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IMPACT OF ENERGY CONSUMPTION ON ECONOMIC GROWTH IN NIGERIA: AN AUTOREGRESSIVE DISTRIBUTED LAG (ARDL) APPROACH

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Abstract

This study was designed to analyze the relationship between energy consumption and economic growth in Nigeria using annual time series data from 1981 to 2019. The energy sources used to test for this relationship were oil and electricity consumption. The methodology used in the study is ARDL Approach to Cointegration. Starting with the test for stationarity (ADF and PP), the result revealed that all the variables (real GDP, oil consumption and electricity consumption) have a unit root at level, but become stationary at first difference, thus implying I(1) series. The finding of the research further shows that, there is a stable long run relationship between real GDP, oil consumption and electricity consumption, thus, indication a causal relationship in at least one direction. The estimated long run model indicates that oil consumption is a significant positive determinant of economic growth. However, electricity consumption is a negative insignificant determinant. In the short run, the coefficient of the error correction term is -0.0637 suggesting about 6.37 percent annual adjustment towards long run equilibrium. The study further recommends that huge investment is needed and should be encouraged to both local and foreign investors in the energy generating sector of the Nigerian economy.

Key words: ARDL, Oil, Electricity, Economic Growth, Energy, Consumption.

JEL Classification: C5; Q4

1.1 Introduction

Energy has been identified as an important input in the production process that some authors have advocated its inclusion in the production function alongside other factors such as land, labour and capital (Alam, Begum, Buysse, & Huylenbroeck, 2012), while some other authors see energy as the factor enhancing the productivity of other factors of production (Cheng & Lai, 1997).

Energy sector development is essential for economic development, and improved quality of energy services are expected to increase economic productivity (Toman & Jemelkova, 2003). Similarly, attaining economic growth, will lead to the consumption of more energy resources; as such oil, electricity, etc. Both issues have policy implications in the developed and developing nations.

Energy is an indispensable input in the production processes; its increased consumption may stimulate overall increase in GDP (OECD, 2011). Continues access to modern energy resources like electricity and oil (petroleum product and natural gas) are essential ingredient for development process and have proven to be a contentious issue thereby suggesting that modern energy generation and its accessibility is an important factor in the process of development in Nigeria.

Therefore, the successful development of the energy sector will be a crucial factor in determining the pace of economic and social development in Nigeria. Understanding the directions in which Nigeria's energy sector is set to develop is essential for policymakers and investors. If the picture which emerges is unacceptable, action can be taken to change it (Dutsin-ma, 2019).

Nigeria's energy sector is vital to its development and yet it is one of the most poorly understood parts of the global energy system. Nigeria in recent times has experienced more rapid economic growth than in the past, raising expectations of a new phase of development (IEA, 2011). This led to an increasing need for energy driven by rapid population growth, unplanned urban growth, growth in GDP as a result of industrial growth as well as growth in the use of automobiles. Policy makers in Nigeria need to take into account the growing need of energy in the country so as to match the increasing demand with the slow supply of energy in the country (Oyedope, 2012).

As one of the drivers of energy consumption, for instance, it is expected that the number of commercial vehicles and buses would grow from around 8 million vehicles in 2012 to 25 million in 2040. East Africa leads the way with average growth of nearly 5% per year, driven by a rapidly growing population and demand from the services and industry sectors. Mozambique and Tanzania see average growth of more than 4% per year (Africa Energy Outlook, 2014).

Africa Energy Outlook(2014) further reports that, increase in per capita income in most of the African countries as a result of increase in GDP also brings about increases in the demand for energy as most of the households are changing their standard of living. Modern electrical appliances are substituting locally made materials. As the income of a household increases so also his standard of living which is concomitant with the energy demands.

It is glaring from the foregoing that sustainable economic growth needs sustainable supply of energy resources and an effective and efficient utilization of the energy resources. Hence, the design of this study to investigate the long-run relationship and causality between energy and economic growth in Nigeria. However, the study adds value by employing electricity and oil consumption to represent energy, and applying ARDL bound testing to study energy in the Nigerian economy. The research is organized such that section one is the introduction, two is the literature review, section three is the methodology, section four the result and discussion, and section five presents conclusion and recommendations.

