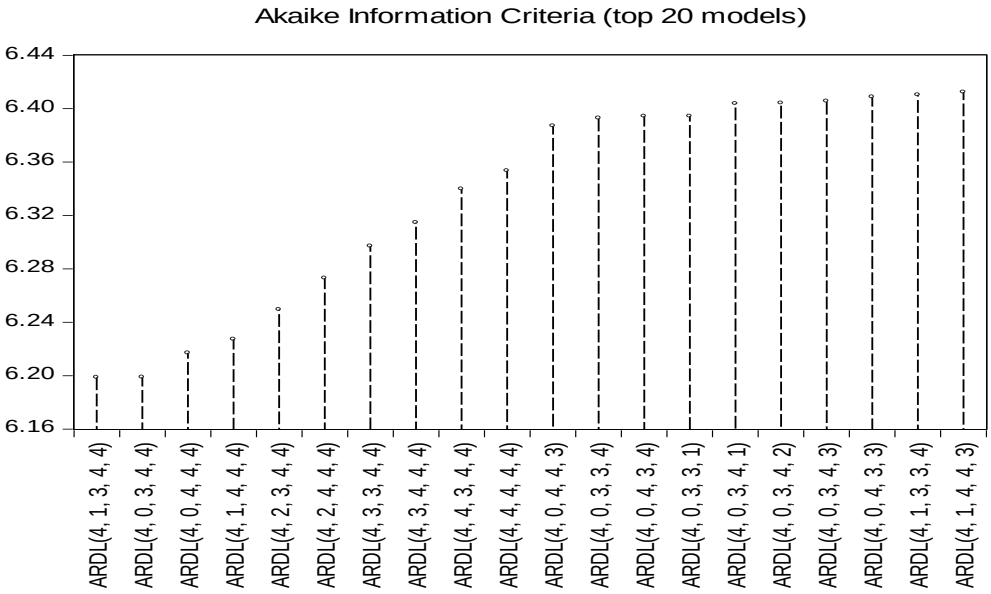
Source: Authors' Computation using E-Views 9.0 Version, 2023

Table 4.1 indicates that; POVL, MSR and EXCR are integrated at order one I(1) while INFL and SAVR are stationary at level I(0). This condition warrants the application of ARDL methods which accommodates series that are either I(1) or I(0) process or the mixture of both. The stationarity tests are necessary to guard against spurious regression and to ensure no variable is integrated of order two. The test was based on Akaike Information Criterion (AIC) which was selected automatically.

Analysis of ARDL Estimated Results

ARDL Optimal Lag Selection

The Akaike information Criterion was used to select the optimal lag for the ARDL estimated models. The graph of the optimal model selection summary is presented in figure 1.



Source: Extraction from E-Views 9.0 Version, 2023

Figure 1: AIC Graph Showing Optimal Model lag Selection Summary

Figure1 shows that, 20 ARDL model specifications were considered.in view of this, an ARDL (4,1,3,4,4) was finally selected. However, it can also show some other specifications performed in terms of minimizing Akaike information criteria(AIC)..

4.2.2 ARDL Bounds Test

The Autoregressive Distributed Lag (ARDL) Bounds test approach to co-integration was employed to investigate if the variables used for the study converge in the long-run. The ARDL Bound test result is therefore, presented in Table 4.2

Table 2 : ARDL Bound Test to Cointegration

Test Statistic	Value	K
F-statistic	5.311717	4
Critical Value Bounds		
Significance	**I0 Bound**	**I1 Bound**
10%	2.45	3.52
5%	2.86	4.01
2.5%	3.25	4.49
1%	3.74	5.06

Source: Authors' Computation using E-Views 9.0 Version, 2023

Table 2 shows that long-run relationships exist among the variables of the study because the F-Statistic value (5.311717) is greater than the lower I(0) and upper I(1) bounds of the critical values at 5% significant value. This means that there is a long-run relationship between inflation and poverty incidence in Nigeria from the period of the study.

