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EFFECT OF HOUSEHOLD SAVINGS ON POVERTY REDUCTION IN NIGERIA: AN AGGREGATED ANALYSIS

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Abstract

This study empirically investigate the effect of household savings on poverty reduction in Nigeria from 1999-2022 using Auto-regression Distributed Lag Model (ARDL) technique method. The objectives of the study were to examine the effect of household savings, household investment, per capital income and access to credit services on poverty reduction in Nigeria. Result revealed that the Error Correction Model (ECM) for this cointegrating relationship was negative as expected and significant which showed that about 2.5% of short run deviations would be corrected for annually. Also, from the ARDL regression result, the various tests (R2, Adjusted R2, F-statistic, and p-value) of significance on the model showed good result. The R2 of the study indicated high explanatory power of the independent variables. The adjusted R2 value of the model also supported this fact. F-statistic which measures the overall significance of the model suggests that all estimated regression model is statistically significant. Given the result of the analysis, the study recommends that: The government should be deliberate at improving the income of its citizens by improving their productivity. This is because as incomes rise, households tend to have a higher marginal propensity to save and with higher incomes there is a diminishing marginal utility to consumption. The government should building the basic infrastructure like electricity, health, transportation and communication. This can aid in boosting economic growth and per capita income. The government should set up a supervised credit scheme. This will empower people, gives them the opportunity to have an account, to save and invest, and in many cases break the chains of poverty.

1. INTRODUCTION

The word poverty depicts a general state of lack. It reflects a situation in which a person lacks the needed resources, income and material possessions to lead a good life; one in which choices and opportunities eludes a person. Poverty does not inspire and so incapacitates one from effectively

participating in community or societal affairs. It demeans one and reduces his ability to adequately function and provide the basic needs of life such as food, clothing, shelter, education and health needs of the family. Poverty also depicts living in squalor and disease, insecurity, violence, decrepit environments without access to basic amenities such as portable water, electricity, road etc (Osundina, & Osundina, 2014; Okoroafor, 2012; Obadan, & Odusola, 2021)

Poverty has been variously viewed from different standpoints in the literature. The World Bank (2018) views it from two aspects of extreme poverty and moderate poverty. While extreme poverty is defined as living on less than $1.25(PPP) per day or its equivalent depending on a nation's local currency as determined by the exchange rate, moderate poverty refers to living on less than $2 a day. Some views on poverty believe that the concept has been tainted by how people want to define the poor- as hunger stricken, diseased and sick or lacking in the abilities to read and so incapable of attending school, unable to get a job and so remain jobless etc. Thus, some definitions of poverty are born out of people's imaginations (Okoroafor, 2012; Nwankwo, 2020; Dada & Fanowopo, 2020). Poverty in Nigeria has continued to rise with its attendant effect on the economy. With low standard of living coupled with high cost of goods and services, many Nigerians are gradually falling into the poverty line. Hunger, starvation, unemployment are gradually taking a tool on the society with the crime rate (arson, kidnapping, violence, rape, terrorism etc) on the increase leading to economic backwardness of the country. Studies have revealed that statistics showed that absolute number of poor people covered in Nigeria rose from about 68.0% per 1000 persons in 2000 to 115.4% in 2020. Government's response to this ugly trend through setting up of many poverty eradication schemes has not been able to address the situation, thus, the need for more concerted effort by government (Manjoro, 2017, Adebiyi, 2012).

Household savings go a long way to determine the available funds at the disposal of a family for capital investment. Due to socio-economic variations and other demographic factors, household savings differ among countries. The literature reports that with steady savings and investment by the citizens, there is accumulation of capital formation which has contributed to the economic growth of the Nigerian economy (Enwubare & Ogbonna, 2018; Ogbokor, & Samahiya, 2014). Capital formation is seen as household savings not utilized for final consumption but invested in capital goods. The higher the investments arising from more savings, the higher the economic growth of the nation thus a nexus appears to exist among savings-capital investment-economic growth and looking at it superficially, one assumes that a rise in investment would lead to an increase in capital stock which will ultimately lead to higher growth of income and reduction in poverty (Bakare, 2011; Rohima, Suman, Manzilati, & Ashar, 2013).