2.1 Literature Review

2.2 Conceptual Literature

Energy Consumption is the utilization of energy resources for economic activities. It encompasses the amount of energy or power used by individuals, companies or countries at large. In other words, it is the amount of energy consumed in a process or system, or by an organization or society (Africa Energy Outlook, 2019)

Economic Growth refers to the process by which national income or output is increased over a period of time. It is a sustained increase in the actual output of goods and services per head. However, economic growth can follow many different paths, and not all of them are sustainable. Indeed, there are many who argue that given the finite nature of the planet and its resources, any form of economic growth is ultimately unsustainable (Akinlo, 2009).

Economists usually measure economic growth in terms of Gross Domestic Product (GDP) or related indicators, such as Gross National Product (GNP) or Gross National Income (GNI) which is derived from the GDP calculation. GDP is calculated from a country's national account which reports annual data on income, expenditure and investment for each sector of the economy (Todaro, 1977).

2.3 Theoretical Literature

The Mainstream Theory of Growth can take this form: models without resources;those with resources and no technical change and the models with resources andtechnical change. The core mainstream growth models (Aghion & Howitt, 2009) do not include resources or energy. Early growth models, such as that of Solow (1956), did not explain how improvements in technology come about, such that these models are said to have exogenous technological change. More recent models attempt to indigenize technological change by explaining technological progress as the outcome of decisions taken by firms and individuals.

The early endogenous growth models such as Arrow's (1962) learning by doing model or Hicks'(1932) induced innovation model allowed the state of technology to respond to changes in one of the variables in the model but do not explicitly model an optimizing process. The more recent endogenous growth models popularly known as AK models mostly do not explicitly model research and development activities (R&D). In AK models, the relationship between capital and output can be written in this form, $Y = AK$, where A is a constant and K is a composite of manufactured capital and disembodied technological knowledge thought of as a form of capital. Saving is directed to either manufactured capital accumulation or the increase of knowledge. The growth rate is permanently influenced by the savings rate; a higher savings rate increases the economy's growth rate, not merely its equilibrium level of income.

Lastly, in the mainstream growth models with resources and technical change, in addition to substitution of capital for resources, technological change might permit growth or at least constant consumption in the face of a finite resource base. When the elasticity of substitution between capital and resources is unity, exogenous technical progress will allow consumption to grow over time if the rate of technological change divided by the discount rate is greater than the output elasticity of resources. Technological change might enable sustainability even with an elasticity of substitution of less than one. Once again, technical feasibility does not guarantee sustainability. Depending on preferences for current versus future consumption, technological change might instead result in faster depletion of the resource.

2.4 Empirical Literature

Energy is indispensable in human societies. Humans use energy to transform man-made capital and natural capital into goods and services, which represent financial value. For over two centuries cheap fossil fuel energy has been used to produce financial capital and to maintain it. Nowadays the world consumes more energy than ever before in human history.

Chinedu, Daniel, and Ezekwe (2019) examined the impact of energy consumption on economic growth over a period of 1980 to 2017. The empirical result shows that the coefficients of petroleum oil and Liquified natural gas (GAS) have positive significant effect on Real Gross Domestic Product (RGDP), more so, electricity (ELECT) has positive insignificant effect on Real Gross Domestic Product (RGDP). In another development, Isik and Shahbaz (2015) conduct their study on the relationship between energy consumption and economic growth in OECD countries spanning the period 1980-2010. Panel data methods were used to analyze the causal relationship between and growth. The outcomes of the study reveal that there is a significant relationship between energy consumption and economic growth in OECD countries.

Similarly, Omri (2013) examines the nexus between CO2 emissions, energy consumption and economic growth using simultaneous-equations models with panel data of 14 MENA countries over the period 1990–2011. The empirical results show that there exists a bidirectional causal relationship between energy consumption and economic growth. However, the results support the occurrence of unidirectional causality from energy consumption to CO2 emissions without any feedback effects, and there exists a bidirectional causal relationship between economic growth and CO2 emissions for the region as a whole.

Moreover, Saidi and Hammami (2013) in their work, examine the two-way linkages between energy consumption and economic growth using data from Tunisia over the period 1974-2011. The study tests the interrelationship between the variables using the Johansen cointegration technique. The empirical results show that there exists a bidirectional causal relationship between energy consumption and economic growth in the long-run.

Saatci and Dumrul (2013) conduct empirical investigation of the role of energy consumption in economic growth for the Turkish economy. The data used include annual energy consumption and economic growth series from 1960 to 2008. Aggregate as well as various disaggregate data on energy consumption, including oil, electricity, coal and renewable energy were used. The researcher employs structural breaks modeling approach. The main conclusion of the study was that Turkey’s energy consumption and economic growth have a positive relationship with varying quantity with structural breaks.

