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BANKING SECTOR CONSOLIDATION; IMPLICATIONS FOR BANKS'PERFORMANCE IN NIGERIA

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Abstract

This paper investigates the effect of consolidation on banks' performance in Nigeria. In order to achieve the objective, gross profit, capital base, real GDP, financial deepening, interest rate, and the inflation rate of five (5) deposit money banks were selected and analysedusing the non-linear autoregressive and distributed lag (NARDL) method. The result shows that only capital base has both short run and long run asymmetry with bank performance. This was evidenced in the Zenith bank model result. Also positive shock in capital base exerted positive effect on performance in Zenith, UBA and Eco banks while positive shock in capital led to negative effect on the performance of FCMB and Diamond banks. The result also revealed the absence of asymmetry between real GDP, financial deepening, interest rate, inflation and banks' performance in all the five model studied. This implies that shocks in these variables exerted less influence on the performance of the banks. This study also found that 99%, 94%, 81%, 78% and 57% of the change in profits was determined by the level of capitalisation for Zenith, Eco, UBA, FCMB and Diamond Banks respectively. The implication of the result is that a strong capital base (consolidation) enhances banks' profitability in Nigeria. Based on these findings, this study recommends that banks should regularly go through periodic capital base reviews in order to enhance their performance in Nigeria's dynamic financial market.

Keywords: Consolidation, profitability, capital base, GDP, financial deepening, inflation rate, NARDL

1. Introduction

Insufficient capital base has been identified as a crucial variable responsible for low performance and instability in the Nigeria's banking industry over the years, stretching from modern times back to the colonial period. During the colonial period (1892 -1959), two sets of banks existed in Nigeria, referred to as domestic banks and foreign-owned banks, which existed and operated side by side in conducting banking businesses. Investigation revealed that the foreign-owned banks were relatively more highly capitalised than the indigenous banks and were discriminated in their operations (Onoh, 1982). The indigenous banks were characterised by frequent instability and depression, which led to the collapse of most of the commercial banks, which

were liquidated in quick succession (Nnanna, 2005). The foreign-owned counterparts survived this turbulent banking environment because of their strong capital base and the availability of highly skilled manpower.

Lemo and Imala (2005) argued that, before consolidation, bankers were engaged in unethical competitive behaviour as a result of the poor capitalisation of banks and this practice, leading to rent-seeking and business not related to core banking activities among the Nigerian banking financial institutions. Nnanna (2005) argued that, in historical context, the Nigeria banking system had gone through four phases. (a) The first era was described as unguided laissez-faire phase (1930-1959). During that period several undercapitalised and poorly supervised banks collapsed in their infancy. (b) The second phase was referred to as control regime (1960-1985). During this time the CBN ensured that only fit and proper persons were permitted to have licence and banks were subjected to a prescribed minimum paid-up capital base. (c) The third phase was described as post-structural adjustment programme (1986-2004). This period was characterised by neo-liberal philosophy where the free entry and exit of banks was over-stretched and obtaining licence was predicated on political patronage. (d) The emerging fourth phase is the era known as banking consolidation with a major emphasis on the merger and acquisition of banks and other reforms.

In spite of the crucial role played by mergers and acquisitions (M&A), which led to the emergence of consolidated banks in the sub-sector, the reforms were enunciated by the government, primarily to promote investments in the banking industry to facilitate real sector growth and economic development (Soludo, 2004). It should also be noted that all the reforms instituted by the financial sector have improvement in capital base as its major component. Hence minimum capital base of banks increased from N400,000 1970-78; N1.5m 1979 – 1987; N10m in 1988; N20m 1989 – 1990; N50m 1990 – 1995; N500m 1996 – 2001; N2billion 2002 – 2003 to N25billion from 2004 – Date (CBN, 2018). Though capital base of banks has increased over the years, most banks in Nigeria still experienced performance crisis. This paper seeks to examine how capital base of banks has affected the performance of banking sector in Nigeria. We continue our discussion by reviewing relevant literature, followed by the methodology used in achieving the objectives. Results, findings and conclusion follow thereafter.

2. Literature Review

The Structure-Conduct-Performance (SCP) by Mason (1939) states that increasing market concentration brings about oligopolistic tendencies and declining competitive behaviour of firms, resulting in higher prices and falling output in industrial organisations. The basis of this argument is that increasing levels of concentration (structure) enhances collusive and manipulative behaviours of banks, leading to the setting of higher prices and a reduction of output level (conduct), which eventually promotes higher performance (Mason, 1939). In another development, the SCP theory is a model of a relationship that influences the market structure, conduct, and performance of a firm in within an industrial organisation. In a study of Ghana on M&A by King Salami (2015), revealed that the impact of M&A had been focussed on testing the validity of efficiency hypothesis and structure-conduct performance (SCP) hypothesis. Investigations revealed that the efficiency hypothesis is predicated on economies of scale, while other gains from efficiency are all transmitted to various stake-holders as customers through better competitive prices. Moore (1959), on the other hand, argued that the structure conduct performance hypothesis on M&A is aimed at exploiting marker power and imposition of increased prices in the economy (Mason, 1939, Bain, 1951; 1954). The term structure, in this model, denotes a framework referring to the number of existing banking institutions operating in the whole industry (Nabieu, 2013). Market structure is affected by indigenous and exogenous factors. The internal variables include regulation and competitions, while the exogenous factors are economic, population, and technological dynamics. The term "conduct" describes the behaviour of the financial system in terms of the marketing, pricing, and innovation of the banking business environment and the term "performance" describes the quality and quantity of the products and services which are provided within a banking industrial organisation.

According to Mustapha (2014), in terms of structural development, the banking industry in Nigeria has gone through a chequered history. In 1959, there were only eight banks with 160 branches in the Nigerian banking environment. However, since independence, this figure has increased to forty banking institutions, with 1,316 branches spread across the country by December 1985. This period was characterised by heavy regulations which hampered competition, efficiency, and growth in the banking industry. The

study revealed, that following the introduction of neo-liberal policies in 1986, the number of banks increased unprecedentedly, and subsequently, most of the institutions collapsed because of a lack of adequate capital, mismanagement, and the absence of an effective regulatory environment. By 2004, the number of banks in the country reached 89, with varying sizes. Structurally, the industry exhibited a very high level of concentration, as 10 of the biggest banking institutions accounted for roughly 50% of the total assets and liabilities of the banking industry (Soludo, 2004).

Investigation reveals that the capital base of Nigerian banks was small compared to other countries, like Malaysia and South Africa. The small size of each existing bank, with high operating costs such as high investment in technology, separate costly headquarters, and high fixed and operating expenses, lead to high average cost of operations and widespread deposits and lending rates with heavy cost of intermediation. Attempts to survive in this harsh business environment led to unprofessional and sharp practices (professionally unethical conduct) by players in the industry. In an attempt to save the situation, the Central Bank of Nigeria introduced banking consolidation and reforms in 2004, which affected the existing structure of 89 banks by reducing them to 25; subsequently, another M&A of the banks reduced the number of institutions to 24 (Soludo, 2004; Sanusi, 2010).

Myriad of empirical works exist on the relationship between consolidation and bank's performance.Alexiou and Sofoklis (2009) studied the effects of bank-specific and macroeconomic determinants of bank profitability using an empirical framework incorporating the traditional Structure-Conduct-Performance (SCP) hypothesis. A panel approach was used to analyse six Greek banks with the results indicating macroeconomic factors such as inflation and private consumption appearing to play a significant role in shaping the performance of banking institutions. Additionally, bank-specific variables, such as capital, also play a critical role in determining bank profitability in Greece.

Lloyd-Williams, Molyneux and Thornton (1994) investigated the relevance of the SCP and efficient market hypothesis to analyse the Spanish banking industry using a "three firms" concentration ratio and market share of an individual firm to represent a firm's efficiency. The regression result revealed

a direct relationship between the market concentration and the performance of banks giving credence to the SCP hypothesis for the Spanish banking industry.

Kosmidou (2008) used an unbalanced pooled time series data for 23 banks to examine the factors influencing the performance of Greek banks during the period of EU financial integration (1990-2002). The result shows that an increase return on average assets (ROAA) was related to well-capitalised banks and a lower cost to income ratios. Bank size was positive in all cases but statistically significant only when the macroeconomic and financial structure variables were included in the models. Macroeconomics and financial structure-like growth of gross domestic product (GDP) exhibits a significant and positive impact on ROAA, while inflation has a negative but significant effect on bank profits.

Albertazzi and Gambacorta (2009) evaluated banking profitability shocks to both macroeconomic and financial factors by examining a set of equations for net interest income, non-interest income, operating costs, provisions, and profit before taxes, for banks in the main industrialised countries principally the Euro area and Anglo-Saxon countries. The study reports a significant relation between real GDP growth and bank profitability in European countries.

Calza, Gartner and Sousa (2001), employ the Johansen methodology to investigate the factors influencing loans to the private sector in the European countries. Their findings indicate that, in the long-run, real loans are directly linked to real GDP and negatively to real short-term and long-term interest rates. The study also indicates a long-run demand equation. In estimating the short-run dynamics using the Vector Error Correction Model (VECM), the result also indicates no signs of structural breaks during the sample period (1980 Q1 - 1999 Q2). All of this suggests that developments in real loans to the private sector in the EEC area can be reasonably explained by the model. This finding implies that real GDP has a serious implication on loans to the private sector with regards to banks performance in this model.

Claeys and Vander Vennet (2008) similarly studied the determinants of bank interest margins in the Central and Eastern European countries (CEEC) and found that banking in the CEEC is on a virtuous path, at least in the EU

accession countries. They also discovered that increased efficiency benefits customers, while capital adequacy supports systemic stability. The study further found a strong nexus between the price level, financial intermediation and economic growth, as funding costs have a serious implication on the investment level and capital allocation. It also has an impact, in turn, on growth potential and the direction of economic activity, which affects the profitability of the banking sector, and therefore its stability and ability to support the real economy. The implications of their finding are that the interest rate, the inflation rate and financial development have serious implications for bank interest margin or performance.

Pasiouras and Kosmidou (2007) submitted that large bank size is positively related to bank profitability. To them, larger banks are likely to have a higher degree of product and loan diversification than smaller banks, which reduces risk due to economies of scale from a larger size. They further argued that reduced risk and economies of scale lead to increased operational efficiency, and hence, a positive effect on bank profitability. This finding demonstrates that an increase in bank size which results from merger and consolidation, impacts positively on a bank's performance.

Dietrich and Wanzenried (2011) studied the extent to which bank-specific features, macroeconomic variables, and industry-specific factors affected the profitability of 453 commercial banks in Switzerland, over the period 1999 to 2008. To achieve the objectives of study, the bank crisis period was separated into the following areas: The years before banking of crisis 2006 and the crisis years 2007 and 2008. The result indicated that better-capitalised banks seem to be more profitable. While the cost-income ratio was found to be relevant to the return on assets before the crisis only, the negative impact of the loan loss provisions relative to total loans is much stronger during the crisis. The finding of the study further revealed that if a bank's loan volume is growing faster than the market size, the impact on bank profitability will be positive, at least before the crisis. The findings also show that banks with a higher interest income share are less profitable, which holds again for the pre-crisis period only. In addition, the negative effect of state ownership on bank profitability does not hold during the crisis, and the same holds for foreign bank ownership. Finally, certain industry-specific and macroeconomic variables like real GDP and the interest rate also have significant effect on profitability

of banks. These findings imply that capital base and macroeconomic factors – real GDP, interest rate and price level - have serious implication on a bank's profitability.

Garcia-Herrero, Gavila and Santabarbara (2009) examined the determinants of profitability for Chinese banks using panel data for 87 banks from 1997 to 2004. The result of their investigation shows that better capitalised banks tend to be more profitable. The result was same for banks with a relatively larger number of deposits and for more X-efficient banks. Another serious finding was that a less concentrated banking system increases bank profitability, which reflects the concept that SOCBs have been the major bulwark due to their size and performance. The macroeconomic variables, like real interest rates on credits and inflation, stimulated profitability, whereas the volatility of interest rates reduces it. In addition, profitability of banks appears to be quite consistent in China, which indicates impediments to competition due to government regulation. This reason shows that government decisions affect profitability of banks in China.

The findings of the study by Iannotta, Nocera and Sironi (2007) confirms a significant difference in performance and risk. Specifically, the result shows that private banks enjoy a higher profitability than mutual and public-sector banks. To the author, the improved profitability performance emanates from a higher net return on their earning assets rather than from a superior cost efficiency. The findings further revealed that public and mutual bank's costs are relatively lower. It also shows that in term of risk, public sector banks have a poorer loan quality and a higher insolvency risk than other types of banks, while mutual banks have better loan quality and lower asset risk than both private and public-sector banks. This finding supports the bank consolidation structure-conduct-performance theory.

Kasman, Tunc, Vardar and Okan (2010), studied consolidation and commercial bank net interest margin using evidence from the old and new European Union using panel analysis over the period (1995 –2000). The findings from the study show that all the explanatory variables were positively related to the bank's net interest margin in the initial sub-period, except for the size, managerial efficiency, GDP growth, and capitalisation. Bank size was found to have a negative and significant impact on the net interest margin.