Despite the importance of savings to the national economy, most Nigerians find it difficult to save and as such, there is generally low domestic savings in the nation due to low income, high cost of living, high deposit rates, high inflation, unfavorable terms of trade etc. As a result, poverty is wide spread in the country due to poor economic conditions (Enwubare & Ogbonna, 2018). Many studies have investigated household savings without much consideration for poverty as a significant factor which imparts household savings. This study therefore examines the effect of household savings on poverty reduction in Nigeria.

Statement of the Problem

With over 87 million population of Nigerians suffering from excruciating poverty, the poverty rate in the country now more than ever demands necessary attention from all and sundry. 63 years after independence, Nigeria is still struggling to alleviate poverty despite successive government's interventions aimed at economic growth and sustainability. Several of such interventions aimed at a shift from oil dependency to promoting a private sector driven economy in order to encourage domestic investments, capital formation and domestic savings, minimally achieved their objectives of boosting savings and poverty reduction. Extant literature reports that one of the determinants of a nation's level of growth and development is its capital accumulation. High interest rates, rising inflation, lack of

access to credit among other factors tend to stagnate investment thereby limiting financial assets holding by households with impacts on levels of savings (Okoroafor, 2012). Though available studies have established a link between soaring poverty and low household savings, there is still a dearth of empirical studies on this linkage. This study thus fills that gap by investigating the effects of household savings on poverty reduction in Nigeria.

Objectives of the Study

The broad objective of the study is to empirically investigate the effects of household savings on poverty reduction in Nigeria. Specifically, the study sought to determine:

1. The effect of household savings on poverty reduction in Nigeria.
2. The effect of household investment on poverty reduction in Nigeria.
3. The effect of per capital income on poverty reduction in Nigeria.
4. The effect of access to credit services on poverty reduction in Nigeria.

Research Hypotheses

The following null hypotheses guided the study;

H_{01}: Household savings has no significant effect on Poverty Reduction in Nigeria.

H_{a1}: Household savings has significant effect on Poverty Reduction in Nigeria.

H_{02}: Household investment has no significant effect on Poverty Reduction in Nigeria.

H_{a2}: Household investment has significant impact effect on Poverty Reduction in Nigeria.

H_{03}: Per capital income has no significant impact effect on Poverty Reduction in Nigeria.

H_{a3}: Per capital income has significant impact effect on Poverty Reduction in Nigeria.

H_{04}: Access to credit services has no significant effect on Poverty Reduction in Nigeria.

H_{a4}: Access to credit services has significant effect on Poverty Reduction in Nigeria.

2. METHODOLOGY

Model specification

The essence of economic modeling is to represent the phenomenon under investigation in such a way to enable the researcher to attribute numerical values to the concept. The study is modeled to incorporate household savings, household investment, per capita income and access to credit services as the explanatory variables, while poverty reduction was used as the dependent variable. Thus, the study model is specified as:

The structural form of the model is:

$$POV = f(HOS, HIN, PCI, CRD) \quad (1)$$

The mathematical form of the model is:

$$POV = \beta 0 + \beta_1 HOS + \beta_2 HIN + \beta_3 PCI + \beta_4 CRD \quad (2)$$

The econometric form of the model is:

$$POV = \beta 0 + \beta_1 HOS + \beta_2 HIN + \beta_3 PCI + \beta_4 CRD + \mu_i \quad (3)$$

Where;

POV = Poverty reduction proxied by absolute number of poor people

HOS = Household savings proxied by domestic savings

HIN = Household investment proxied by domestic investment

PCI = Per capita income proxied by GDP per capita at current PPP $, compared to US (US=100)

CRD = Access to credit services proxy by bank lending rate

f = Functional relationship

β_0 = Intercept of the model

$\beta_1 - \beta_5$ = Parameters of the regression coefficients of the model

μ = Stochastic error term.

Estimation Techniques and Procedures

The choice of which technique to be employed by researchers often follows the motivation of the study as well as the likely robustness of the analytical result. Bearing this in mind, the study applied modern econometric analytical techniques namely: Co-integration, unit root test, ARDL and error correction mechanism for the data analysis for the purpose of arriving at a dependable and unbiased analysis. The Economic views (E-views) software version 10.0 was adopted for regression analysis.

Stationarity Test (Unit Root Test)

A unit root test tests whether a time series variable is non-stationary and possesses a unit root. In order not to run a spurious regression, it is worthwhile to carry out a stationary test to make sure that all the variables have constant mean, constant variance and constant covariance. In other words, that they are stationary. The Augmented Dickey-Fuller (ADF) test would be used for this analysis since it adjusts for serial correlation.