Chaudry, Safdar and Farook (2012) investigates the relationship between energy consumption and economic growth in Pakistan based on annual data for the period of 1972-2012. The empirical results show that the consumption of electricity significantly stimulates economic growth among other sources of energy, while oil consumption also affects economic growth adversely because of its high volume of import.

Shahbaz and Feridun(2011)use Autoregressive Distributed Lag (ARDL) bounds testing procedure to identify the long run equilibrium relationship between electricity consumption and economic growth in Pakistan spanning the period 1971 and 2008. Toda Yamamoto and Wald-test causality tests have identified the direction of the causal relationship between these two variables. Ng-Perron and Clement-Montanes-Reyes unit root tests are used to handle the problem of integrating orders for variables. The results suggest that the two variables are in a long run equilibrium relationship and economic growth leads to electricity consumption and not vice versa.

Boopen and Vinesh (2011) analyses the relationship between GDP and carbon dioxide emissions in Mauritius and vice-versa in a historical perspective using rigorous econometrics analysis, their results suggest that carbon dioxide emission trajectory is closely related to the GDP time path. The result shows that emissions elasticity on income has been increasing over time. By estimating the EKC for the period 1975-2009, the result was unable to prove the existence of a reasonable turning point and thus no EKC “U” shape was obtained.

Shuyun and Donghu (2011), examine the causality between GDP and energy consumption by using updated

China provincial panel data for the period 1985–2007 within a multivariate framework by adopting Pedroni's panel methodology. The results show that cointegration exists between real GDP, energy consumption, the labor force, and real gross fixed capital. The results of Granger-causality test indicate the presence of Bi-directional causality between energy consumption and economic growth which supports the feedback hypothesis. The study was conducted in one country under provinces; while this study use panel data of oil producing countries in Africa for the period of 1999-2016

3. Methodology

3.1 Data Description

The focus of this study is to estimate the short and long run relationship of energy consumption and economic growth in Nigeria using Autoregressive Distributed Lag Model (ARDL). All data series are annual time series over 39 years spanning the period 1981 to 2019. Secondary sources of data are explored in extracting useful information for the research study. Given the peculiar problem of obtaining data in Nigeria, data only from the World Bank's World Development Indicators (WDI) database, 2021 which is a more reliable source are used.

3.2 Model Specification

Following the established practice in literature and theoretical postulations, in evaluating the relationship existing between energy consumption and economic growth in Nigeria, a model constituting the aforementioned macroeconomic variables is developed in order to estimate the long run and short run relationship between the variables.

The nature and magnitude of the relationship can be expressed in mathematical functional relation form as:

$$RGDP = f(OC, ELC)\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 1$$

To make equation *1* fit for computation, we present it in econometric form below:

$$RGDP = \alpha_0 + \alpha_1 OC + \alpha_2 ELC + \mu\ldots\ldots\ldots\ldots\ldots\ldots\ldots..2$$

Where;
RGDP = Real Gross domestic product
OC = Oil consumption
ELC = Electricity consumption
α_0 is the constant term, while α_1 and α_2 are the coefficient of *OC, and ELC* respectively.

To be able to standardize all the variables (regressand and regressors alike) and interpret the resulting partial slope coefficients as elasticities and to measure growth, the model is re-specified by taking its natural logarithm as follows:

$$lnRGDP = \alpha_0 + \alpha_1 lnOC + \alpha_2 lnELC + \mu \ldots\ldots\ldots\ldots\ldots\ldots..3$$

Where
ln stands for the natural logarithm of the variables

3.3 Method of Data Analysis

Econometric method of time series analysis (e-views 10.0) is employed as a technique to evaluate the relationship between energy and economic growth captured by the model, given that it provides quantitative estimation of relationship among variables without much subjective judgment.

The estimation starts with a unit root test to confirm the stationarity state of the variables used to build the model. In order to test for the stationarity, Augmented Dickey Fuller (ADF) and the Phillips-Perron (PP) test are used. The first step is to test for stationarity at level, as appropriate (constant and trend or none), if the variables are found not stationary at level, then the next step is to differenced and re-test. If the variables are stationary after the first differencing, then the variables are integrated of order one I(1), and this is a condition to employ the Autoregressive Distributed Lag approach to Cointegration. It is more appropriate considering the sample size so as to estimate if there exists any long run relationship between the variables. And also, to obtain the parsimonious short run dynamic model of the series after co-integrating, Error Correction Mechanism is employed to better capture the dynamics of the relationships. Moreover, appropriate diagnostic test are conducted to ensure the model is good for forecast and policy making.