Managerial efficiency had a negative and significant coefficient, suggesting that banks experiencing managerial efficiency are able to obtain interest loans and lower cost deposits. Real income (GDP) had a negative and significant effect on interest margin. This behaviour could be traced to the relatively high volatility of the business cycle in new EU member and candidate countries where periods of economic growth have sometimes been interrupted by periods of crisis. The results further indicated that market power, operating costs, capital adequacy, default risk, credit risk, implicit interest payments and inflation are all positively and significantly related to a bank's net interest margins. The positive impact of price level suggests that a lower price level has a serious diminishing impact on long term compared to short-term interest rates, leading to a decline in net interest margins.

Pasiouras and Kosmidou (2007) studied the factors affecting the profitability of European domestic and foreign banks, using an unbalanced panel data set of 224 observations, covering the period 1995- 2002. Findings from the study show that capital base is the major factor influencing bank profit in the United Kingdom. Other significant variables affecting profitability, as revealed in the study, were cost-to-income ratio and bank size, both of which impact negatively on bank profits. In specific terms, liquidity was negatively related to the net interest margin but positively related to ROAA. The impact of loan loss reserves was also not certain, being positive and significant on NIM, implying that higher risks result in higher margins but are negative and insignificant on ROAA.

Staikouras, and Wood (2003), in their study on determinants of profitability of banks in Europe, found a positive relationship between bank liquidity and profitability. They also found that banks holding more liquid assets benefit from a superior perception in funding markets, reducing their financing costs and increasing their profitability. Angbazo, (1997) assessed and identified the determinants of net interest margin in the Ethiopian banking industry using an unbalanced panel data gathered from commercial banks and the National Bank of Ethiopia for the period 1997 to 2014, examining the effects of changes in internal and external factors on the performance of banks. The findings of the study indicated that cost efficiency, implicit interest payment, competition and scale efficiency had a consistently positive and significant effect on the net interest margin. Whereas, liquidity risk and management efficiency had

negative and significant effect on the net interest rate margin. However, inflation and gross domestic product did not exert a significant impact on the net interest rate margin. The study by Angbazo concludes that both bank specific and industry factors are indispensable determinants of commercial bank's performance in Ethiopia.

Adegbuju and Olokoyo (2008) found in their study that, as a developing economy within the global community, the financial sector in the nation's economy in the past years has experienced unparalleled changes in ownership structures and rapid development in banks' operational mechanism.

Adequate capitalisation of banks is a necessary condition in order for banks to acquire fixed assets to absorb shock during an emergency, for infrastructural development and free funds for branch expansion programmes, including confidence building in the general public (Ogunleye, 1997). The indigenous banks were unable to perform the foregoing functions adequately, accounting for their early liquidation, with these factors forming the founding pillars upon which the international banks grew and expanded in the same environment where the domestic banks were wobbling (Ayodele, 1988; Onoh, 2002; Oghafor, 2012). The study revealed that during the post-independence era, the low capital structure of banks still arose as a crucial factor and a recurring decimal that precipitated the continual systemic banking instability until recent times, when the Central Bank and the Federal Government introduced the banking consolidation policy in 2004 (CBN, 2008).

The work by Nwankwo (2012) used multiple panel regression analysis in his investigation, incorporating money supply, GDP, interest rates, and excess reserve without capital base, which was the main focus of the present study, making it different in approach and focus from previous studies. The performance of the Nigerian economy is affected by a wide range of factors based on fiscal and monetary policies. This means that deficit financing by the federal government, trade policies, exchange rate determination, and balance of payment management, including different subsidy regimes together, can also affect the behaviour of an economy.

The behaviour of the Nigerian economy is affected by many macroeconomic variables, including banking consolidation. The effects of the other

macroeconomic variables in the economy manifest in multidimensional ways that intervene in the assessment of the specific impact of consolidation on the performance of banking sub-sector. This explains why the current study focuses specifically on the impact of consolidation on performance in the banking sub-sector, rather than investigating the impact of consolidation on the performance of the Nigerian economy generally. Performance is measured in terms of profitability. These are gaps and weaknesses that make the present work original and different from the previous studies in the rea we are investigating.

3. Methodology

The triangular relationship of Structure-Conduct-Performance(SCP) hypothesis argues that an increasing level of concentration (structure) enhances the collusive and manipulative behaviour of banks, which leads to the setting of higher prices and a reduction in output, which eventually promotes higher profitability (Mason, 1939). On the other hand, the efficient market hypothesis shows that a very sound institution, in relation to its competitive environment, can optimise profitability by controlling its existing size and price policies or reducing its price and expanding its operational mechanism. This implies that only an operationally viable firm can elucidate the direct link between profitability and expansion. Consolidation widens the scope (structure) of deposit money banks through merger and acquisition and also makes banks less competitive. Increase in bank size and less competition, all things being equal, could stimulate the profit of banks. Earlier studies on structure-conduct-performance and efficient market hypotheses are, Lloyd-William, Molyneux and Thornton (1994), on bank performance in Spanish banking industry and the Alexious and Sofoklis (2009) study of the determinants of profitability in Greece. Both studies also used the panel analysis methodology.

Given the above background, the study adopted a modified Structure-Conduct-Performance (SCP) framework, which postulates that as a small number of firms constitute the larger share of the market/industry, the structure moves from perfect to imperfect competition. This development forms the basis of the collusion hypothesis that characterises oligopoly and other imperfect markets. According to Smith and Trigeorgis (2004), the SCP model simply

implies that increasing market concentration leads to less competitiveness in terms of higher prices and less output, resulting in higher profits at the expense of lower consumer welfare. However, the authors criticised the SCP hypothesis on the ground that it constrains the user to capture the structure, conduct and performance, while at the same time, making it difficult to isolate each feature one at a time.

The study also adopts a major empirical method proposed by Panzar and Rosse (1987) – the P-R model. This model, according to Tule et al (2016), has been successfully used to remedy the shortcomings of the SCP model by testing the conduct directly without recourse to industry structure. The P-R model determines the competitive appetite of banks using the comparative features of the reduced-form revenue functions based on cross-sectional data. It assumes that a bank maximises its profits at the point where marginal revenue is equal to marginal cost. Assume that a bank's revenue function is defined as:

$TR_i = TR_i (X_i, Y_u)$

Where: X_i= a vector of output of bank I and

Y_u = a vector of exogenous variables which affect the revenue function of bank i.

Profitability/performance of banks is defined in terms of the output vector, while the exogenous variables define the capital base, interest rate, real GDP, price level and financial growth.

To further analyse the impact of banking sector consolidation on the performance of banks, the study uses a regression model to examine how consolidation has impacted on the performance of deposit money banks in Nigeria. Earlier work by Park (2012) and recent work by Tule et al (2016) used net interest margin as a measure of performance, this study however, deviated from these studies by using gross profit of banks as a measure of performance since the accounting profit is the main indicator for measuring the financial performance of the enterprise (Trujillo-Ponce, 2010). Hence in this study, we estimated a bank performance equation defined thus:

$Prft_i = f(CAP_i, MACRON_i)$

Where: $Prft_i$= gross profit of banks

CAP_i, = banking sector consolidation defined in terms of level of capitalisation

$MACRON_i$= macroeconomic environment or exogenous variables that affect bank performance, such as real income level (GDP), price level (INFR), interest rate (INTR) and financial growth (MSS/GDP). In order to achieve the objectives of this study, gross profit, capital base of the selected 5 banks and the identified macroeconomic variables were incorporated into the performance model. These banks were selected from 24 banks doing business in Nigeria, using the purposive sampling technique.The prevailing interest rate, inflation rates, real GDP and level of financial deepening for the four quarters of 2001–2016 were analysed using the non-linear autoregressive distributed lag approach.

$$PRFT_{it} = \mathrm{f}\left(CAP_{it},\ INTR_{it}, \mathrm{FID}_{it,} GDP_{it}, INFR_{it}\right) \quad 1$$

Where: $PRFT_{it}$= profit of the selected 5 banks; $CAPB_{it}$= capital base of the 5 selected banks; $INTR_{it}$= interest rate (lending rate) of the banks; FID_{it}= level of financial deepening; $RGDP_{it}$ = real GDP; $INFRg_{it}$ = inflation rate/price level. During estimation, parameters are introduced and a disturbance term 'u' to take care of variables not included in the model, but those that affect economic growth. Hence, equation 1 above is transformed as follows:

$$PRFT_{it} = \beta_i + \beta_1 CAP_{it} + \beta_2 INTR_{it} + \beta_3 FID_{it} + \beta_4 GDP_{it} + \beta_5 INFR_{it} + u_{it} \quad 2$$

Dynamic Specification of the Non-Linear Autoregressive Distributed lag (NARDL) Model for Banks' Performance in Nigeria

The unit root tests result revealed that the variables under consideration were stationary at either level i(0) or first difference i(1) hence the used of NARDL methodology. The nonlinear ARDL model is a recently developed model by Shin et al. (2014). It is different from the non-linear ARDL model by Pesaran et al. (2001). The NARDL explains for imbalances (asymmetries) in the movements of variables. Its simultaneously performs well in small samples

and it is applicable in mixed order integrated variables. It also deals effectively with pre-testing bias in a model. It should be noted that most economic relationships are non –linear, hence NARDL tends to account for such relationship in its analysis.

In order to estimate the effect of banking sector consolidation on performance (profitability), the NARDL model of performance and the interacting variables (independent variables) is stated below.

$$\Delta PRFT_{it-1} = \sum_{i=1}^{n} \alpha_0 \Delta PRFT_{it-1} + \sum_{i=1}^{n} \alpha_1 \Delta CAP_{it-1} + \sum_{i=1}^{n} \alpha_2 \Delta GDP_{it-1} + \sum_{i=1}^{n} \alpha_3 \Delta INTR_{it-1} + \sum_{i=1}^{n} \alpha_4 \Delta INFR_{it-1}$$

$$\sum_{i=1}^{n} \alpha_4 \Delta FID_{it-1} + {}_{\delta_0} \Delta PRFT_{it-1} + {}_{\delta_1} \Delta CAP_{it-1} + {}_{\delta 2} \Delta GDP_{it-1} + {}_{\delta 3} \Delta INTR_{it-1} + {}_{\delta 4} \Delta INFR_{it-1} + {}_{\delta 5} \Delta FID_{it-1} + \varepsilon_{it}$$

6.2

It is pertinent that so many relationships among economic variables tend to follow a non-linear path as opposed to the more common linear assumptions. The speed at which macroeconomic variables move in the downward direction is often not the same as that of the upward side, thus suggesting non-linear behaviour. Consequently, the information content embedded in linear relationships may not be appropriate in enhancing strong inference and findings (Shin, Yu and Greenwood (2014). The implication of the foregoing is that the swinging of positive and negative components of regressorsaround an assumed zero threshold have crucial role to play in establishing long run relationships among the variables.

The asymmetric ARDL of Shin, Yu and Greenwood (2014) derive from the expansion of the linear ARDL formulation of Pesaran, Shin and Smith (2001). Following the works of Schoderet (2003), Shin, Yu and Greenwood (2014) and Huang and Lin (2009), the non-linear long run equation is specified as:

$$y_{it} = \alpha^{+} x_{it}^{+} + \alpha^{-} x_{it}^{-} + \varepsilon_{it} \qquad 6.3$$

Where x_{it} is a k x 1vector of regressors. Given that x_{it} is defined to be a random walk, such that:

$$x_{it} = x_{(it-1)} + e_{it},$$
$$e_{it} \sim \mathrm{N}(0, \delta_e^2) \quad 6.4$$

When equation (5.1) is linked to the symmetric ARDL of Pesaran Shin and Smith (2001), the following non-linear variant of the unrestricted ECM is obtained;

$$\Delta PRFT_{it} = \alpha + \rho PRFT_{it-1} + w_2^+ x_{it-1}^+ + w_2^- x_{it-1}^- + \sum_{i=1}^{\rho-1} \theta_i \Delta PRFT_{it-1} + \sum_{i=0}^{q-1} \lambda_i^+ \Delta x_{it-1}^+ + \sum_{i=0}^{q-1} \lambda_i^- \Delta x_{it-i}^- + \varepsilon_{it} \quad 6.5$$

Where $w_2^+ = -\rho\alpha^+$ and $w_2^- = -\rho\alpha^-$ and θ_i is the autoregressive parameter λ_i^+ and λ_i^- are the symmetric distributed lag parameters; ε_t is the stochastic error term that is independently and identically distributed with zero mean and constant variance. Hence equation 6.5 could be rewritten thus:

$$\Delta PRFT_{it} = \alpha + \rho PRFT_{it-1} + w_2^+ x_{it-1}^+ + w_2^- x_{it-1}^- + \sum_{i=1}^{\rho-1} \theta_i \Delta PRFT_{it-1} + \sum_{i=0}^{q-1} \lambda_i^+ \Delta x_{it-1}^+ + \sum_{i=0}^{q-1} (\lambda_i^- \Delta x_{it-i}^-) + \varepsilon_{it} \quad 6.6$$

The restricted ECM could be written thus:

$$\Delta PRFT_{it} = K_1 ecm_{it} + \sum_{i=1}^{\rho-1} \theta_i \Delta PRFT_{it-1} + \sum_{i=0}^{q-1} (\lambda_i^- \Delta x_{it-i}^-) + \varepsilon_{it} \quad 6.7$$

The rationale for testing for asymmetric cointegration is based on the general form of non- linear ARDL model:

$$PRFT_{it-1} + w_2^+ CAP_{it-1}^+ + w_2^- CAP_{it-1}^- + w_2^+ GDP_{it-1}^+ + w_2^- GDP_{it-1}^- +$$
$$w_2^+ INTR_{it-1}^+ + w_2^- INTR_{it-1}^- + w_2^+ INFR_{it-1}^+ + w_2^- INFR_{it-1}^- + w_2^+ FID_{it-1}^+ + w_2^- FID_{it-1}^-$$
$$+$$
$$\sum_{i=1}^{\rho-1} \lambda_i \Delta PRFT_{it-1} + \sum_{i=0}^{q-1} (\lambda_i^+ \Delta CAP_{it-i}^+ + \lambda_i^- \Delta CAP_{it-i}^- + \lambda_i^+ \Delta GDP_{it-i}^+ + \lambda_i^- \Delta GDP_{it-i}^-$$
$$+ \lambda_i^+ \Delta INTR_{it-i}^+ + \lambda_i^- \Delta INTR_{it-i}^- + \lambda_i^+ \Delta INFR_{it-i}^+ + \lambda_i^- \Delta INF_{it-i}^- + \lambda_i^+ \Delta FID_{it-i}^+ + \lambda_i^- \Delta FID_{it-i}^-) + \varepsilon_{it}$$
6.8

Where $PRFT_{it}$ = profit of the five banks, CAP_{it}= capital base of the banks, GDP_{it}=real income national level, $INTR_{it}$=Interest rate (lending rate), $INFR_{it}$= price level and FID_{it}= financial deepening (MSS/GDP).