Decision rule: If the ADF test statistic is greater than the McKinnon critical value at 5% (all in absolute term), the variable is said to be stationary. Otherwise it is non stationary.

Cointegration Test

Econometrically speaking, two variables will be co-integrated if they have a long-term, or equilibrium relationship between them. Co-integration can be thought of as a pre-test to avoid spurious regressions situations (Granger, 1986). As recommended by Gujarati (2004), the ADF test statistic will be employed on the residual.

Decision Rule: if the ADF test statistic is greater than the critical value at 5%, then the variables are co-integrated (values are checked in absolute term).

Auto-regression Distributed Lag Models (ARDL)

Auto-regression Distributed Lag Models (ARDL) model plays a vital role when comes a need to analyze an economic scenario. In an economy, change in any economic variables may bring change in another economic variable beyond the time. This change in a variable may not reflects immediately, but it distributes over future periods. Not only macroeconomic variables, other variables such as loss or profit earned by a firm in a year can affect the brand image of an organisation over the period.

Assumptions for ARDL Model

1. Absence of auto correlation is the very first requirement of ARDL. The model requires that the error terms should have no autocorrelation with each other
2. There should not occur any heteroscedasticity in the data. In simple terms, the variance and mean should remain constant throughout the model
3. The data should follow normal distribution.

4. Data should have stationary either on I(0) or I(1) or on both. In addition to this, if any of the variable in the data has stationary at l(2), ARDL Model cannot run.

Evaluation of Estimates

An evaluation of the model consists of deciding whether the estimated coefficients are theoretically meaningful and statistically satisfactory. The evaluation of this study model is based on three criteria:

1. The economic a priori criteria.
2. The statistical criteria: First order test
3. The econometric criteria: Second order test

Evaluation Based on Economic A Priori Criteria

This could be carried out to show whether each regressor in the model is comparable with the postulations of economic theory; that is, if the sign and size of the parameters of the economic relationships follow with the expectation of the economic theory. The a priori expectations, in tandem with the effect of household savings on poverty reduction in Nigeria are presented in Table 1 below:

Table 1: **Summary of the Apriori expectation**

Parameters	Variables		Expected Relationships	Expected Coefficients
	Regressand	Regressor		
β_0	POV	Intercept	+/-	$0 < \beta_0 > 0$
β_1	POV	HOS	+	$\beta_1 > 0$
β_2	POV	HIN	+	$\beta_2 > 0$
β_3	POV	PCI	+	$\beta_3 > 0$
β_4	POV	CRD	+	$\beta_4 > 0$

Source: Researcher's compilation (2023)

A positive '+' sign indicate that the relationship between the regressor and regressand is direct and move in the same direction that is, increase or decrease together. On the other hand, a '-' shows that there is an indirect (inverse) relationship between the regressor and regressand that is, they move in opposite or different direction.

Evaluation Based on Statistical Criteria: First Order Test

This aims at the evaluation of the statistical reliability of the estimated parameters of the model. In this case, the F-statistic, Co-efficient of determination (R^2) and the Adjusted R^2 are used.

The square of the coefficient of determination R^2 or the measure of goodness of fit is used to judge the explanatory power of the explanatory variables on the dependent variables. The R^2 denotes the percentage of variations in the dependent variable accounted for by the variations in the independent variables. Thus, the higher the R^2, the more the model is able to explain the changes in the dependent variable.

However, if R^2 equals one, it implies that there is 100% explanation of the variation in the dependent variable by the independent variable and this indicates a perfect fit of regression line. While where R^2 equals zero. It indicates that the explanatory variables could not explain any of the changes in the dependent variable. Therefore, the higher and closer the R^2 is to 1, the better the model fits the data. Note that the above explanation goes for the adjusted R^2.

F-test: The f-statistic is a measure of the overall significance of the estimated regression. It is used to compare two population variances. Thus, in verifying the overall significance of the estimated model, the hypothesis tested is:

H_0: The model has no goodness of fit

H_1: The model has a goodness of fit

Decision rule: Reject H_0 if $F_{cal} > F_{\alpha}$ (k-1, n-k) at $\alpha = 5\%$, accept if otherwise.