3.4 Autoregressive Distributed Lag Approach to Cointegration

Autoregressive Distributed Lag (ARDL) approach to cointegration is a model proposed by Pesaran and Shin (1997, 1999), and Pesaran, Shin, and Smith (2001)developed the bounds testing procedure to test the existence of any long run and short run relationship between endogenous variable and its determinants, when the differenced stationary exist among the regressors. Hence, this approach is applicable irrespective of whether the variables are purely I(1), or a combination with I(0).

The Wald or F-statistic statistic is an underlying value to the bounds testing procedure usually used to test the significance of lagged levels of the variables under consideration in a conditional unrestricted equilibrium correction model. In the ARDL framework, two sets of critical values were provided for the two polar cases (Pesaran and Pesaran, 1997).
The approach is carried out by developing hypothesis as follow:

H_0: $\alpha_1 = \alpha_2 = 0$ (that is No cointegration)
H_1: $\alpha_1 \neq \alpha_2 \neq 0$ (Presence of cointegration)

The rule explains that if the computed F-statistic is below the lower critical bound (I (0)), the null hypothesis of no cointegration cannot be rejected. However, if it falls above the upper boundary (I (1)), the null hypothesis is to be rejected and the evidence of cointegration is found in the relationship, thus validating the presence of a long-run relationship between the endogenous variable and its determinants. Nevertheless, if the computed F-statistic falls in between the two values, evidence of inconclusive and integration properties of the variables may be checked before further conclusion and inference is drawn.

Pesaran and Shin (1999) further asserted that the small sample properties of the bounds testing approach are superior to that of the traditional Johansen cointegration approach, which typically requires a large sample size for the results to be valid. More so, it allows for identification of both long-run and short-run coefficients of explanatory variables (Tang, 2008).

However, given both the Engle-Granger and the GLS-based cointegration tests, ARDL F – test possesses greater power than the two tests (Cook, 2006). Accordingly, the unrestricted error correction model (ECM) which follows the order of ARDL specification that capture both short run and long run is given as:

$$Y_{1t} = \beta_0 + \sum k_{1t-1} + \ldots\ldots\ldots\ldots\ldots\ldots \sum \beta_2 k_{t-n} + \sum \Omega_1 L_{t-n} + \ldots\ldots\ldots \sum \Omega_t \, LogX_{t-1} + u_t \ldots\ldots\ldots\ldots \quad 4$$

Where:

Y_{1t} is the endogenous variables included in the model.
$\sum k_{1t-1}$ is the n – numbers of exogenous variables to be included in the short run
$\sum \Omega_1 L_{t-n}$ is the long run multiplier within the context of ARDL model.
n is the number of lags to be included in the models.

However, the empirical ARDL model of the work as specified in equation *iii* can be explicitly re-specify below:

$$\Delta lnRGDP = \alpha_0 + \alpha_1 lnRGDP_{t-i} + \alpha_2 lnOC_{t-i} + \alpha_3 lnELC_{t-i} + \sum\beta_1 \Delta lnRGDP_{t-i} + \sum\beta_2 \Delta lnOC_{t-i} + \sum\beta_3 \Delta lnELC_{t-i} + \mu \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad 5$$

$$\Delta lnOC = \alpha_0 + \alpha_1 lnOC_{t-I} + \alpha_2 lnRGDP_{t-i} + \alpha_3 lnELC_{t-i} + \sum\beta_1 \Delta lnOC_{t-i} + \sum\beta_2 \Delta lnRGDP_{t-i} + \sum\beta_3 \Delta lnELC_{t-i} + \mu \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad 6$$

$$\Delta lnELC = \alpha_0 + \alpha_1 lnELC_{t-I} + \alpha_3 lnOC_{t-i} + \alpha_2 lnRGDP_{t-i} + \sum\beta_1 \Delta lnELC_{t-i} + \sum\beta_2 \Delta lnOC_{t-i} + \sum\beta_3 \Delta lnRGDP_{t-i} + \mu \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad 7$$

4. Result and Discussion

Pesaran et al. (2001) critical values are based on the assumption that the variables are integrated of order one I(1) or a combination with I(0). Unit root tests ensure that none of the series is integrated of I(2) or higher. Both the augmented Dickey–Fuller (ADF) and Phillips–Perron (PP) unit-root tests have been employed for that purpose and the results are summarized in Tables I.