In like manner, CAP^{+}_{it-i}, CAP^{-}_{it-i}; $GDP^{+}_{it-i}, GDP^{-}_{it-i}; \mathrm{INTR}^{+}_{it-i}, \mathrm{INTR}^{-}_{it-i}; \mathrm{FID}^{+}_{it-i}, \mathrm{FID}^{-}_{it-i};$ are partial sums of positive and negative changes in the specific bank consolidation indicators while p and q present the lag selection order for the dependent and independent (exogenous) variables in distributed lag.

The Asymmetric Cointegration Test: the following null hypothesis of no cointegration which involve the coefficients of the level form of: $PRT_{it,} GDP^{+}_{it}, GDP^{-}_{it}; \mathrm{INTR}^{+}_{it}, \mathrm{INTR}^{-}_{it}; \mathrm{FID}^{+}_{it}, \& \mathrm{FID}^{-}_{it}$ were tested using Pesaran et al. (2001), and Atil et al (2014) procedure.

$$H_0 = p = w_2^{+} = w_2^{-} = 0 \qquad 6.9$$

The decision rule follows that: if the empirical value of the F-statistics exceeds the upper bound critical value at 5 percent level of significance, it provides evidence on the existence of long run relationship between the variables but if the computed value is below the lower bound, it means there is no cointegration. The test is considered inconclusive if the calculated F-statistics lies between the two bounds. If the above hypothesis is rejected, then an error correction model must be formulated to account for the short run and long run relationships simultaneously.

The Wald test was used to test for both short run and long run symmetry. A non-rejection of the hypotheses of short run and long run symmetric effects means that the original symmetric ARDL formulation of Pesaran et al. (2001) will hold.

We started the analysis by examining the unit roots characteristics of the variables under consideration. The essence of this test is to ensure the data conformed to the basic assumption of OLS (constant mean and variance). The test was carried out using the Philip-Peron procedure. The result of the test for the 5 banks' model is reported below:

4. Results

Table 1. Unit root Test Result for Zenith and FCMB Banks

Zenith Bank Unit Roots Test- Philip-Peron procedure					**FCMB Unit Roots Test - Philip-Peron procedure**			
Variable	**PP Statistic**	**1%**	**5%**	**Remark**	**PP Statistic**	**1%**	**5%**	**Remark**
PRFT	-9.499980	-3.596616	-2.933158	i(1)	-4.379229	-3.592462	-2.931404	i(0)
CAP	-6.119054	-3.596616	-2.933158	i(1)	-9.652976	-3.596616	-2.933158	i(1)
GDP	-6.331670	-3.596616	-2.933158	i(1)	-6.331670	-3.596616	-2.933158	i(1)
INTR	-5.970506	-3.596616	-2.933158	i(1)	-5.970506	-3.596616	-2.933158	i(1)
INFR	-3.557064	-3.596616	-2.933158	i(1)	-3.557064	-3.596616	-2.933158	i(1)
FID	-6.357971	-3.596616	-2.933158	i(1)	-6.357971	-3.596616	-2.933158	i(1)

Source: Researchers' Computation

Table 2. Unit root Test Result for Diamond and ECO Banks

Diamond Bank Unit Roots Test- Philip-Peron procedure					**ECO Bank Unit Roots Test- Philip-Peron procedure**			
Variable	**PP Statistic**	**1%**	**5%**	**Remark**	**PP Statistic**	**1%**	**5%**	**Remark**
PRFT	-4.810029	-3.592462	-2.931404	i(0)	-5.280265	-3.592462	-2.931404	i(0)
CAP	-6.135989	-3.592462	-2.931404	i(0)	-6.259187	-3.592462	-2.931404	i(0)
GDP	-6.331670	-3.596616	-2.933158	i(1)	-6.331670	-3.596616	-2.933158	i(1)
INTR	-5.970506	-3.596616	-2.933158	i(1)	-5.970506	-3.596616	-2.933158	i(1)
INFR	-3.557064	-3.596616	-2.933158	i(1)	-3.557064	-3.596616	-2.933158	i(1)
FID	-6.357971	-3.596616	-2.933158	i(1)	-6.357971	-3.596616	-2.933158	i(1)

Source: Researchers' Computation

Table 3. UBA Unit Roots Test – Philip-Peron Procedure

Variable	PP Statistic	1%	5%	Remark
PRFT	-4.810574	-3.592462	-2.931404	i(0)
CAP	-6.135953	-3.592462	-2.931404	i(0)
GDP	-6.331670	-3.596616	-2.933158	i(1)
INTR	-5.970506	-3.596616	-2.933158	i(1)
INFR	-3.557064	-3.596616	-2.933158	i(1)
FID	-6.357971	-3.596616	-2.933158	i(1)

Source: Researchers' Computation

The unit roots tests conducted for the five banks' models as reported in *tables 1, 2 and 3* indicate that the variables were integrated at different orders {order zero i(0) and order one i(1)} hence the used of NARDL method for the analysis of short and long run relationship between banking sector consolidation and the performance of banks.These results imply that the null hypothesis of non-stationarity for all the variables was rejected. Based on the stability of the variables, we went further to establish whether or not there is a long-run cointegrating relationship amongst the variables by using the NARDL bound test Shin et al. (2014)

Table 4. Short run NARDL Result Zenith Bank Model – Dependent Variable PRFT, Model Selection-order criteria (1, 1, 1, 1, 2, 1)

Variable	Coefficient	T- Statistic	Probability
$PRFT_{t-1}$	-1.96	-7.11***	0.00
CAP^{+}_{t-1}	0.26	5.84***	0.00
CAP^{-}_{t-1}	0.29	6.29***	0.00
GDP^{+}_{t-1}	-0.002	-0.04	0.97
GDP^{-}_{t-1}	0.14	1.12	0.29
$INTR^{+}_{t-1}$	0.14	0.86	0.41
$INTR^{-}_{t-1}$	0.45	0.48	0.64
$INFR^{+}_{t-1}$	1.09	1.26	0.24
$INFR^{-}_{t-1}$	-0.79	-5.74***	0.00

FID^{+}_{t-1}	-0.51	-0.47	0.65
FID^{-}_{t-1}	0.17	0.13	0.90
$\Delta PRFT_{t-1}$	0.31	2.33**	0.04
ΔCAP^{+}	0.18	17.35***	0.00
ΔCAP^{+}_{t-1}	0.01	0.61	0.55
ΔCAP^{-}	0.14	15.48	0.00
ΔCAP^{-}_{t-1}	-0.05	-2.48	0.04
ΔGDP^{+}	-0.001	-0.16	0.88
ΔGDP^{+}_{t-1}	0.001	0.35	0.73
ΔGDP^{-}	0.001	0.04	0.97
ΔGDP^{-}_{t-1}	0.007	0.48	0.64
$\Delta INTR^{+}$	-0.02	-0.12	0.91
$\Delta INTR^{+}_{t-1}$	0.15	0.59	0.57
$\Delta INTR^{-}$	0.79	1.75	0.11
$\Delta INTR^{-}_{t-1}$	-0.77	-2.04	0.07
$\Delta INFR^{+}$	0.95	0.90	0.39
$\Delta INFR^{+}_{t-1}$	0.25	1.73	0.12
$\Delta INFR^{-}$	-1.62	-5.65***	0.00
$\Delta INFR^{-}_{t-1}$	0.48	2.01	0.08
ΔFID^{+}	-0.05	-0.69	0.51
ΔFID^{+}_{t-1}	0.03	0.41	0.69
ΔFID^{-}	-0.002	-0.02	0.99
ΔFID^{-}_{t-1}	0.04	0.35	0.73
Cons	13.97	2.64**	0.03

Source: Researchers' Computation

Table 5. Long-run Effect Result - Zenith Bank model

Long-run effect [+]				Long-run effect [-]		
Exog. Variable	Coefficient	F-Stat.	Prob.	Coefficient	F-Statistic	Probability
Cap	0.134	350.7***	0.00	-0.15	795.7***	0.00
Gdp	-0.000	0.002	0.97	-0.01	1.17	0.31
Intr	0.071	0.708	0.42	-0.23	-0.23	0.64
Infr	0.556	1.498	0.25	0.41	20.94***	0.00
Fid	-0.026	0.218	0.65	-0.01	0.018	0.89

Table 6. Long –run, Short-run asymmetry and Cointegration Test Results – Zenith Bank Model

Long-run asymmetry			Short-run asymmetry		Cointegration test statistics for Zenith Bank Model	
Wald Test	F – Statistic	Probability	F – Statistic	Probability	T_BDM	F_PSS
Cap	7.04***	0.03	12.43***	0.001	-7.1056	29.6975
Gdp	0.22	0.29	0.08	0.78		
Intr	0.10	0.76	0.14	0.71		
Infr	3.45	0.09	2.84	0.13		
Fid	3.09	0.11	0.05	0.83		

Source: Researchers' Computation

Table 7. Model Diagnostic Test for Zenith Bank Model

Test	Statistic	Prob	Decision
Portmanteau test up to lag 19 (chi2)	12.09	0.88	Accept H_0
Breusch/Pagan heteroscedasticity test (chi2)	0.24	0.62	Accept H_0
Ramsey RESET test (F)	3.53	0.09	Accept H_0
Jarque-Bera test on normality (chi2)	1.30	0.52	Accept H_0

Source: Researchers' Computation

Table 8. Short run NARDL Result FCMB Model – Dependent Variable PRT, Model Selection-order criteria (1, 2, 1, 1, 2, 1)

Variable	Coefficient	T- Statistic	Probability
PRT_{t-1}	-0.86	-0.74	0.49
CAP^{+}_{t-1}	-0.53	-0.95	0.39
CAP^{-}_{t-1}	0.46	0.05	0.96
GDP^{+}_{t-1}	0.12	2.02	0.09
GDP^{-}_{t-1}	-0.02	-0.05	0.96
$INTR^{+}_{t-1}$	-3.69	-0.77	0.48
$INTR^{-}_{t-1}$	5.80	0.98	0.37
INF^{+}_{t-1}	4.52	0.80	0.46
INF^{-}_{t-1}	-2.57	-0.48	0.65

FID^{+}_{t-1}	3.15	2.42	0.06
FID^{-}_{t-1}	3.54	2.40	0.06
ΔPRT_{t-1}	-0.77	-2.03	0.09
ΔCAP^{+}	-0.42	-1.02	0.35
ΔCAP^{+}_{t-1}	1.59	2.44	0.06
ΔCAP^{-}	1.50	2.65	0.05
ΔCAP^{-}_{t-1}	-0.18	-1.36	0.23
ΔGDP^{+}	0.15	2.55	0.05
ΔGDP^{+}_{t-1}	-0.29	-0.75	0.49
ΔGDP^{-}	-0.19	-0.83	0.45
ΔGDP^{-}_{t-1}	-0.60	-2.92	0.03
$\Delta INTR^{+}$	-3.26	-0.95	0.39
$\Delta INTR^{+}_{t-1}$	-7.40	2.34	0.07
$\Delta INTR^{-}$	-3.64	-0.96	0.38
$\Delta INTR^{-}_{t-1}$	10.59	1.67	0.16
ΔINF^{+}	6.81	0.95	0.39
ΔINF^{+}_{t-1}	8.80	2.64	0.05
ΔINF^{-}	1.93	0.86	0.43
ΔINF^{-}_{t-1}	-4.17	-0.93	0.39
ΔFID^{+}	-0.50	-0.60	0.58
ΔFID^{+}_{t-1}	-4.05	-3.38	0.02
ΔFID^{-}	4.10	2.84	0.04
ΔFID^{-}_{t-1}	-0.32	-0.29	0.78
Cons	-6.61	-0.27	0.80

Source: Researchers' Computation

Table 9. Long run Relationship/Effects – FCMB Model

Long-run effect [+]				Long-run effect [-]		
Exog. Variable	Coefficient	F-Stat.	Prob.	Coefficient	F-Statistic	Probability
Cap	-0.613	0.188	0.683	-0.053	0.003	0.960
Gdp	0.139	0.402	0.554	0.018	0.003	0.961
Intr	-4.278	0.553	0.491	-6.728	0.602	0.473
Inf	5.241	0.228	0.653	2.981	0.110	0.753
Fid	3.653	0.421	0.545	-4.104	0.428	0.542