Evaluation Based on Econometric Criteria: Second Order Test

This aims at investigating whether the assumption of the econometric method employed are satisfied or not. It determines the reliability of the statistical criteria and establishes whether the estimates have the desirable properties of unbiasedness and consistency. In this case, Autocorrelation, Multicolinearity and Heteroscedasticity will be tested.

Test for Autocorrelation

Autocorrelation can be regarded as "correlation between members of series of observations ordered in time (as in time series data) or space (as in cross-sectional data)". This test is carried out to see if the error or disturbance term (μ_t) is temporarily independent. It tests the validity of non autocorrelation disturbance. The Durbin-Watson (DW) test is appropriate for the test of First-order autocorrelation and it has the following decision criteria.

1. If d* is approximately equal to 2 (d* =2), we accept that there is no autocorrelation in the function.
2. If d*= 0, there exist perfect positive auto-correlation. In this case, if 0<d*< 2, that is, if d* is less than two but greater than zero, it denotes that there is some degree of positive autocorrelation, which is stronger the closer d* is to zero.
3. If d* is equal to 4 (d*=4), there exist a perfect negative autocorrelation, while if d* is less than four but greater than two (2<d*< 4), it means that there exist some degree of negative autocorrelation, which is stronger the higher the value of d*.

Test for Multicolinearity

Multicolinearity means the existence of a "perfect," or exact, linear relationship among some or all explanatory variable of a regression model. It is used to determine whether there is a correlation among variables.

Decision Rule: From the rule of Thumb, if correlation coefficient is greater than 0.8, we conclude that there is multicolinearity but if the coefficient is less than 0.8 there is no multicolinearity. Also, reject the null hypothesis (H_0), if any two variables in the model are in excess of 0.8 or even up to 0.8. Otherwise we reject.

Test for Heteroscedasticity

The essence of this test is to see whether the error variance of each observation is constant or not. Non-constant variance can cause the estimated model to yield a biased result. White's General Heteroscedasticity test would be adopted for this purpose.

Decision Rule: Accept the null hypothesis that there is a homoscedasticity (i.e. no heteroscedasticity) in the residuals if the probability of the calculated test statistic (X^2 or F) is greater than the 0.05 level of significance chosen in the study, the null hypothesis will be accepted.

Test for Research Hypotheses

This study will test the research hypothesis using t-test. The t-statistics test tells us if there is an existence of any significance relationship between the dependent variable and the explanatory variables. The t-test will be conducted at 0.05 or 5% level of significance.

Decision rule: Reject H_0 if $t_{cal} > t_{\alpha/2}$, (n-k). Otherwise, we accept.

Nature and Source of Data

Data collected and used for this study are annual time series spanning from 1988-2020. These data were

sourced from the World Development Indicators (WDI), 2020 edition and the Central Bank of Nigeria (CBN) Statistical Bulletin (2020).

3. DATA PRESENTATIONS AND ANALYSES

Stationary Unit Root Test

Establishing stationarity is essential because if there is no stationarity, the processing of the data may produce biased result. The consequences are unreliable interpretation and conclusions. The study test for stationarity using Augmented Dickey-Fuller (ADF) tests on the data. The ADF tests are done on level series, first and second order differenced series. The decision rule is to reject null hypothesis if the ADF statistic value exceeds the critical value at a chosen level of significance (in absolute terms). The result of regression is presented in Table 2 below.

Table 2: Summary of ADF Unit Root Test Results

	Level = *I*(0)		**1st Difference = *I*(1)**	
Variables	**No Trend**	**With Trend & Intercept**	**No Trend**	**With Trend & Intercept**
POV	1.536722	-1.604051	-4.645478	-5.445740
HOS	-0.910672	-2.264705	-7.921031	-7.781298
HIN	-0.770608	-2.313523	-4.767174	-5.403793
PCI	-1.522811	1.780013	-4.564782	-5.971060
CRD	-0.438640	-2.573154	-10.34210	-10.34210
@1%	-2.639210	-4.273277	-2.641672	-4.284580
@5%	-1.951687	-3.557759	-1.952066	-3.562882
@10%	-1.610579	-3.212361	-1.610400	-3.215267

Source: Researcher's computation (2023) using E-view 10.0

Evidence from unit root table above shows that all the study or model variables are not stationary at level difference but stationary at first difference. Since the decision rule is to reject null hypothesis if the ADF statistic value exceeds the critical value at a chosen level of significance (in absolute terms), and accept stationarity when ADF statistics is greater than criteria value, the ADF absolute value of each of these variables is greater than the 1%, 5% and 10% critical value at their first difference but less than 5% critical value in their level form (see appendixes 2-6). Therefore, the study concludes that poverty reduction (POV), household savings (HOS), household investment (HIN), per capita income (PCI) and access to credit services (CRD) are all stationary at their first difference integration *I*(1).