Table 1: ADF and PP Unit Root Test Result

Variables	ADF test statistic		PP test statistic	
	Level	First Difference	Level	First Difference
LnRGDP	-0.378927	-3.280195**	0.380398	-3.209288**
LnOC	-1.690022	-7.059596***	-1.570610	-8.027412***
LnELC	-1.087327	-9.010960***	-1.641339	-9.010960***

Source: Author's E-views Computation

Table 1 shows the result of the stationary test for ADF-test and PP test respectively for the case of the energy model in Nigeria. Both tests revealed that RGDP, OC and ELC have a unit root at level, but become stationary at first difference, which implies that all the variables are I(1) series.

Going by the result of the unit root test, therefore, ARDL bound test for cointegration approach can be applied as it is capable of handling stationary at first difference I(1) variables. Thus, the determination of cointegration relationships using the ARDL technique does not face a problem from the existence of I(2) or beyond variables in the model specified.

4.1 Long run ARDL Bounds Tests for Cointegration

The procedure used in estimating the long-run relationship is a two-step procedure: an initial examination of the existence of a long-run relationship among the variables is followed by an estimation of the short-run and long-run parameters. The bound test result taking each of the variables as dependent is presented in the table below.

Table 2: ARDL Bounds Test for Cointegration

Dependent Variable	F statistics	Cointegration	Technique
LRGDP	15.25887	Yes	ECM
LOC	6.597886	Yes	ECM
LELC	3.694739	Inconclusive	SR ARDL

Source: Author's E-views Computation

The results in Table 2 show that RGDP, Oil Consumption and Electricity Consumption are cointegrated when RGDP and OC are taken as dependent variable given that the F-statistic = 15.25887 and 6.59788 respectively (with lag order of (1,4,4) selected by the AIC), as all are greater than the 5% Upper Bound critical value of Narayan (2005) and even the Pesaran et al. (2001) which is 3.478 and 4.335 respectively. However, taking Electricity Consumption (ELC) as a dependent variable, it establishes inconclusive co-integration status since the calculated F-statistic fall between the lower bound (I(0)) and upper bound (I(1)).

Therefore, the existence of a single co-integrating equation, according to Pesaran et al. (2001) indicates that there is a unique long-run relationship among the variables under consideration. In other words, as it is depicted in Table 2, with an intercept, the calculated F-statistics (15.23191) which is higher than the Pesaran, Shin, and Smith (2001) and Narayan (2005) upper bound critical values at 5% level of significance, this implies that the null hypothesis of $\alpha_1 = \alpha_2 = 0$ (there is no cointegration) is rejected based on the Pesaran, Shin, and Smith (2001) and Narayan (2005) critical values at 5% level of significance.

4.2 Long-run Model Estimation

The result of estimated coefficients of the long-run growth equation is presented in the table below:

Table 3: Estimated Long Run Coefficients using the ARDL Approach

Variables		LOC	LELC
LRGDP	**Coeff.**	16.44401	-0.608515
	Std. err	(4.535519)	(1.641743)

Source: Author's E-views Computation

Table 3 represents the long run cointegration test analysis coefficients, and existence of long run relationship which has been found among the model's variables. Having established that, the existence of the long run associated between real GDP, oil consumption and electricity, the model can be used to estimate long run and short run parameters.

The estimated coefficients show that oil consumption has a statistically significant positive impact on economic growth, which is in line with the theoretical argument that energy consumption positively contributes to economic growth. More specifically, the coefficient indicated that a 1 unit increase in oil consumption will lead to ₦16.4 million increases in Real GDP (economic growth) on the average, keeping other variables constant. However, Electricity Consumption has an insignificant negative effect on economic growth. This could be as a result of the country depending more on oil and also that the generation of electricity is expensive which is supplied at exorbitant prices that could make investment in the real sector less lucrative.

4.3 Long-Run Diagnostic Tests

To check the verifiability of the estimated long run model, some diagnostic tests are undertaken. The results reported in Table IV indicate that there is no serial autocorrelation, no heteroscedasticity and the Ramsy functional test specification identify that the model is well stated. Similarly, the normality test also shows that the errors are normally distributed.