ARDL Long Run Coefficients

The ARDL long-run coefficients were estimated to examine the long-run impact of the independent variables on the endogenous variable having established that, long run relationship exist among the variables. The estimated result of the ARDL long-run coefficients are presented in Table 4.3.

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Table 3: ARDL Long-Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INFL	0.118550	0.142713	0.830687	0.04170
MSR	0.097744	0.143094	0.683080	0.03033
EXCR	-0.086845	0.139300	-0.623436	0.05408
SAVR	0.030031	0.010013	0.299920	0.00280
C	0.350604	5.405372	6.486215	0.00000
Adj. R^2	0.765250			
F-statistic	7.193723			
Prob. (F-statistic)	0.000049			

Source: Authors' Computation using E-Views 9.0 Version, 2023

Table 3 shows that, if all other things were held constant, inflation (INFL) showed a positive and significant relationship with poverty incidence (POVL) in Nigeria, a unit increase in inflation rate increases poverty incidence by approximately 12% in the long run for the economy within the period of the study. This is in line with a'priori expectation as increase in inflation eroded the purchasing power of consumers which will reduce their access to basic needs of life in an economy thereby increasing their poverty level.

Similarly, it revealed that, money supply (MSR) indicated positive significant impact on poverty incidence (POVL) within the period of the study. This shows that, in the long-run, 1% increase in

the rate of money supply would raise poverty incidence approximately by 10% in Nigeria. This is possible in view of the fact that, increase in the rate of money supply in the economy can cause out-of-control inflation ; if more money is available in circulation, the value of each unit of money will decrease given an unchanged level of demandin the economy.

On the contrary, the ARDL result of long-run coefficients shows that, exchange rate (EXCR) indicated an inverse but insignificant relationship with poverty incidence in Nigeria for the period of the study. It shows, 1% increase or appreciation in exchange rate would reduce poverty incidence approximately by 9% in the economy all things been equal. The result however contradicts a'priori expectation but is possible for Nigeria economy because as a major exporter of crude oil, appreciation in exchange rate implies more money for the economy given rise to economic growth. Economic growth benefits all citizens of a country and also, reduce poverty in the country. If economic growth raises the income of everyone in a society in an equal proportion, then the distribution of income will not change.

Furthermore, the ARDL result of long-run coefficients shows that, savings has a positive and significant impact on poverty incidence in Nigeria. This implies that, 1% increase in saving would increase poverty incidence in the economy by approximately 3%, all things been equal. The finding does not meet a'priori expectation because savings are used for investments. An increase in investments is bound to boost economy growth which may translate into improve standard of living. However, the result of the study is an indication that, saving in the Nigerian economy is not enough to stimulate economic activities that will translate to improve welfare of the citizens. This could be attributed to low per capita income and rising inflation which eroded the purchasing power of the citizen hence increase in poverty incidence.

The intercept (C) value of 0.350604 means that if the value for all the variables include in the model were fixed at zero, poverty incidence in Nigeria will rise approximately by 35%. The

adjusted R^2 value of 0.765250 means there is about 77% of variation in poverty incidence and is explained by the exogenous variables included in the estimated model; an indication of high explanatory power of the variables included in the model of the study. The F-Statistic indicated overall significance of the estimated model at 5% level of significance or 95% confidence level.

ARDL Short-Run Form

The study further ascertains the short-run dynamics of the estimated model having established long-run relationship and effect of the exogenous variables on endogenous variable. The short-run ARDL coefficients are presented in Table 4.4

ARDL Short-Run Dynamics of Estimated Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(POVL(-1))	0.072386	0.228503	0.316783	0.7551
D(POVL(-2))	1.409292	0.250374	5.628745	0.0000
D(POVL(-3))	0.930311	0.345361	2.693733	0.0148
D(INFL)	-0.121621	0.067410	-1.804201	0.0880
D(MSR)	0.114505	0.028915	3.960065	0.0009
D(MSR(-1))	-0.059085	0.044417	-1.330234	0.2001
D(MSR(-2))	0.173482	0.049017	3.539225	0.0023
D(EXCR)	0.059977	0.039245	1.528269	0.1438