Cointegration Test

The aim of cointegration test is to determine if some set of non-stationary time series variables have long run equilibrium relationship or not. Thus, when cointegration is established, regression can be proceed without generating spurious results. For cointegration test, the study used the ARDL bound testing approach and the results are reported in Table 3 below:

Table 3: ARDL Bound Test Results

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	15.45484	10%	2.2	3.09
k	4	5%	2.56	3.49
		2.5%	2.88	3.87
		1%	3.29	4.37

Source: Researcher's computation (2023) using E-view 10.0

From Table 3, the value of the F-statistic which shows the joint significance of the level variables is 15.45484 and is significantly greater than the upper bound (*I*(1)), at the 1% level of significance. Therefore, the study concludes that there exists a long run relationship between poverty reduction and the explanatory variables of the study. Thus, the study can estimate the long run coefficients based on ARDL model.

Estimated Long run Coefficients

Having verified the existence of long run relationship among the study model, the study therefore subjects the model to Auto-regression Distributed Lag Models (ARDL) to generate the coefficients of the parameters of the regression model.

Table 4: Long run Coefficients

ARDL Long Run Form and Bounds Test
Dependent Variable: D(POV)

Conditional Error Correction Regression				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
HOS	3.004591	2.573753	1.167397	0.2767
HIN	2.347923	0.350723	6.694517	0.0002
PCI	5.704501	1.864770	3.059090	0.0156
CRD	2.811391	3.024523	2.929532	0.0198
C	24.59174	42.65284	5.765558	0.0004

Source: Researcher's computation (2023) using E-view 10.0

From the Table 4 above, the long run coefficients of household savings (3.00), household investment (2.35), per capita income (5.7), and access to credit (2.81) show that the various variables have a positive significant relationship with poverty reduction in Nigeria in long run. Since, the variables exhibit a long run relationship, the study goes further to establish the short run relationship.

Error Correction Regression

Table 5 Summary of Error Correction Regression

ARDL Error Correction Regression
Dependent Variable: D(POV)
Sample: 1999 2022
Included observations: 24

ECM Regression Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(POV(-1))	-2.346787	0.137508	-2.521937	0.0357
D(HOS)	0.294334	0.118456	2.484744	0.0378
D(HIN)	0.883757	0.203431	4.344263	0.0025
D(PCI)	1.603907	2.630672	3.609695	0.0090
D(CRD)	0.253589	0.175579	1.444299	0.1867
CointEq(-1)*	-2.499849	0.086658	-5.768037	0.0004
R-squared	0.886337			
Adjusted R-squared	0.755187			
F-statistic	15.45484			
Durbin-Watson stat	1.800329			

Source: Researcher's computation (2023) using E-view 10.0

To discuss the regression results as presented in Table 5, the study employ economic a priori criteria, statistical criteria and econometric criteria.

Economic A Priori Criteria

This subsection is concerned with evaluating the regression results based on a priori (that is, theoretical) expectations. The sign and magnitude of each variable coefficient is evaluated against theoretical expectations.

From table 5, it is observed that the regression line have a positive intercept as presented by the constant (c) = -2.346787. This means that if all the variables are held constant or fixed (zero), poverty reduction will be valued at 2.35 absolute numbers of poor people. Thus, the a-priori expectation is that the intercept could be positive or negative, so it conforms to the theoretical expectation.

From table 5, the study showed that household savings, household investment, per capita income and access to credit services have shown to exhibit a positive impact on poverty reduction in Nigeria. Thus, increase in household savings, household investment, per capita income and access to credit services will reduce poverty in Nigeria and vice versa.

From the regression analysis, it is observed that all the variables conform to the a priori expectation of the study. Thus, Table 6 summarises the a priori test of this study.