Source: Researchers' Computation

Table 10. Long –run, Short-run asymmetry and Cointegration Test Results – FCMB Model

Long-run asymmetry			Short-run asymmetry		Cointegration test statistics for FCMB Model	
Wald Test	F – Statistic	Probability	F – Statistic	Probability	T_BDM	F_PSS
Cap	0.176	0.692	0.028	0.874	-0.7398	4.8281
Gdp	0.227	0.654	6.188	0.055**		
Intr	1.094	0.343	3.540	0.119		
Inf	0.184	0.656	3.303	0.129		
Fid	0.261	0.631	6.914	0.047**		

Source: Researchers' Computation

Table 11. Model Diagnostic Test for FCMB Model

Test	Statistic	Prob	Decision
Portmanteau test up to lag 19 (chi2)	29.11	0.06	Accept H_0
Breusch/Pagan heteroscedasticity test (chi2)	0.53	0.47	Accept H_0
Ramsey RESET test (F)	10.27	0.09	Accept H_0
Jarque-Bera test on normality (chi2)	0.22	0.89	Accept H_0

Source: Researchers' Computation

Table 12. Short run NARDL Result Diamond Bank Model – Dependent Variable PRFT Selection – order criteria (0, 0, 1, 1, 2, 1)

Variable	Coefficient	T- Statistic	Probability
PRT_{t-1}	-4.89	-2.73	0.04
CAP^{+}_{t-1}	-0.44	-2.19	0.08
CAP^{-}_{t-1}	-0.80	-0.48	0.65
GDP^{+}_{t-1}	0.32	1.47	0.20
GDP^{-}_{t-1}	0.19	0.27	0.80
$INTR^{+}_{t-1}$	0.50	-0.06	0.96
$INTR^{-}_{t-1}$	-14.38	-0.94	0.39
$INFR^{+}_{t-1}$	-18.89	-1.22	0.28
$INFR^{-}_{t-1}$	1.94	0.75	0.49
FID^{+}_{t-1}	1.40	0.50	0.64

FID^{-}_{t-1}	-0.14	-0.05	0.96
ΔPRT_{t-1}	2.54	2.11	0.09
ΔCAP^{+}	0.04	1.74	0.14
ΔCAP^{+}_{t-1}	0.42	2.45	0.06
ΔCAP^{-}	-0.03	-0.27	0.80
ΔCAP^{-}_{t-1}	0.13	1.47	0.20
ΔGDP^{+}	0.48	1.45	0.21
ΔGDP^{+}_{t-1}	-0.04	-0.52	0.63
ΔGDP^{-}	-0.48	-1.24	0.27
ΔGDP^{-}_{t-1}	-0.91	-1.22	0.28
$\Delta INTR^{+}$	-3.98	-0.69	0.52
$\Delta INTR^{+}_{t-1}$	-9.60	-1.05	0.34
$\Delta INTR^{-}$	-4.12	-0.67	0.54
$\Delta INTR^{-}_{t-1}$	6.92	1.02	0.35
ΔINF^{+}	-12.93	-0.64	0.55
ΔINF^{+}_{t-1}	11.07	1.30	0.25
ΔINF^{-}	-0.11	-0.04	0.97
ΔINF^{-}_{t-1}	-1.56	-0.52	0.63
ΔFID^{+}	-0.81	-0.64	0.55
ΔFID^{+}_{t-1}	-2.83	-1.26	0.27
ΔFID^{-}	0.52	0.17	0.88
ΔFID^{-}_{t-1}	-0.74	-0.33	0.76
Cons	73.99	1.45	0.21

Source: Researchers' Computation

Table 13. Long run effects result of Profit model of Diamond Bank

Long-run effect [+]				Long-run effect [-]		
Exog. Variable	Coefficient	F-Stat.	Prob.	Coefficient	F-Statistic	Probability
Cap	-0.09	3.30	0.13	0.02	0.18	0.69
Gdp	0.07	4.96	0.08	-0.04	0.08	0.79
Intr	-0.10	0.003	0.96	2.94	0.83	0.41
Inf	-3.86	1.65	0.26	-0.40	0.75	0.43
Fid	0.29	0.34	0.59	0.03	0.002	0.96

Source: Researchers' Computation

Table 14. Long and Short runs asymmetry Result of Diamond Bank profit model and Cointegration Test

Long-run asymmetry			Short-run asymmetry		Cointegration test statistics for FCMB Model	
Wald Test	F – Statistic	Probability	F – Statistic	Probability	T_BDM	F_PSS
Cap	2.99	0.14	3.01	0.14	-2.7258	2.9609
Gdp	0.04	0.85	2.29	0.19		
Intr	0.38	0.57	2.68	0.16		
Inf	1.68	0.25	0.00	0.99		
Fid	0.62	0.47	0.67	0.15		

Source: Researchers' Computation

Table 15. Model Diagnostic Test for Diamond Bank Model

Test	Statistic	Prob	Decision
Portmanteau test up to lag 19 (chi2)	39.14	0.003	Reject H_0
Breusch/Pagan heteroscedasticity test (chi2)	0.48	0.49	Accept H_0
Ramsey RESET test (F)	32.28	0.06	Accept H_0
Jarque-Bera test on normality (chi2)	3.69	0.16	Accept H_0

Source: Researchers' Computation

Table 16. Short run NARDL Result ECO Bank Model – Dependent Variable PRT Selection – order criteria (4, 0, 1, 1, 2, 1)

Variable	Coefficient	T- Statistic	Probability
PRT_{t-1}	1.78	1.65	0.16
CAP^{+}_{t-1}	-0.01	-0.06	0.95
CAP^{-}_{t-1}	-0.12	-0.07	0.95
GDP^{+}_{t-1}	0.02	0.24	0.82
GDP^{-}_{t-1}	0.36	0.75	0.49
$INTR^{+}_{t-1}$	3.20	0.39	0.72
$INTR^{-}_{t-1}$	5.74	0.95	0.38
INF^{+}_{t-1}	0.95	0.13	0.91
INF^{-}_{t-1}	-0.41	-0.20	0.85
FID^{+}_{t-1}	1.89	1.29	0.25

FID^{-}_{t-1}	0.71	0.29	0.78
ΔPRT_{t-1}	-3.20	-3.58	0.02
ΔCAP^{+}	-0.20	-1.48	0.19
ΔCAP^{+}_{t-1}	0.01	0.07	0.94
ΔCAP^{-}	0.02	0.40	0.70
ΔCAP^{-}_{t-1}	0.03	2.97	0.03
ΔGDP^{+}	-0.07	-0.78	0.47
ΔGDP^{+}_{t-1}	-0.01	-0.09	0.93
ΔGDP^{-}	0.97	2.33	0.07
ΔGDP^{-}_{t-1}	0.34	0.60	0.57
$\Delta INTR^{+}$	9.95	2.28	0.07
$\Delta INTR^{+}_{t-1}$	2.69	0.37	0.73
$\Delta INTR^{-}$	4.87	1.53	0.19
$\Delta INTR^{-}_{t-1}$	1.54	0.52	0.63
ΔINF^{+}	-1.61	-0.15	0.89
ΔINF^{+}_{t-1}	4.89	0.78	0.47
ΔINF^{-}	-1.54	-0.69	0.52
ΔINF^{-}_{t-1}	-1.87	-0.70	0.52
ΔFID^{+}	3.77	2.97	0.03
ΔFID^{+}_{t-1}	0.40	0.23	0.83
ΔFID^{-}	-1.44	-0.74	0.49
ΔFID^{-}_{t-1}	-0.60	-0.30	0.78
Cons	-28.47	-0.32	0.45

Source: Researchers' Computation

Table 18. Long run effects result of Profit model of ECO Bank

Long-run effect [+]				Long-run effect [-]		
Exog. Variable	Coefficient	F-Stat.	Prob.	Coefficient	F-Statistic	Probability
Cap	0.01	0.004	0.955	-0.007	0.004	0.950
Gdp	-0.01	0.050	0.833	0.205	0.559	0.488
Intr	-1.80	0.149	0.716	3.231	1.15	0.333
Inf	-0.54	0.017	0.903	-0.232	0.040	0.849
Fid	-1.07	1.078	0.347	0.402	0.078	0.791

Source: Researchers' Computation

Table 19. Long and Short runs asymmetry Result of ECO Bank profit model and Cointegration Test

Long-run asymmetry			Short-run asymmetry		Cointegration test statistics for FCMB Model	
Wald Test	F – Statistic	Probability	F – Statistic	Probability	T_BDM	F_PSS
Cap	0.014	0.911	0.1107	0.753	1.6512	5.1111
Gdp	0.402	0.554	2.042	0.212		
Intr	0.055	0.824	0.697	0.442		
Inf	0.023	0.885	0.485	0.517		
Fid	0.546	0.493	4.025	0.101		

Source: Researchers' Computation

Table 20. Model Diagnostic Test for ECO Bank Model

Test	Statistic	Prob	Decision
Portmanteau test up to lag 19 (chi2)	31.61	0.003	Reject H_0
Breusch/Pagan heteroscedasticity test (chi2)	0.50	0.48	Accept H_0
Ramsey RESET test (F)	2.95	0.26	Accept H_0
Jarque-Bera test on normality (chi2)	0.48	0.79	Accept H_0

Source: Researchers' Computation

Table 21. Short run NARDL Result UBA Bank Model – Dependent Variable PRT Selection – order criteria (1, 0, 1, 1, 2, 1)

Variable	Coefficient	T- Statistic	Probability
PRT_{t-1}	-1.40	-1.73	0.14
CAP^{+}_{t-1}	0.01	0.62	0.57
CAP^{-}_{t-1}	0.04	1.35	0.23
GDP^{+}_{t-1}	-27.16	-0.21	0.84
GDP^{-}_{t-1}	549.83	1.03	0.35
$INTR^{+}_{t-1}$	6664.9	0.82	0.45

$INTR^{-}_{t-1}$	38350.5	2.84	0.04
INF^{+}_{t-1}	40784.5	3.37	0.02
INF^{-}_{t-1}	-6822.4	-3.00	0.03
FID^{+}_{t-1}	576.87	0.17	0.87
FID^{-}_{t-1}	-716.65	-0.22	0.84
ΔPRT_{t-1}	0.061	0.11	0.92
ΔCAP^{+}	-0.003	-0.26	0.80
ΔCAP^{+}_{t-1}	-0.016	-0.94	0.39
ΔCAP^{-}	0.024	1.36	0.23
ΔCAP^{-}_{t-1}	0.016	1.42	0.22
ΔGDP^{+}	-53.51	-0.44	0.67
ΔGDP^{+}_{t-1}	-46.63	-0.58	0.58
ΔGDP^{-}	430.64	0.94	0.39
ΔGDP^{-}_{t-1}	406.38	0.76	0.48
$\Delta INTR^{+}$	3448.5	0.48	0.65
$\Delta INTR^{+}_{t-1}$	4448.1	0.54	0.61
$\Delta INTR^{-}$	17757.47	3.68	0.01
$\Delta INTR^{-}_{t-1}$	-13555.85	-1.86	0.12
ΔINF^{+}	55909.27	3.67	0.14
ΔINF^{+}_{t-1}	-11434.3	-1.69	0.15
ΔINF^{-}	-1940.36	-0.53	0.62
ΔINF^{-}_{t-1}	5412.62	1.27	0.26
ΔFID^{+}	479.30	0.39	0.72
ΔFID^{+}_{t-1}	1618.48	0.69	0.52
ΔFID^{-}	-862.79	0.30	0.78
ΔFID^{-}_{t-1}	-738.74	-0.31	0.77
Cons	-122944	-2.83	0.04

Source: Researchers' Computation

Table 22. Long run effects result of Profit model of UBA Bank

Long-run effect [+]				Long-run effect [-]		
Exog. Variable	Coefficient	F-Stat.	Prob.	Coefficient	F-Statistic	Probability
Cap	0.009	0.401	0.56	-0.029	2.47	0.18
Gdp	-19.39	0.038	0.85	-392.56	0.78	0.42
Intr	4758.53	0.459	0.53	-27380.9	4.80	0.08
Inf	29118.7	3.01	0.14	4870.9	1.91	0.23
Fid	411.86	0.034	0.86	511.67	0.04	0.85

Source: Researchers' Computation

Table 23. Long and Short runs asymmetry Result of ECO Bank profit model and Cointegration Test

Long-run asymmetry			Short-run asymmetry		Cointegration test statistics for FCMB Model	
Wald Test	F – Statistic	Probability	F – Statistic	Probability	T_BDM	F_PSS
Cap	4.44	0.089	3.048	0.141	-1.7286	4.4505
Gdp	0.68	0.445	1.368	0.295		
Intr	3.72	0.112	0.1367	0.727		
Inf	2.89	0.150	8.221	0.035		
Fid	0.61	0.471	0.545	0.494		

Source: Researchers' Computation

Table 24. Model Diagnostic Test for ECO Bank Model

Test	Statistic	Prob	Decision
Portmanteau test up to lag 19 (chi2)	15.91	0.53	Accept H_0
Breusch/Pagan heteroscedasticity test (chi2)	0.13	0.72	Accept H_0
Ramsey RESET test (F)	1.81	0.38	Accept H_0
Jarque-Bera test on normality (chi2)	1.62	0.44	Accept H_0

Source: Researchers' Computation

5. Discussion of Findings

The NARDL result for Zenith bank shows that capital base impacted positively and significantly on the bank's performance. This implies that shocks in capital base was crucial in explaining performance of Zenith bank over the period. The NARDL result also indicates that capital base has positive but insignificant shocks on the performance of ECO, and UBA banks. This implies that increases in capital base of these banks spurred their performance and vice versa hence conformed with theoretical expectation. However, the NARDL shows that shock in capital base negatively and insignificantly affected performance of Diamond and FCMB banks both in the long and short run. This implies that increase in capital base of Diamond and FCMB banks retarded their performance. The results of Zenith, Eco and UBA banks are in consonance with the earlier studies by Alexiou and Sofoklis (2009), Angbazo (1997), Athanasoglou et al. (2008), Berger (1995b), Bourke (1989), García-Herrero et al. (2009), Iannotta et al. (2007) and Lloyd-Williams et al. (1994). The results from FCMB and Diamond banks are not in tandem with theoretical expectation but allied with findings from studies by Haron (2004) and Salim & Yadav (2012). Zenith, Eco and UBA banks have experienced relative stability because of their size and spread not only in Nigeria but also in the continent of Africa. FCMB, Diamond are relatively new and have undergone series of transformation due to merger and acquisition. The foregoing analysis implies that the profitability/performance of a bank is supported by a strong capital base.