Table 4: Diagnostic Tests

Test	Statistic/Chi-square	P-value
Serial Correlation test	2.5374	0.1030
Heteroscedasticity test	1.0659	0.4630
Functional Form test	0.8222	0.4198
Normality	0.1329	0.9357

Source: Author's E-views Computation

From the result presented in Table 4, we cannot reject *the null hypothesis of No serial correlation*. Hence, the model is free from the problem of serial correlation. Similarly, the model is free from the problem of heteroscedasticity (with P-value = 0.4630) using the Bruesch-Pagan tests as we cannot reject the *null hypothesis of homoscedastic.* Furthermore, the Ramsey functional form test confirms that the model is correctly specified. Hence, the relationship between the variables is verifiable or valid. The error term is normally distributed given that the result is insignificant at 5% (with Jacque Bera P-value = 0.9357), as such we cannot reject the *Null hypothesis that residual is normality distributed.*

In addition to the above diagnostic tests, the stability of the long run estimates has been tested by applying the cumulative sum of recursive residuals (CUSUM) and the cumulative sum of squares of recursive residuals (CUSUMSQ) test. Such tests are recommended by Pesaran and Shin (1999,2001).

Since the test statistics of these stability tests can be graphed, we can identify not only their significance, but also at what point of time a possible instability (structural break) occurred. *If the plot of the CUSUM and CUSUMSQ statistic moves between the critical bounds (at 5% significance level), then the estimated coefficients are said to be stable*.

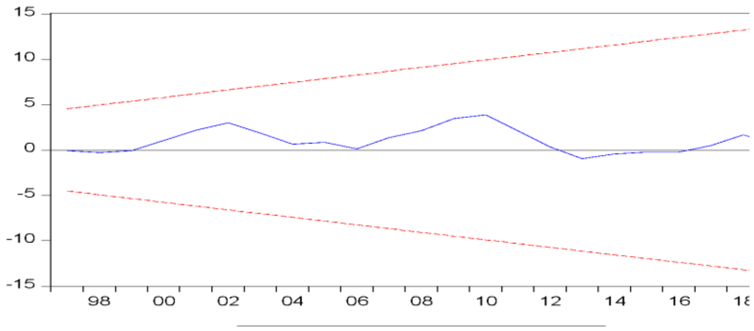

Fig 1. Plot of the cumulative sum of recursive residuals

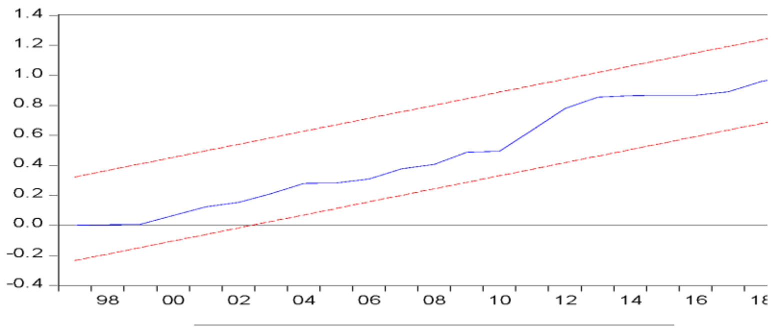

Fig 2. Plot of the cumulative sum of square of recursive residuals

The results of both CUSUM and CUSUMSQ tests are reported in Fig 1 and 2 above. Both plots do not traverse the lower and upper critical limits. Therefore, it can be concluded that those long and short runs estimates are stable. Hence the results of the estimated model are reliable and efficient.

4.4 Short Run Error Correction Estimates

The acceptance of at least one long-run equation of the growth model, paves way for the estimation of short-run Error Correction Model (ECM) for those variables that are cointegrated. The coefficient of determination (R-squared) is high, thus explaining that about 54.4% of the variation in economic growth or real GDP is attributed to the changes in the explanatory variables in the model.

The estimated equilibrium error correction coefficient (-0.0637) is highly significant at 5%, and it has the correct sign (negative). Hence, implying a slow speed of adjustment to equilibrium after a shock or distortion in the long run. About 6.37% of the disequilibrium from the previous year's shock or distortion converges back to the long-run equilibrium in the current year.

5. Conclusion and Recommendations

It could be concluded based on the findings of the research that a direct and positive relationship exists between energy consumption and economic growth in Nigeria particularly the energy generated from oil consumption. Therefore, increased energy consumption is a strong determinant of economic growth in Nigeria and should be given due consideration. However, the long-run coefficient of electricity consumption is negative and statistically insignificant. It could be concluded therefore, that, RGDP, OC, and ELC move together in the long run in the Nigerian economy and any disequilibrium among the variables is corrected at about 6.37% per annum.

Therefore, base the findings of the study, the following recommendations are paramount:

i. Huge investment is needed and should be encouraged to both local and foreign investors in the energy generating sector of the Nigerian economy.

ii. The government should foster the generation of electricity at a low and affordable price that is adequate enough to make investment more lucrative in the economy.

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