Table 6: Summary of Economic A Priori Test

Parameters	Variables		Expected Relationships	Observed Relationships	Conclusion
	Regressand	Regressor			
β_0	POV	Intercept	+/-	-	Conform
β_1	POV	HOS	+	+	Conform
β_2	POV	HIN	+	+	Conform
β_3	POV	PCI	+	+	Conform
β_4	POV	CRD	+	+	Conform

Source: Researcher's computation (2023) using E-view 10.0

Statistical Criteria

This subsection applies the R^2, adjusted R^2 and the F–test to determine the statistical reliability of the estimated parameters. These tests are performed as follows:

From the study regression result, Table 6 indicated that the coefficient of determination (R^2) is given as 0.886337, which shows that the explanatory power of the variables is extremely high and very strong. This implies that 87% of the variations in the poverty reduction are being accounted for or explained by the variations in household savings, household investment, per capita income and access to credit services in Nigeria. While other possible determinants of poverty reduction not captured in the model explain about 13% of the variation in poverty reduction in Nigeria.

The adjusted R^2 in Table 5 supports the claim of the R^2 with a value of 0.755187indicating that 76% of the total variation in the dependent variable (poverty reduction) is explained by the independent variables (the regressors)). Thus, this supports the statement that the explanatory power of the variables is extreme high and very strong.

The F-statistic: The F-test is applied to check the overall significance of the model. The F-statistic is instrumental in verifying the overall significance of an estimated model. The hypothesis tested is:

H_0: The model has no goodness of fit

H_1: The model has a goodness of fit

Decision rule: Reject H_0 if $F_{cal} > F_{\alpha}$ (k-1, n-k) at $\alpha = 5\%$, accept if otherwise.

Where

V_1 / V_2 Degree of freedom (d.f)

V_1 = n-k, V_2 = k-1:

Where; n (number of observation); k (number of parameters)

Where k-1 = 5-1= 4

Thus, n-k = 29-5 = 24

Therefore: $F_{0.05(4,24)}$ = 2.78 (From F-table) … … F-table

F-statistic = 15.45484 (From Regression Result) … F-calculated

Therefore, since the F-calculated > F-table as observed in Table 4.6, the study reject H_0 and accept H_1 that the model has goodness of fit and is statistically different from zero. In other words, there is significant impact between the dependent and independent variables of the study.

Econometric Criteria

In this subsection, the following econometric tests are used to evaluate the result obtained from the study model; autocorrelation, multicollinearity and heteroscedasticity.

Test for Autocorrelation

Using Durbin-Watson (DW) statistics which the study obtains from the regression result in table 6, it is observed that DW statistic is 1.800329 or approximately 2. This implies that there is no autocorrelation since d* is approximately equal to two. 1.800329tends towards two more than it tends towards zero. Therefore, the variables in the models are not autocorrelated and that the models are reliable for predications.

Test for Multicollinearity

This means the existence of a "perfect," or exact, linear relationship among some or all explanatory variable of a regression model. This will be used to check if collinearity exists among the explanatory variables. The basis for this test is the correlation matrix obtained using the series. The result is presented in Table 7 below.

Table 7: Summary of Multicollinearity Test

Variables	Correlation Coefficients	Conclusion
HOS and HIN	0.665453	No multicollinearity
HOS and PCI	-0.681997	No multicollinearity
HOS and CRD	0.333893	No multicollinearity
HIN and PCI	-0.666869	No multicollinearity
HIN and CRD	0.537705	No multicollinearity
PCI and CRD	-0.485180	No multicollinearity

Source: Researcher's computation (2023) using E-view 10.0

Decision Rule: From the rule of Thumb, if correlation coefficient is greater than 0.8, the study conclude that there is multicollinearity but if the coefficient is less than 0.8 there is no multicollinearity. The study therefore, concluded that the explanatory variables are not perfectly linearly correlated.

Test for Heteroscedasticity

This test is conducted to see whether the error variance of each observation is constant or not. The hypothesis testing is thus:

H_0: There is a homoscedasticity in the residuals

H_1: There is a heteroscedasticity in the residuals

The decision rule if is to Accept the null hypothesis that there is a homoscedasticity (i.e. no heteroscedasticity) in the residuals if the probability of the calculated F-test statistic (F) is greater than the 0.05 level of significance chosen in the study, the null hypothesis will be accepted. Hence, *P*(F) = 0.1660. This means that the probability F statistic is greater than 0.05 level of significance. Therefore, the study accepted the null hypothesis that the model has no heteroscedasticity in the residuals and therefore, the data is reliable for predication.