Myriads of empirical evidences reveal that the instability and systemic crisis that characterised the banking sector in Nigeria was mainly attributed to inadequacy or weak capital base, culminating in the banking consolidation exercise in the nation's banking history. For instance, Zenith, Eco and UBA Banks have experienced relative stability in terms of capital base, spread (branch networks) and management over the years. These banks were also very effective in acquiring other banks in order to enlarge their own scope (Eco acquired Oceanic Bank in 2008). These developments may have influenced the significant results obtained from these banks. On the other hand, FCMB and Diamond Banks are relatively new in the financial/banking sector and have also undergone several internal reforms and restructuring over the years, due to low capital base and poor management (see Sanusi 2011).

This development may have informed the insignificant results that we arrived at via this study. The foregoing analyses are in tandem with the theoretical and empirical findings by Kanu and Isu (2013), Berger (1995) and Hughes and Mester (1997). In their studies, they have concluded that improvement in the capital base and profitability is positively and directly related to the performance of banks in Nigeria.

In addition, applying the quarterly returns and using the NARDL method for the five sample banks from the 18 financial institutions selected for the research study, the analysis for Zenith Bank shows that there exists a unique short and long-run asymmetry between profitability level and consolidation (capital base). This implies that the variable tends to move together in the long run, according to the economic theory in the literature of this work. For instance, Guru et al,(2002) found that a bank's profit decreases as the interest rate increases. They also discovered that a high price level increases the performance of banks in Malaysia. Ogowewo and Uche (2006), however, found that high inflation constrained banks performance. Tan and Floros (2012) found that an increase in GDP was inversely related to banks' profit level in China. On his path, Ting (2012) found a direct and significant link between financial development and a bank's profitability. Though the finding of Ting (2012) was not in tandem with our result in this study, the other results, by Guru et al. (2002) and Ogowewo and Uche (2006), support our findings in this study. The coefficient of determination in the analysis for Zenith Bank indicated that 99% of the total variation in profitability/performance was determined by changes in capital base, GDP, inflation, financial deepening and interest rates during the period under review. Also, Eco bank, UBA, Diamond and FCMB revealed coefficients of determination of: 94%, 84%, 57% and 78% respectively. These high coefficients of determination further corroborated the crucial roles played by the variables in explaining performance and pointed out the fact that the profitability of the banking sector in Nigeria is determined by internal and external variables, as demonstrated in the literature of this study.

However, the NARDL result for Zenith Bank, indicated that positive shocks in real GDP was positively but insignificantly linked to the bank's performance, both in the short and long run effect. The positive shock in real GDP in the FCMB's model also led to a positive but insignificant effect on profitability. A

consistent result (sign) of positive and insignificant impact of positive shock was also evident in the Diamond and Eco Banks' models for the real GDP. The UBA and Eco bank's models were, however, found to have negative effect of positive shock in real GDP both in the long run and short run. Though real GDP was found to have an insignificant asymmetry in all the five models, the mixed effects of this variable showed that real income had diverse impacts on the performance of banks in Nigeria. Evidences in literature also show these mixed implications, for instance, Schumpeter (1934); Goldsmith (1969); Mckinnon (1973); Shaw (1973); Ndege (2012) and Levine (2004) have all provided empirical evidence of positive links between real GDP and performance of banks. However, the findings in the study carried out by Tan and Floros (2012) pertaining to the Chinese banking sector reveals that GDP and performance are inversely related.

The NARDL result for Zenith Bank model was mixed. In this case, positive and negative shocks in inflation was found to be positively but insignificantly affected Zenith Bank's performance. The result was also same for FCMB's and UBA's models, with positive and negative shocks in price level translating to positive effect on profitability of the bank both in the long and short runs. The result of the NARDL for Diamond Bank showed that shocks (positive and negative) in inflation rate had a negative and insignificant effect on profitability of the bank both in the short and long runs. The result for Eco banks shows that both negative and positive shocks in price level have negative effect on performance of the banks in the short and long run effects. This negative relationship between inflation and profitability is supported in the literature by CBN 1994; Afolabi and Oluyemi (1995); Uche (2006) and Ogowewo and Uche (2006). Their conclusions were theoretical in nature, and are now supported by our empirical results. They observed that the high price level in the Nigerian economy reduces demand for banks' financial assets, leading to a situation of diversion of deposit to other sectors of the economy, such as real estate, and further preventing the banking sector from performing its role as a financial intermediator.

The result of our analysis using the NARDL indicated that shocks in financial development have negative effect and insignificant implication on the performance of Zenith Bank's model. The result of the NARDL model for FCMB was, however indicated that positive shock in financial development

had positive and insignificant effect on long run and short performance of FCMB while the negative shock retarded the performance of the bank. For the Diamond Bank's model, shocks in financial deepening was found to have positive and insignificant impact on the bank's performance in the long run while in the short run, shocks in financial development had both positive and negative effects on the performance of the bank. Positive shock in financial deepening had a negative effect on the performance of Eco bank while a negative shock had positive effect on its performance in the long run. In the short run, shocks in financial development led to positive effect in performance of Eco bank except at lag 1. In the UBA model, positive and negative shocks in financial deepening have positive but insignificant effect on the performance of the bank in the long run while in the short run, positive shock has positive effect on performance while negative shock has negative and insignificant effect on the bank's performance during the period of this study. Most of the works reviewed in the literature appeared to conformed with our results that showed a positive relationship between financial deepening and bank performance. For instance, the studies by King and Levine (1993); Khan and Senhadji (2000) and Ting (2012) in the literature, revealed a direct relationship between financial deepening and profitability/performance.

NARDL result for interest rate shows that it has positive effect on the performance of Zenith bank while a negative shock in interest retarded its performance in the long run. In the short run, shocks in interest rate have positive effect on zenith bank's performance. The positive effect of shock in interest rate on performance is in agreement with the results of the works of Bourke (1989), Claeys and Vander Vennet (2008), DemirguçKunt and Huizinga (1999), García-Herrero et al. (2009), Molyneux and Thornton (1992), and Staikouras and Wood (2003). In Eco Bank's model, the positive shock in interest rate has negative effect on performance of the bank while a negative shock has positive effect on Eco's bank performance but insignificantly in the long run. However, in the short run, both positive and negative shocks have positive impact on the performance of the bank. The result of the NARDL method for UBA, indicated a positive effect of positive shock in interest result and a negative effect of negative shock in the bank's performance in the long run. However, in the short run, shocks in interest rate

led to positive effect on profitability of UBA. For Diamond bank, positive shock in interest rate has negative effect on performance while negative short stimulated the bank's performance in the long run but in the short shocks in interest rate stimulated the performance of Diamond bank. The FCMB's model shows that shocks in interest rate have negative effect in performance of the bank in the long run. In the short run, positive shock in interest rate led to negative effect while negative shock in interest rate led to positive effect on FCMB's performance over the period of the study. Though Trujillo-Ponce (2010) argued that a stable macroeconomic and financial environment of low interest rates coupled with tense competition among banks could reduce the possibilities for banks to establish appropriate prices for their loans and deposits, thereby putting pressure on the cost of operation and negatively affecting banks' profitability. This shows that Interest rate has serious implication on volume of liquidity banks give out as loan. However, most of the works reviewed indicate evidence of positive nexus between interest rate and profitability of banks (see; Bourke (1989), Claeys and Vander Vennet (2008), DemirguçKunt and Huizinga (1999), García-Herrero et al. (2009), Molyneux and Thornton (1992), and Staikouras and Wood (2003). Higher lending rates tend to spur profitability in the short run as banks can earn higher income at higher lending rates. However, it is difficult for banks to sustain gains using such a step as it could drive away customers and investors.

The results of the five bank's models, analysed using the NARDL, indicated that the five models adjusted speedily to long-run dynamics given the significance of the NARDL bound test statistic for all the five bank's models. This implies that capitalisation had long-run implications on the performance of DMBs in Nigeria over the period under investigation. however, both short run and long asymmetry was absent in all the variables and models except for capital base in the Zenith bank's model which shows evidence of both short and long run asymmetry.

The high coefficient of determination in all the five banks' models investigated, Zenith bank 99%, Eco bank 94%, UBA 81%, FCMB 78% and Diamond bank 57% also revealed the collective strong implication of consolidation on the performance of banks in Nigeria over the period of this study. The import of the foregoing result and analysis is that profitability/performance was explained significantly by variation in capital

base, financial deepening, GDP, interest rates and inflation in Nigeria over the period.

6. Concluding Remarks

Based on the above findings, the study concludes that: The capital base of DMBs in Nigeria had serious implications on profitability of the banking sector but such impact differs among the banks over the period 2001-2015. Financial development (financial deepening) contribution to the performance of the banking sector in Nigeria was marginal at the sectoral level but differs across individual banks over the period of this investigation. In addition, increase in the national income contributed less to the profitability of DMBs at the sectoral level but its impact on individual banks differs during the period of this study. Furthermore, the cost of credit had less impact on the profitability of DMBs both at the sectoral level and individual bank's over the period of this study. Capital base was crucial in enhancing/promoting the performance of banks that went through the consolidation process without merging or acquiring others. e.g Zenith Bank. Capital base had higher propensity for increasing the performance of DMBs in Nigeria over the period of this investigation. Positive shock in inflation rate had mixed but insignificant effect on the performance of the banking sector, meaning that increases in the price level in the short-run spurred investments and production activities during the period of study. Banking sector consolidation is crucial for the growth and development of any economy. The study shows that collapse of the banking sector also leads to the collapse of an economy, with the implication that the banking sector is an integral part of the overall economy of any nation. The banking sector performs better and more efficient in an oligopolistic environment. This position is true in the Nigeria experience and also akin to other banking jurisdictions including West Africa, USA, Asia and UK. Finally, this investigation showed that Unity Bank Plc and UBA performed better with improved capital base than other banks, while Union and Heritage Banks performed abysmally with higher capital base during deregulation than during regulation in Nigeria. Based on these findings, the study recommends: periodic upward review of bank's capital base in order to enhance performance.

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PUBLIC SECTOR SPENDING AND AGRICULTURAL SECTOR PERFORMANCE IN NIGERIA: A DISAGGREGATED APPROACH

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Abstract

Agriculture plays an important role in the development of a country's economy. However, the functioning of the sector in Nigeria has been disappointing. It is being argued that the poor functioningof the agricultural sector in Nigeria is as a result of government neglect, especially, in terms of funding. This study therefore, investigated the effect of government spending on the functioning of the agricultural sector in Nigeria. The study disaggregated total government spending on agriculture into its recurrent and capital components. Annual data from 1986 to 2017 were used. The data were obtained from Central Bank of Nigeria Annual Statistical Bulletin for 2017 and Central Bank of Nigeria Annual Report and Statement of Accounts (various years). A variety of analytical techniques including Augmented Dickey-Fuller (ADF) unit root test, Johansen cointegration test, and Error Correction Mechanism (ECM) was applied. The main conclusion from the study is that there exist a long-run equilibrium relationship between public sector spending and agricultural sector functioning in Nigeria. It is recommended that the government should increase its budgetary allocation (especially capital spending) to the agricultural sector.

Keywords: Public sector, spending, agriculture, capital, recurrent.

1. Introduction

Agriculture plays animportant role in the advancement of a country's economy. The importance of the agricultural sector in the advancement process can be assessed in terms of provision of food, job creation, provision of raw materials for industrial use, foreign exchange earnings, improvement in GDP, etc (Wilson, 2003).

Before independence in 1960, and throughout the first post-independence decade, the agrarian sector was the stronghold of the Nigerian economy. The discovery of crude oil in 1956, and consequently, the oil boom of the mid-1970s, practically sniffed life out of the sector. Attention was therefore shifted from the sector and this marked the beginning of the deficientfunctioning of the once vibrant agricultural sector in Nigeria (Anyanwu, Oyefusi, Oaikkenan and Dimowo, 1997).