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D(EXCR(-1))	-0.015062	0.061782	-0.243786	0.8102
D(EXCR(-2))	-0.002916	0.054798	-0.053219	0.9581
D(EXCR(-3))	0.149771	0.064384	2.326212	0.0319
D(SAVR)	-0.000012	0.000006	-2.212057	0.0401
D(SAVR(-1))	-0.000008	0.000004	-1.938075	0.0685
D(SAVR(-2))	0.000005	0.000003	2.045434	0.0557
D(SAVR(-3))	-0.000007	0.000003	-2.369092	0.0292
CointEq(-1)	-0.477357	0.203330	-2.347697	0.0305

Source: Authors' Computation using E-Views 9.0 Version, 2023

From the Table 4 above, if all things were held unchanged, the short-run result shows that poverty incidence has insignificant positive influence on itself at 1 year lag, but indicated positive and significant influence from lag 2 up to lag 3. However, current year inflation rate indicated inverse and insignificant influence on poverty incidence in the short-run for the economy. The rate of money supply has significant positive impact on poverty incidence at current year and lag 2 while at lag 1, money supply has an insignificant negative impact on poverty incidence for the economy within the study period. The exchange rate has an insignificant positive impact in the current year, insignificant negative impact at lag 1 and 2 but significant positive impact at lag 3 on short-run poverty incidence in the economy. Savings rate has negative and significant influence on poverty incidence at current year and lag 3 but negative and insignificant influence on poverty incidence at lag 1 while at lag 2, it indicated positive and insignificant influence on poverty incidence in Nigeria for the study period.

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The estimated co-integrated or error correction term (ECT) shows a negative and statistically significance at 5 per cent confidence level. This indicates a significant speed of adjustment at which the previous year's shock of the explanatory variables converges back to the long-run equilibrium in the current year. This further implies that, the speed of adjustment to where poverty incidence will equilibrate even when there is initial disequilibrium in the short-run is at the rate of 48% approximately. On average, short-run results are in tuned with the long-run results.

Post Estimation Tests

The tests for normality, serial correlation, heteroscedasticity, model mis-specification and stability were conducted for the estimated model. The results for residual tests are presented in Table 4.5 and figures 2.

Table 5 : Residual Tests

Test	**Null Hypothesis**	**F-statistics**	**Prob. Value**
Jarque-Bera (JB)Test	Series residuals are normally distributed	1.811491	0.4.4241
Breusch Godfrey Serial Correlation LM Test	No Serial Autocorrelation	4.066950	0.0573
Breusch-Pagan Godfrey	No Hetroscedasticity	0.463488	0.9506
Ramsey Reset	No Misspacification	0.110081	0.7441

Source: Extracts from E-Views 9.0, 2023

Table 4.5 indicated the result of JB statistic which reveals that, the null hypothesis which states that; the series residuals are normally distribution is accepted because the p-values (0.4.4241) is greater than 5% significant level.

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Similarly, the result of Breusch-Godfrey Serial Correlation LM Tests for the estimated model reveals the acceptance of null hypothesis of no Serial Correlation as the F-statistic probability values (0.0573) for the estimated models is significance at 5% level.

In the same vein, the Breusch-Pagan-Godfrey heteroscedasticity Test reveals the acceptance of the null hypothesis that disturbance terms exhibit the equal variance assumption of homoscedasticity for the estimated model. This is because the probabilities value (0.9506) of F-statistic is statistically significant at 5% level.Also, the estimated result of the Ramsey RESET Test for model specification reveals the acceptance of the null hypotheses that, the model has no omitted variables as probability value (0.7441) of F-statistic for the estimated model is significant at 5% level.The ARDL cumulative summary (CUSUM) test was also conducted to test for stability of parameter. The ARDL CUSUM adopted is based on cumulative sum of the recursive residuals. This option plots the cumulative sum together with the 5% critical lines. The test finds parameter instability if the cumulative sum goes outside the area between the two critical lines. The significance of any departure from the zero line is assessed by reference to a pair of 5% significance lines, the distance between which increases with increase in the sub samples. Figures 2 show the ARDL CUSUM tests for the estimated model.