Evaluation of Research Hypotheses

The t-test is used to know the statistical significance of the individual parameters. Two-tailed tests at 5% significance level are conducted. The result is shown on Table 8 below. Here, the study compare the estimated or calculated t-statistic with the tabulated t-statistic at $t_{\alpha/2} = t_{0.05} = t_{0.025}$ (two-tailed test).

Degree of freedom (df) = n-k = 29-5 = 24

So, the study has:

$T_{0.025(24)} = 2.064$ … … … Tabulated t-statistic

In testing the working hypotheses, which partly satisfies the objectives of this study, the study employs a 0.05 level of significance. In so doing, the study is to reject the null hypothesis if the t-value is significant at the chosen level of significance; otherwise, the null hypothesis will be accepted. This is summarized in table 8 below.

Table 8: Summary of t-statistic

Variable	t-calculated (t_{cal})	t-tabulated ($t_{\alpha/2}$)	Conclusion
Constant	-2.521937	2.064	Statistically Significant
HOS	2.484744	2.064	Statistically Significant
HIN	4.344263	2.064	Statistically Significant
PCI	3.609695	2.064	Statistically Significant
CRD	1.444299	2.064	Statistically Significant

Source: Researcher's computation (2023) using E-view 10.0

Decision Rule

1. If calculated t-value > tabulated t-value, we reject the null hypothesis and accept the alternative hypothesis.
2. If calculated t-value < tabulated t-value, we accept the null hypothesis and reject the alternative hypothesis

The study begins by bringing the working hypothesis to focus in considering the individual hypothesis.

Hypothesis One

H_0: Household savings has no significant impact on poverty reduction.

H_1: Household savings has significant impact on poverty reduction.

Decision:

Applying the above decision rule to the first hypothesis, it showed that the calculated absolute t-value of 2.484744 is greater than tabulated absolute t-value of 2.064 which result to rejecting the null hypothesis that household savings has no significant impact on poverty reduction and accepting the alternative hypothesis that household savings has significant impact on poverty reduction in Nigeria.

Hypothesis Two

H_0: Household investment has no significant impact on poverty reduction.

H_1: Household investment has significant impact on poverty reduction.

Decision:

Applying the above decision rule to the forth hypothesis, it indicated that the calculated absolute t-value of 4.344263 is greater than tabulated absolute t-value of 2.064 which result to rejecting the null hypothesis that household investment has no significant impact on poverty reduction and accepting the alternative hypothesis that household investment has significant impact on poverty reduction in Nigeria.

Hypothesis Three

H_0: Per capita income has no significant impact on poverty reduction.

H_1: Per capita income has significant impact on poverty reduction.

Decision:

Applying the above decision rule to the third hypothesis, it indicated that the calculated absolute t-value of 3.609695 is greater than tabulated absolute t-value of 2.064 which result to rejecting the null hypothesis per capita income has no significant impact on poverty reduction and accepting the alternative hypothesis that per capita income has significant impact on poverty reduction in Nigeria.

Hypothesis Four

H_0: Access to credit service has no significant impact on poverty reduction.

H_1: Access to credit service has a significant impact on poverty reduction.

Decision:

Applying the above decision rule to the second hypothesis, it showed that the calculated absolute t-value of 1.444299 is less than tabulated absolute t-value of 2.064 which result to accepting the null hypothesis that access to credit service has no significant impact on poverty reduction in Nigeria.

4. CONCLUSION AND RECOMMENDATIONS

The study empirically investigate the effects of household savings on poverty reduction in Nigeria from 1999-2022 using Auto-regression Distributed Lag Model (ARDL) technique method. All data used are secondary data obtained from the Statistical Bulletin of Central Bank of Nigeria (CBN) and National Bureau of Statistics (NBS) annual publications. The objectives of the study were to examine the effect of household savings on poverty reduction in Nigeria; determine the effect of household investment on poverty reduction in Nigeria; ascertain the effect of per capital income on poverty reduction in Nigeria; and to examine the effect of access to credit services on poverty reduction in Nigeria. The study data were analyzed and results presented with the help of E-views software version 10.0. Auto-regression Distributed Lag Model (ARDL) results of the model were presented and the parameter estimates subjected to some economic a priori, statistical and econometric tests.