Although it is argued that inadequate government attention (i.e., deficient funding) is largely responsible for the deficientfunctioning of the agricultural sector in Nigeria, various governments have embarked on several programmes and projects targeted at revamping the sector. Notable among these are: the National Accelerated Food Production Project (NAFPP); the Nigerian Agricultural and Co-operativeBank (now Bank of Agriculture); the River Basin Development Authorities (RBDAs); Operation Feed the Nation (OFN); the Green Revolution programme, the Agricultural Credit Guarantee Scheme Fund (ACGSF); the Agricultural Development Projects (ADPs); the establishment of agricultural research centres, etc (Anyanwu, Oyefusi, Oaikhenan and Dimowo, 1997 and Anyanwuocha, 2006).

In spite of the fact that huge sums of money have been spent on these programmesand projects over the years, the functioning of the sector keep deteriorating. This seems to suggest that such spendings were not adequate as they failed to improvesignificantly on the functioning of the sector. There is therefore the need to investigate, empirically, the effect of government outlay on the functioningof the sector. This study thereforestudied the effect of government spending on agriculture through the functioningof the sector. Specifically, the study studied the effects of government capital spending, government recurrent spending and inflation on agricultural production in Nigeria. Inflation was introduced as a check variable. The rest of the paper is organized as follows: section two focuses on literature review. Section three discusses the research methodology, section four takes care of data estimation and discussion of findings while in section five we conclude the work and give recommendations.

2. LITERATURE REVIEW

2.1 Conceptual Framework

2.1.1 Agricultural Sector Performance in Nigeria: An overview

After independence, the role of agriculture in the Nigerian economy, especially in terms of its contribution to total GDP, has being on a downward trend. Available data from the Central Bank of Nigeria show that the share of agriculture in total GDP was 63% in 1960. It declined to 47% and 20.16% in

1970 and 1980 respectively. The input of the sector to total GDP however increased from 20.16% in 1980 to 31.5% in 1990. It thereafter declined to 26.3%, 23.89% and 21.06% in 2000, 2010 and 2017, respectively.

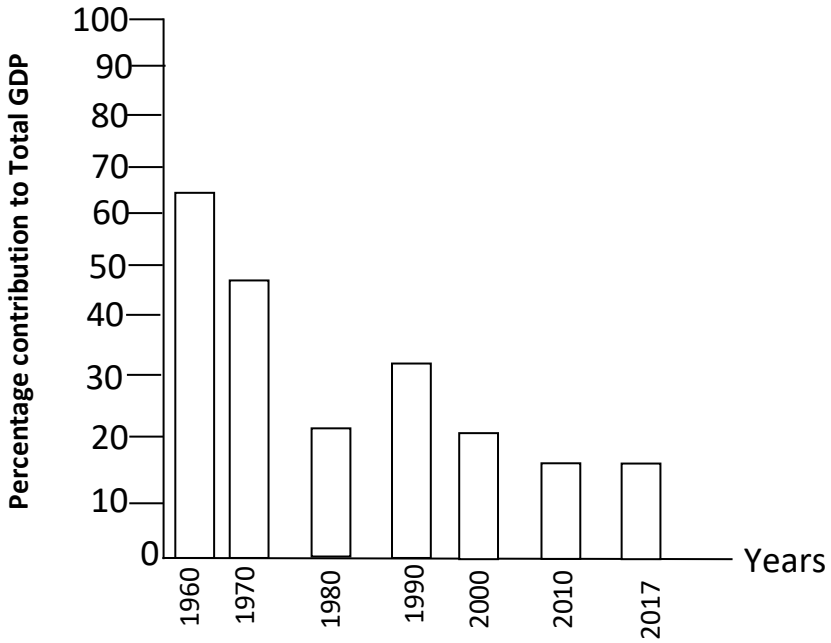
Table 2:1: Contribution of Agriculture to Nigeria's Total GDP

Year	Agricultural GDP (₦B)	Total GDP (₦B)	% of total GDP
1960	1.41	2.2	63
1970	2.6	5.3	47
1980	10.0	49.6	20.16
1990	84.3	267.6	31.5
2000	1192.9	4582.1	26.03
2010	13048.89	54612.26	23.89
2017	23952.55	113711.63	21.06

Source: Central Bank of Nigeria

Table 2.1 above can be shown graphically as displayed in fig. 2.1 below:

Fig 2.1: Percentage Contribution of Agriculture to Nigeria's Total GDP



Source: Central Bank of Nigeria

The observed downward pattern of the share of agriculture in Nigeria's total GDP may be attributed to the economic advancement doctrine which specifies that, in the course of economic advancement, the share of agriculture to national production declines while that of the manufacturing and service sectors increases (Todaro and Smith, 2011). While this doctrine may be theoretically possiblein the course of economic progress, there are other reasons which explain this downward trend in Nigeria. In fact, according to Anyanwu, Oyefusi, Oaikhenan and Dimowo (1997), the dominance of crude oil in the GDP and the dwindling efficiency of the agricultural sector offer better explanations for the observed trend in Nigeria.

Furthermore, analysis of the composition of the agricultural sector by economic activities shows that crop production remains the dominant sub-sector followed by livestock, fishery and forestry. Available data also indicate that the contribution of crop production to total agricultural production has been largely on an upward trend from 1960 to 2017. On the other hand, the contribution of forestry to total agricultural production hasbeen largely on a downward trend from 1960 to 2017 while those of livestock and fishery have been fluctuating. This is shown in table 2.2 below

Table 2.2Agriculture Production by Activity in Nigeria (1960-2017)

Year	Crop Production		Livestock		Forestry		Fishery	
	Production (₦B)	% of total agricultural production	Production (₦B)	% of total agricultural production	Production (₦B)	% of total agricultural production	Production (₦B)	% of total agricultural production
1960	1.13	80.14	0.12	8.51	0.13	9.22	0.03	2.13
1970	1.97	75.77	0.18	6.92	0.15	5.77	0.28	10.77
1980	6.61	66.10	1.87	18.7	0.31	3.1	1.21	12.1
1990	68.41	81.13	9.56	11.34	2.14	2.54	4.21	4.99
2000	1000.07	83.83	116.39	9.76	22.45	1.90	54.01	4.53
2010	11683.9	89.54	979.56	7.51	135.72	1.04	249.71	1.91
2017	21096.11	88.08	1974.45	8.24	257.21	1.07	624.79	2.61

Source: Central Bank of Nigeria

Note: 1960 to 1980 figures were based on 1994 constant basic prices while 1990 to 2017 were based on 2010 constant basic prices.

2.1.2 Government Expenditure on Agriculture

In Nigeria, total government outlay is normally divided into capital and recurrent spending. Available statistics show that, from 1986 to 2017, more money has been allocated to capital expenditure on agriculture than its recurrent counterpart. In absolute terms, total government outlay (the sum of capital and recurrent spending) has largely been increasing. As a percentage of total government spending, total spending on agriculture have been fluctuating. Total government spending on agriculture, as a percentage of total government spending, increased from 2.4% in 1986 to 3.07% in 1990. It however decreased to 1.58% in 1995 and thereafter increased to 2.16% and 4.21% in 2000 and 2005 respectively. It declined marginally to 40.03% in 2010 and then dropped abruptly to 2.31% and 1.52% in 2015 and 2017 receptively. This is shown in table 2.3 below.

Table 2.3: Federal Government Expenditure on Agriculture in Nigeria

Year	GCEA (₦B)	GREA (₦B)	TGEA (₦B)	TGE (₦B)	TGEA as a % of TGE
1986	0.37	0.02	0.39	16.22	2.4
1990	1.59	0.26	1.85	60.27	3.07
1995	2.41	1.51	3.92	248.77	1.58
2000	8.80	6.34	15.14	701.05	2.16
2005	60.30	16.33	76.63	1822.10	4.21
2010	140.70	28.22	168.92	4194.58	4.03
2015	73.90	41.27	115.17	4988.86	2.31
2017	83.0	43.50	126.5	8302.10	1.52

Source: CBN Annual Reports and Statements of Accounts (various years)

Note: GCEA = Government Capital Expenditure on Agriculture
GREA = Government Recurrent Expenditureon Agriculture
TGEA = Total Government Expenditure on Agriculture
TGE = Total Government Expenditure

2.1.3 **Rationale for Government Intervention in Agriculture**

In almost every country, governments intervene in the agricultural sector. Such interventions include subsidies to farmers; imposition of taxes on farmers' income, provision of food subsidies for urban dwellers, support for the use of fertilizers; provision of irrigation schemes; provision of extension services; marketing control and price stabilization, etc (Anyanwu et al, 1997). These programmes of intervention generally impose enormous financial burden on the government and cause allocation inefficiencies, especially, in impoverished countries (Stiglitz, 1987). In spite of this, governments in LDCs embark on these programmes for certain reasons. In fact, the reasons for government intervention in a country's agriculture are not much different from the reasons for general government intervention in the economy. Stiglitzs (1987) outlines five major reasons for government intervention in the agricultural sector as follows:

i. ***Imperfections in insurance and credit markets:*** It is difficult for farmers in developing countries to get complete insurance against both production and price risks. Informal credit markets, like agricultural insurance markets are characterized by a great deal of imperfection. Rural farmers generally have limited access to credit facilities due to high interest rates.

ii. ***Public goods and increasing returns***: These creategood reason for government to provide some projects that have the features of public goods for example, water irrigation projects. In most cases, the incremental cost of using irrigated water, once the dam has been built, is relatively low, and the cost of monitoring water usage is relatively high. Water projects therefore have the features of pure public goods and they are better provided by the government (Ahuja, 2013).

iii. ***Imperfect information***: Farmers in developing countries are generally deficient and therefore, have limited access to information that can enhance efficiency. Disseminating such information may be very costly if left in private hands. This therefore provides the rationale for government provision of extension services to farmers in the LDCs.

iv. ***Externalities***: The successful acquisition of a new technology by one farmer gives important information to other farmers. This gives them a huge externality. The presence of this externality provides justification for government subsidies to farmers to acquire new technologies.

v. ***Income distribution***: This is perhaps the most important reason for government intervention in agriculture. It has to do with the distribution of income generated by the market which, if left unfettered, may not satisfy society's ethical standards. Specifically, it may results in greater proportion of the citizens having unacceptable low income or supplies of food. It is therefore necessary that government introduce programmes that enhance the incomes of small farmers and provide food subsidies for the urban impoverished.

2.2 **Theoretical Literature Review**

Several theoretical models have been developed to explain the forces in the environment, society and the economy that lead to agricultural growth and advancement. These models include: the conservation model, the urban-industrial effect model, the diffusion model, and the high payoff input model. However, for the present study, we adopt the high payoff input model as our theoretical basis. This is because it is the most suitable. Besides, based on its general interpretation, the high payoff input model embraces the main themes of the other three models (Schultz, 1964).

The high payoff input modelwas formulated during the 1960s as another option to address the deficiency of strategies based on the conservation, urban-industrial impact, and diffusion models. The main point of the model is that, the way to turning conventional agriculture to a reasonable source of growth is investment focused on making modern high outcome inputs accessible to farmers in LDCs (Schultz, 1964). As indicated by the theory, workers in traditional agrarian system were viewed as economical and proficient asset allocators. However, they were deficient in light of the fact that, in most poor nations, there were little opportunities open up for them (Hayami and Ruttan, 1971).

As indicated by Ruttan (1977), the high payoff input theory can be categorized into three variations: (i) the ability of public and private sector research institutions to provide new technical knowledge; (ii) the ability of the industrial sectors to create and market new technical inputs; and (iii) the ability of farmers to get new information and utilize new data sources productively. Therefore, the unique implications of the theory for agricultural enhancement approach are the significance placed on accelerating the procedure of advancement and use of new inputs through public investment in research and education.

2.3 **Empirical Literature Review**

Some of the studies conducted on the relationship between government spending and agricultural sector functioning, and other related issues are reviewed in this section.

Selvaraj (1993) studied the effectof government spending on the output of the agricultural sector in India. The study applied Chow stability test on annual time – series data covering 1951 to 1989. The results showed a significant positive effect of agricultural government spending on agricultural sector functioning. The Chow test showed that the instability in government spending negatively affects agricultural productionprogression.

Saungweme and Matandare (2014) analyzed the effect ofgovernment spending on agriculture on agricultural sectorfunctioning, and its subsequent effect on the economy of Zimbabwe. The study applied ADF and Philips Perron unit roottests, and ordinary least squares (OLS) techniques on annual data for the period 1980-2005. The findings showed that government agriculture spending boost agricultural functioningand then effects positively on the economy.

Anriquez, Foster, Ortega, Falconi and De Salve (2016) studied the effect of public outlay on agriculture on the functioning of the agricultural sector of 19 Latin American and Caribbean countries for the period 1985-2012. The study applied panel data approach to fixed and random effects on United Nations FAO data for the 19 countries. The outcome of the study showed that total government spending on agriculture has strong direct effect on agricultural sector functioning.

Nwabutwa (2017) investigated the effect of government agriculture costs on agricultural efficiency in Malawi with a reduced form production function using panel data for 26 Malawi's districts. The data period covered 2005 to 2014. The findings showed that increasing the level of government spending on agriculture across the districts increases agricultural efficiency.

Applying structural vector autoregressive (SVAR) model on quarterly time-series data from 2001:Q1 to 2016:Q2, Shevchukand Kopych (2017) studied the effects of fiscal policy on agriculture and industry in Ukraine. Specifically, the study studiedthe effect of public costs on agrarian and industrial production in Ukraine. The effectof the data analysis showed that public costs contributes strongly to both agricultural and industrial productionprogression.