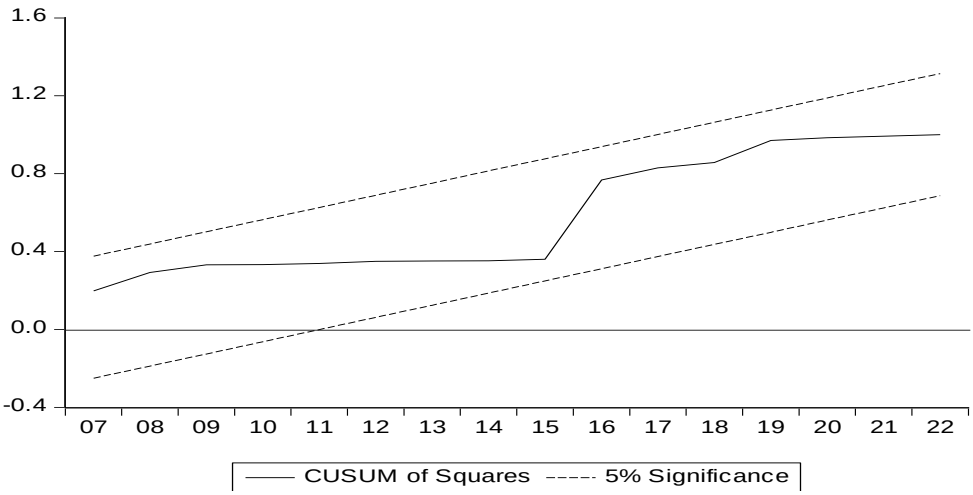

Figure 2: CUSUM Test for the Estimated Model

Source: Extracts from E-Views 9.0, 2023

The movement of repeated residuals inside the critical lines suggests coefficients stability. The cumulative sum of the repeated residuals also, shows that there is stability in the equation within the sample period.

5.0 SUMMARY CONCLUSION AND RECOMMENDATION

The study examined the connection between inflation and poverty in Nigeria from 1980-2022 using data sourced from the world development indicators 2022. The study employed the use of E-Views statistical package to analyze by testing stationary or non -stationary of the data Findings from the result showed inflation has a positive and significant relationship with poverty incidence (POVL) in Nigeria during the period under review. Also, results showed that a unit increase in inflation rate increases poverty incidence by approximately 12% in the long run within the period of the study. The research investigated the occurrence of poverty and inflation armed with the objective to find the relationship between inflation and poverty. The study sourced data from the world development indicators 20022. The study anchored on the poverty theory. It employed the use of unit root tests using the Augmented Dickey-Fuller (ADF) test to determine the stationarity of the series. Further analysis like the ARDL Optimal Lag Selection and AIC Graph Showing Optimal Model lag Selection Summary were also applied on the data collected. Analysis of the study showed that inflation is positively significant to poverty during the time period review. The study concludes that inflation is dangerous to any economy and can cause people and nations to be poor. The study also concludes that inflation and poverty occurrence are high in Nigeria. Finally, the research recommends economic measures/ policies to curb rising inflation rate in

Nigeria so as to reduce rising prices of goods and services which is a trigger to poverty. The study also, recommends economic policies that will attract foreign direct investment inflow to Nigeria.

The concludes that inflation is a trigger to poverty. Furthermore, the study recommends deliberate and proactive economic policies to curb rising inflation rates which will also, reduce poverty incidence. Finally, the study recommends economic reforms that will increase foreign direct investment inflow to Nigeria and a review of the monetary policy which will reduce interest rate thereby reducing inflation.

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