In executing the study, the ARDL technique was applied after determining stationarity of the variables using the ADF Statistic and was discovered that the variables are stationary in their first difference. The study using ARDL Bounds Test, finding that there is a long run and short run relationship between economic growth and the variables used in the study. Hence, the implication of this result is that there is a long run relationship between poverty reduction and other variables used in the model.

From the result of the ARDL, the study revealed that household savings has a positive and significant relationship with poverty reduction in short run but positive and insignificant relationship with poverty reduction in long run in Nigeria. Also, household investment and per capita income is positively and

significantly related to poverty reduction in the short run and long run in Nigeria. On the other hands, access to credit service has a positive and insignificant relationship with poverty reduction in short run but positive and significant relationship with poverty reduction in long run in Nigeria.

The Error Correction Model (ECM) for this cointegrating relationship was negative as expected and significant which showed that about 2.5% of short run deviations would be corrected for annually. Also, from the ARDL regression result, the various tests (R^2, Adjusted R^2, F-statistic, and p-value) of significance on the model showed good result. The R^2 of the study indicated high explanatory power of the independent variables. The adjusted R^2 value of the model also supported this fact. F-statistic which measures the overall significance of the model suggests that all estimated regression model is statistically significant.

Finally, in the long run, if all the variables are hold constant or fixed, absolute number of poor people or poverty reduction will be valued at 24.59. Thus, poverty or absolute number of poor people will reduce by 25% while in the short run, it accounts at 2.5, meaning that poverty or absolute number of poor people will reduce by 3% in the short run in Nigeria.

Given the result of the analysis therefore, the following are recommended: The government should be deliberate at improving the income of its citizens by improving their productivity. This is because as incomes rise, households tend to have a higher marginal propensity to save and with higher incomes there is a diminishing marginal utility to consumption. The government should building the basic infrastructure like electricity, health, transportation and communication. This can aid in boosting economic growth and per capita income. The government should set up a supervised credit scheme. This will empower people, gives them the opportunity to have an account, to save and invest, and in many cases break the chains of poverty.

REFERENCES

1. Adebiyi, M. A. (2012). The role of real interest rates and savings in Nigeria: First Bank of Nigeria Plc. Quarterly Review, 23(1), 45-52. .
2. Bakare, A. S. (2011). Does economic growth reduce poverty in Nigeria? *Journal of Developing Country Studies* 3(4), 62–68.
3. Dada, J. T., & Fanowopo, O. (2020). Economic growth and poverty reduction in Nigeria: The role of institutions. *Ilorin Journal of Economic Policy, 7*(1), 1-15.
4. Enwubare, A. N. & Ogbonna, S. J. (2018). Impact of savings and investment in poverty reduction in Nigeria. *Journal of Social Sciences, 12*(8), 307-316.
5. Gafar (2011)
6. Granger, C.W.J. (1986) Developments in the study of co-integrated economic variables. *Oxford Bulletin of Economics and Statistics*, 48, 213-227.
7. Gujarati, D.N. (2004) *Basic Eeconometrics*. 4th Edition, McGraw-Hill Companies.
8. Manjoro, S. N. (2017). An empirical study on the nexus of poverty, GDP growth, dependency ratio and employment in developing countries. *Journal of Competitiveness, 5*(2), 67–82
9. Nwankwo, A. S. (2020). Relationship between savings and poverty reduction in Nigeria. *European Journal of Business, Economics and Accountancy, 6*(4), 30-44.
10. Obadan, A., & Odusola, C. (2021). Impact of household savings on poverty reduction in Nigeria: ARDL model approach. *International Journal of Academic Research in Economics and Management Sciences, 4*(1), 211-223.
11. Ogbokor, S. R. & Samahiya, M. G. (2014). Explaining inequality and welfare status of households in Nigeria. *Human Social science Journal, 3*(1), 70–80

12. Okoroafor, A. (2012). Determinants of poverty reduction in Nigeria. *CBN Economic and Financial Review*, 39(4), 45–71.
13. Osundina, N. & Osundina, S. (2014). Unemployment and poverty in Nigeria: A link to national insecurity. *Global Journal of Politics and Law Research*, 12(1), 19–35
14. Rohima, S., Suman, N., Manzilati, A. & Ashar, S. (2013). Household participation in formal and informal savings mechanisms: Evidence from Pakistan. *Review of Development Economics, 6*(3), 314-328.
15. World Bank, (2014), *Poverty and inequality database*, World Bank, Washington, DC