In Nigeria, Udoh (2011) studied the nexus between public agricultural spending, private sector investment in agriculture and agricultural sector progression. Annual time – series data covering the period 1970 to 2008 were used. Through the application of ARDL Bound testing, the results showed that public outlayon agriculture has positive effect on agricultural production. Similarly, Iganiga and Unemhilin (2011) analyzed the effect of government spending on agriculture on agricultural production in Nigeria using annual time-series data from 1970 to 2008. The study applied ADF and Phillips–Perron unit root tests, Augmented Engle – Granger (AEG) cointegration test and ECM on a Cobb-Douglas production model. The results showed that government agricultural outlay has positiveeffect on agricultural production.

Applying a variety of econometric techniques on annual data from 1980 to 2011, Okezie, Nwosu and Njoku (2013) studied the effect of government spending on agriculture on the contributionof the sector to Nigeria's GDP. The outcome of the study showed a weak effect of government spending on agricultural GDP.

In a related study, Ele, Okon, Ibok, and Brown (2014) studied the effect of government agricultural capital outlay on the contribution of agriculture to economic progression in Nigeria. Annual time-series data from 1961 to 2010 were employed. ADF unit root test, Johansen cointergration test, ECM and Granger causality test were the analytical techniques applied. The findings showed that agricultural capital outlay has a positive effect on the contribution of agriculture to economic progression. The Granger causality test showed a

unidirectional causality from government agricultural capital costs to agricultural economic progression.

Okoh (2015) studied the role of fiscal policy in the functioning of agriculture in Nigeria using time-series data from 1981 to 2013. The study applied a variety of analytical techniques including ADF unit root test, Johansen cointegration test and error correction mechanism. The outcome of the study indicated an inverse relationship between agricultural government spending and agricultural progression.

Zirraand Ezie (2017) applied the fully modified OLSregression technique on annual data from 1995 to 2014 to capture the effects of fiscal policy on agricultural production in Nigeria. An important aspect of the study is that it disaggregated total government spending on agriculture into its recurrent and capital components. The main findings from the study is that while government capital costs has a direct but weak effect on agricultural production, recurrent costs has a strong directeffect on agricultural production. Finally, Ogboru, Abdulmalik and Park (2018) studied the effect of government spending on agriculture on unemployment in Nigeria. Annual time-series data from 1999 to 2015 were used. Through the application of autoregressive distributed lag (ARDL) model, the study showed that government spending on agriculture has no significant effecton unemployment reduction.

2.3.1 **Summary of Literature Reviewed**

In the review of related literature, we studied both theoretical and empirical literatures. In the theoretical literature, we reviewed the high payoff input model which is the theoretical basis for the study. In the empirical literature, studies that were done both in and outside Nigeria were studied. While some of the studies established either strong or weak positive relationships between agricultural government spending and agricultural sector functioning, others showed either an inverse or no significant relationship.

An important observation made from the empirical literature review of studies conducted on Nigeria is that, only Zirra and Ezie (2017) disaggregated government spending on agriculture into recurrent and capital outlays. However, the dataset used by Zirra and Ezie (2017) covered the period 1995 to 2014 (20 years). Our argument therefore, is that, this period is too short and

not up to date. To fill this gap, the present study disaggregated total government spending on agriculture into recurrent and capital outlays. This study also used data from 1886 to 2017 (i.e. 32 years). This data set is wider in scope and up to date than the one used by Zirra andEzie (2017). It therefore reflects current realities of the phenomenon being investigated.

3. Methodology

3.1 Nature and Sources of Data

This study made use of annual time-series data from 1986 to 2019. The data were obtained from Central Bank of Nigeria 2017 Annual Statistical Bulletin and Central Bank of Nigeria Annual Reports and Statements of Account for various years.

3.2 Techniques and Procedures for Data Estimation

The ordinary least squares (OLS) regression technique was used to estimate the time-series data. Our choice of OLS was based on certain desirable characteristics that its estimates possess (Koutsoyiannis, 2001). However, because of the peculiar problems associated with time-series analysis (i.e., non- stationarity and spurious regression), the OLS regression was preceded by some diagnostic tests such as: unit root test, Johansen cointegration, error correction mechanism and Granger causality test.

The unit root test was conducted using the Augmented Dickey - Fuller (ADF) unit root test. In practice, to account for the three different possibilities of random walk, the ADF test can be estimated using three different models. These are:

$$\Delta Y_t = \delta Y_{t-1} + \Sigma \alpha_i \Delta Y_{t-1} + \varepsilon_t \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad 3.2.1$$

$$\Delta Y_t = \beta_1 + \delta Y_{t-1} + \sum_{i=1}^{m} \alpha_i \Delta Y_{t-1} + \varepsilon_t \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad 3.2.2.$$

$$\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_{t-1} + \sum_{i=1}^{m} \alpha_i \Delta Y_{t-1} + + \varepsilon_t \quad \ldots\ldots\ldots\ldots \quad 3.2.3.$$

where ε_t is a pure white noise error term.

Equations 3.2.1, 3.2.2, and 3.2.3 represent random walk without drift, random walk with drift, and random walk with drift and deterministic trend respectively.

3.3 Model Specification

The model used for the study was specified as follows:
The mathematical form of the model is stated as:

AGO = f (GCEA, GREA, INFR) …`……. 3.3.1

where AGO = Agricultural Production
GCEA = Government Capital Expenditure on Agriculture
GREA = Government Recurrent Expenditure on Agriculture
INFR = Inflation Rate
F = Functional Notation

AGO is the dependent variable while GCEA, GREA and INFR are the explanatory variables.
The OLS linear regression equation based on the above functional relation is:

$AGO = \beta_0 + \beta_1 GCEA + \beta_2 GREA + \beta_3 INFR + U$ ……. 3.3.2

where β_0 is the regression constant, β_1, β_2 and β_3 are the regression coefficients, and U is the random variable. Every other terms are as earlier defined.

A logarithmic transformation of equation 3.3.2 above gives us:

$LOGAGO = \beta_0 + \beta_1 LOGGCEA + \beta_2 LOGGREA + \beta_3 INFR + U$ ……3.3.3

where LOG is the natural logarithm of the variable where applicable.

3.3.1 A Priori Theoretical Expectations

Based on economic theory, we expect the following signs of the coefficients of the individual parameter estimates:

$LOG\ AGO = \beta_0 + \beta_1 LOGGCEA + \beta_2 LOGGREA + \beta_3 INFR + U$

$(\beta_1 > 0,\ \beta_2 > 0,\ \beta_3 < 0)$

4. Presentation of Results and Discussion of Findings

4.1 Augmented Dickey – Fuller (ADF) Unit Root Test Results

The result of the ADF unit root test is presented in table 4.1 below

Table 4.1 ADF Unit Root Test Result

Variables	**ADF Statistics**	**Critical Value 10%**	**Critical Value 50%**	**Prob**	**Order of Integration**
LOG (AGO)	-5.392854	-3.670170	-2.963972	0.0001	I (1)
LOG (GREA)	-7.754709	-3.670170	-2.963972	0.0001	I (1)
LOG (GCEA)	-5.703322	-3.670170	-2.963972	0.0001	I (1)
INFR	-4.5025671	3.737853	2.991878	0.0017	I (1)

Source: Author's Computation from E-view Results

From table 4.1 above, the result of the ADF unit root test shows that none of the series were stationary at levels. They were however all stationary after talking their first differences.

4.2 Johansen Cointegration Test Result

The effect of the Johansen Cointegration test is presented in table 4.2 below. The Trace Statistic and the maximum Eigen statistic wereused to interpret the results.

Table 4.2 **Johansen CointegrationTest Results**

Hypothesized No. of CE(s)	**Trace Statistic**	**0.05 Critical Level**	**Prob****
None*	56.30178	47.85613	0.0066
At most 1	25.344459	29.79707	0.1495
At most 2	10.77842	15.49571	0.2255
At most 3	2.944585	3.841466	0.0862
Hypothesized No. of CE(s)	Max-Eigen statistic	0.05 Critical Level	Prob**
None*	30.96719	27.58434	0.117
At most 1	14.56617	21.13162	0.3205
At most 2	7.833837	14.26460	0.3958
At most 3	2.9446585	3.841466	0.0862

Source: Author's computation from E-views Result.

Trace test indicates 1 cointegrating equation at the 0.05 level.

Max – eigentest indicates 1 cointegrating equation at the 0.05 level.

**denotes rejection of the hypothesis at the 0.05 level*

*** Mackinnon – Haug – Michelis (1999) p-values*

From table 4.2 above, both the Trace statistic and the Max-Eigen value indicate 1 cointegrating equation. This indicates the existence of an equilibrium relationship between the dependent variable (LOG (AGO)) and the explanatory Variables (i.e., LOG(GREA), LOG (GCEA), and INFR).

4.3 Error CorrectionMechanism (ECM) Result

The result of the ECM is shown in table 4.3 below.

Table 4.3 ECM Result

Dependent variable: LOG (AGO)
Method: Least Squares
Date: 02/04/19 Time: 07:23
Sample adjusted: 1988 2017
Included observations: 30 after adjustments

Variable	Coefficient	Std Error	t-statistic	Prob
C	8.246966	0.071400	115.5033	0.0000
LOG (GCEA)	0.011644	0.028961	0.402075	0.6921
LOG (GCEA)	0.294822	0.031403	9.388291	0.0000
LOG (GCEA (-1)	0.022807	0.027869	0.818353	0.4233
LOG (GREA)	0.002238	0.018161	0.123217	0.9032
LOG (GREA (-1)	0.025034	0.018679	1.340229	0.1960
LOG (GREA (-2)	0.004493	0.021670	0.207333	0.8380
INFR	-0.000164	0.001111	-0.148050	0.8839
INFR (-1)	-0.000804	0.001144	-0.703031	0.4906
INFR (-2)	-0.001394	0.001064	-1.309959	0.2058
ECM (-1)	-0.854549	0.066750	-12.80228	0.0000
R-squared	0.692688	Mean dependent var		8.885183
Adjusted R-squared	0.688840	S.D. dependent var		0.603019

S.E. of regression	0.063703	Akaike info criterion	-2.392591
Sum squared resid	0.077104	Scharz criterion	-1.878818
Log likelihood	46.88886	Hannan-Quinn Criter	-2.228230
F-statistic	257.9591	Durbin – Watson stat	2.223990
Prob (F-statistic)	0.000000		

Source: Author's computation from E-views Results

From table 4.3 above, the result of error correction mechanism shows that the error correction term (ECM(-1)) turned up with an expected negative sign. The ECM (-1) coefficient of -0.854549 indicates a speed of adjustment of about 85 per cent from short-run disequilibrium to long-run equilibrium. The short-run regression result shows that LOG (GCEA) has a positive but insignificant relationship with agricultural production (LOG(AGO)) at the 0.05 significant level. However, government capital costs on agriculture lagged by one period (LOG(GCEA(-1)) has a significant positive relationship with agricultural production. LOG (GCEA (-2) showed a positive but insignificant relationship with LOG (AGO). Also, government recurrent costs on agriculture (LOG(GREA)) has direct but insignificant relationship with agricultural production. Similarly, government recurrent costs at both lag1 and lag 2 (i.e., LOG (GREA(-1) and LOG (GREA(-2)) both showed insignificant positive relationship with agricultural production. On the other hand, inflation displayed a negative insignificant relationship with AGO.

In the same vein, INFR (-1) and INFR (-2) indicated negative and insignificant relationship with AGO. The above results showed that all the explanatory variables are correctly signed.

The short-run result also showed that the coefficient of multiple determinations (R^2) is 0.692688. This implies that all the explanatory variables jointly account for about 69 percent of the total variations in the dependent variable AGO. Similarly, the F-statistic is 257.9591 with prob (F-statistic) of 0.000000. Hence, the overall model is statistically significant at 0.05 level of significance.

Finally, the Durbin-Watson statistic of 2.223990 indicates the absence of autocorrelation of the error term.

5 Conclusion and Policy Recommendations

5.1 Conclusions

This study analyzed the effect of public sector spending on agriculture on the functioning of the agricultural sector in Nigeria. From the findings of the data analysis, the following conclusions were drawn.

i. There is a long-run relationship between government spending on agriculture and the agricultural sector functioning in Nigeria.
ii. Government capital outlay on agriculture has a significant direct relationship with agricultural production in Nigeria in the short-run.
iii. Government recurrent outlay onagriculture has a short-run inverse but insignificant effect on agricultural production in Nigeria.
iv. In the short-run inflation has a negative but insignificant effect on agricultural production in Nigeria.

5.2 Recommendations

From the findings of the study, we therefore recommend as follows:

i. Government capital budgetary allocation to the agricultural sector should be increased. This will ensure that more money is available to provide the necessary infrastructure that will enhance the efficiency of the agricultural sector.
ii. The provision of agricultural subsidies to farmers will no doubt boost the functioning of the sector. To this end, the government should increase its subsidies on essential agricultural inputs to farmers.
iii. Government should increase its funding of those key institutions and agencies of government whose core mandate is to enhance the efficiency of the agricultural sector. Hence such institutions like the Bank of Agriculture; the Agricultural Credit Guarantee Scheme Fund, the various agricultural research institutes, etc should be revitalized through adequate funding.

iv. The setting up of government demonstration farms and properly funded agricultural extension programme will no doubt contribute to improving the functioningof the agricultural sector in Nigeria.

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CLIMATE CHANGE AND AGRICULTURAL PRODUCTIVITY IN NIGERIA

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Abstract

The study investigated climate change and agricultural productivity in Nigeria using secondary data spanning from 1986 – 2016. The ordinary least square (OLS) estimation technique was used to check the relationship existing between the Agricultural sector output, as the dependent variable and Annual Average Temperature (AVT), Annual Average Rainfall (ARF) and Annual Average Sunshine Level (ASL) as independent variables. The Unit root test revealed that all variables became stationary after first differencing; the Johansen Co-integration test revealed a long run equilibrium relationship among the variables employed; the parsimonious ECM Test was rightly signed and 28 percent disequilibrium is corrected annually. The study showed a relationship between climate change variables and agricultural productivity in Nigeria with the coefficients of AVT and ASL conforming to a priori expectations while ARF did not. The stability test revealed a long run stability of the variables employed and can therefore be used for policy analysis. Based on findings, it is recommended that there is a need to intensify effort on climate change enlightenment campaign, innovative agricultural strategies are required to augment the shortage of rainfall while a national economic plan to take into cognizance futuristic expected climate change impacts and how to deal with it should be implemented.

Keywords: Climate Change, Unit Root Test, Cointegration ECM and Productivity

1. Introduction

In recent years, there has been increasing concerns over the output and productivity level of agricultural products in the face of climatic changes. The concern stems from the fact that shortage of food could constitute a serious problem to the sustainable development of an economy as agriculture has remained man's only source of food. In Nigeria, the level of awareness of climate change among Nigerians is low and it is likely to continue if no intervention measures are taken (Anslem & Taofeeq, 2010). Climate change involves a significant change in the statistical distribution of weather pattern over an extended period of time that alters the composition of global atmosphere. These thus include all forms of change in the known atmospheric conditions of a place. While scholars have agreed that the climate is changing, there has been varying views on the causes of this change and it has been posited that both natural actions and human activities contributes to the

climatic changes. Changes in climate are of negative impact on agricultural production in many African countries. Such incidents as drought, erosion, excessive rainfall, extreme temperature, rising sea levels and water scarcity affect agricultural production. No doubt, the world has experienced increase in population growth rate over time, it thus has been posited accompanying economic growth globally is population growth with both growth seen as the most important drivers of increases in CO_2 emissions from fossil fuel combustion (IPCC, 2007). From 3.032 billion in 1960 the world's population increased to 6.122 billion in 200 and stood at 7.53billion in 2017 (World Bank Group, 2018).This increase in population means the earth which is the habitat of the increasing population is experiencing more human activities as the days go by.

Agriculture on the other hand, essentially lies at the heart of importance for all economies worldwide. This is so because the most central aim of all nations is feeding her continually growing populace. As such, no other economic sector is more vital to safeguarding human livelihoods as it globally provides employment for about 2.6 billion people worldwide and accounts for 20 to 60 percent of the gross domestic product of many developing countries. The agricultural sector in Nigeria is seen as a major sector and a key determinant of long run economic development. Prior to oil discovery, agriculture was the mainstay of the Nigeria economy and contributed immensely to development through the production of goods, employment creation, foreign exchange earnings and exports. In the 1960s, Nigeria was one of the largest exporters of agricultural produce in West Africa accounting for 42% of groundnuts exports of the region, 27% of palm oil, 28% of soya beans and 18% of cocoa. The sector's contribution to GDP in the 1960s stood at 64% but declined to 48% in 1970s and was put at 42.2%, 40% and 38.4% in 2007, 2010 and 2015 respectively (CBN, 2015). Today, Nigeria is a major net importer of household food and raw materials. A one-time largest exporter of agricultural produce in West Africa now spends over N1.2 trillion importing palm oil, canned beans and other food items (Ajayi, 2009). Due to the failing sector, the Nigeria government became directly involved in boosting the sector through the introduction of series of macroeconomic programme and policies.

The effect of climate change on agriculture cannot be overemphasized. Increase in temperature is accompanied by reduced farm work due to dehydration and tiredness of farmers (Bello, Ganiyu & Wahad, 2012), drought which include all forms of declining volume of rainfall and shrinking of volume of water in rivers and basins leads to a drop in fishes/fisheries, difficulty in agricultural irrigation etc. which ultimately leads to reduction in agricultural output. Flooding on the other hand destroy aquatic lives and farms while increase in gas emission makes the atmosphere and oceans more acidic thereby hampering agricultural production, fish production and increases the risk of disease and food insecurity. Despite technological advances, climate remains a key factor in agricultural productivity. They are interrelated processes and take place on a global scale. The occurrences of disaster in Nigeria such as the sahelian drought of 1963-1973, the flooding of 2012 amongst others remind us of the effect of climate change on agricultural productivity. Evidence has shown that climate change has already affecting crop yields in many countries (IPCC, 2007). This is particularly true in low-income countries, where climate is the primary determinant of agricultural productivity with Nigeria one of such countries.

Since the dawn of the oil sector in Nigeria, it has become the major source of revenue while the agricultural sector overtime is also seen as a source of revenue for the country and livelihood of majority of the poor in the country. About 80% of the government income, 90-95% of the export earnings and more than 90% of the foreign exchange revenues evolve from the oil sector. Chief among the causes of climatic challenges in Nigeria is gas flaring associated with activities of the oil sector. This is caused primarily by the increase in greenhouse gases such as Carbon dioxide. According to World Bank (2007) Nigeria accounts for roughly one-sixth of the world-wide gas flaring which in turn, spews some 400 million tons of carbon dioxide into the atmosphere. Also, agriculture has remained the main source of livelihood of the people in Nigeria. However, there is a growing worry on the productivity level of agriculture in the face of climatic factor. It has continued to be a major contributor to the nation's GDP, through export, job opportunities among others; hence a distortion of the output level of agriculture in Nigeria will greatly impact negatively on the economy. Employing secondary data, the study aims at analyzing the trend of the country's agricultural productivity

level while examining the relationship between agricultural sector output and climatic change parameters through the use of the ordinary least squares (OLS) estimation technique. The paper is organized in the following format: section one provides a detailed introduction of the study. Review of relevant empirical literature relating to the subject is done in the section two. Section three presents the method of study, section four deals with analysis of data and presentation of findings while recommendations and conclusion are contained in section five.

2. Empirical Literature

Several related studies have been carried out on climate change and agricultural productivity. For instance, Ogundele and Jegede (2011) revealed in their study that food crops are majorly affected by climate change due to soil loss, plant nutrient loss, pest and diseases etc. they thus recommended the planting of cover crops to minimize heat and preserve underground water.

Using descriptive and cointegration analysis, Ayinde, Muchie & Olatunji (2011) revealed that climate change effect on agricultural productivity is critical given its impact on the livelihood patterns of Nigerians.

Employing panel regression analysis for thirteen states in India Kumar & Sharma (2013) examined the effects of climatic and non-climatic factors on food grain productivity in India. The study reveals that the productivity of rice and maize crops are negatively influenced by increase in actual average maximum temperature.

Oloruntuyi & Adigun (2017) in their study on the effects of climate change on agricultural productivity in Nigeria revealed that temperature and rainfall significantly affecting agricultural productivity. The recommended the enactment of a strong law to prevent bush burning, encourage afforestation practice among citizens, so that soil will not be exposed to direct sun light and control erosion and soil water management.

Henri-Ukoha, *et al* (2014) examined the effects of climate change in rice farmers in South East, Nigeria, they concluded that climate change had adversely affected the production of these crops.

3. Method of Study

The research adopted a factorial experimental design and this shows that the research is an empirical analysis on climate change and agricultural productivity in Nigeria using annual time series data from secondary sources for the period of 1986-2016 in estimating the relationship between the dependent variable (agricultural sector output) and the independent variables (average temperature, average rainfall and average sunshine level). The data used for this research were basically obtained from secondary sources and were collected from publications of the Central Bank of Nigeria (CBN) and the Nigerian Meteorological Agency (NIMET). The data required were collected through library research.

The technique of analysis is the ordinary least square due to its BLUE features and the method of analysis is the Error Correction Mechanism (ECM) which correct for all short run errors so as to achieve a better long run relationship while stipulating the duration of adjustment. Pre-estimation tests were carried out to smooth the dataset and have glimpse to the long run relationship among the variables through augmented Dickey Fuller unit root test and Johansen cointegration test respectively. Again, a post-estimation test was carried out to be sure of the robustness of the time series properties of the data set. This was done through residual error test and stability test.

3.1 Model Specification

The model specification in this study streams from the theoretical underpinnings and thus presented as follows;

$$Y_t = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon_t \quad (1)$$

Equation (1) explains that $X_1, X_2 \; and \; X_3$ are the presumed exogenous variables that explain any variation in Y_t.$\alpha$is the intercept, $\beta_1, \beta_2 and \; \beta_3$ are output elasticities with respect to individual input or macroeconomic factor, which are the parameter to be estimated, while, ε_t is the error term of the model.

Equation 1 could be transformed as follows;

$$LNASO_t = \alpha_0 + \beta_1 AVT + \beta_2 ARF + \beta_3 AS + \varepsilon_t \quad (2)$$

Equation (2) is the long run model of linear relationship between the dependent variable Agricultural Sector Output (ASO) and other independent variables Annual Average Temperature (AVT), Annual Average Rainfall (ARF) and Annual Average Sunshine Level (ASL). These variables exhibited the presence of non stationarity properties in their level, this therefore call for a short run model. The choice of Error Correction Model (ECM) is beckoned on the fact that all included variables became linearly integrated at first difference, and they were equally cointegrated, implying that both the long run and short run model are relevant as all short run drift will eventually converge to long run equilibrium.

4. Analysis of Result

4.1 Unit Root Test

Table 1: Augumented Dickey Fuller Unit Root Test

Table 3: Summary of Unit Root Test Results Using Augmented Dickey Fuller (ADF)					
Variables	5% Critical Value	ADF Test Statistic at Level (I(0))	ADF Test Statistic at 1st Differencing (I(1))	Prob at 1st Differencing	Remark
LNASO	-2.967767	-0.279133	-4.249446	0.0025	I(1)
AVT	-2.981038	-1.168263	-4.582452	0.0012	I(1)
ARF	-2.967767	-1.743298	-12.51772	0.0000	I(1)
ASL	-2.967767	-2.477471	-8.876680	0.0000	I(1)

Source: Author's computation (2019)

Table 1 shows the stationarity tests of the variables employed. Variables became stationary at the point where the value of ADF test statistic is greater than the critical value at 5%. At level, variables employed were not stationary. They became stationary after first difference implying that all variables in the model are integrated of order 1, denoted by I(1). The study further carried out a co-integration test, using the Johansen cointegration technique.

4.1.1 Cointegration Test

Table 2: Johansen Cointegration Test

Sample (adjusted): 1988 - 2016
Included observations: 29 after adjustments
Trend assumption: Linear deterministic trend
Series: LNASO AVT ARF ASL
Lags interval (in first differences): 1 to 1
Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None*	0.433711	58.17734	47.85613	0.0343
At most 1*	0.412919	31.68647	29.79707	0.0313
At most 2	0.187317	6.241291	15.49471	0.6670
At most 3	0.007773	0.226297	3.841466	0.6343

Trace test indicates no cointegration at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None*	0.433711	36.49087	27.58434	0.0238
At most 1*	0.412919	25.44518	21.13162	0.0489
At most 2	0.187317	6.014994	14.26460	0.6113
At most 3	0.007773	0.226297	3.841466	0.6343

Max-eigenvalue test indicates no cointegration at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

As shown in Table 2 the existence of long-run relationship among the variables in the model as the trace statistic indicated 2 cointegrated equations at 5% critical value. Thus, the null hypothesis of no cointegration is rejected. Similarly, the maximum eigenvalue indicated two (2) cointegrating equation at 5% level with Max-eigen statistic.

4.2 Error Correction Model

Table 3:Error Correction Test

Dependent Variable: D(LNASO)
Method: Least Squares
Sample (adjusted): 1988 2016
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.223624	0.021265	3.211243	0.0176
D(AVT)	-0.040987	0.024314	-1.911121	0.0426
D(AVT(-1))	-0.074382	0.029225	-3.035139	0.0421
D(AVT(-2))	-0.046386	0.031399	-1.425421	0.1765
D(ARF)	0.054390	0.030124	-2.097765	0.0545
D(ARF(-1))	0.048634	0.028684	-1.832048	0.0599
D(ARF(-2))	0.065683	0.027623	-2.777814	0.0522

D(ASL)	0.000358	0.000274	-3.306036	0.0394
D(ASL(-1))	0.000422	0.000277	-3.523630	0.0308
D(ASL(-2))	0.036473	0.020646	-1.766592	0.1277
ECM(-1)	-0.278016	0.030586	-2.993214	0.0446

R-squared	0.678765	Mean dependent var	0.020821
Adjusted R-squared	0.561123	S.D. dependent var	0.011953
S.E. of regression	0.007743	Akaike info criterion	-8.384667
Sum squared resid	0.000621	Schwarz criterion	-7.547389
Log likelihood	60.13441	Hannan-Quinn criter.	-6.066480
F-statistic	7.894534	Durbin-Watson stat	1.965433
Prob(F-statistic)	0.035214		

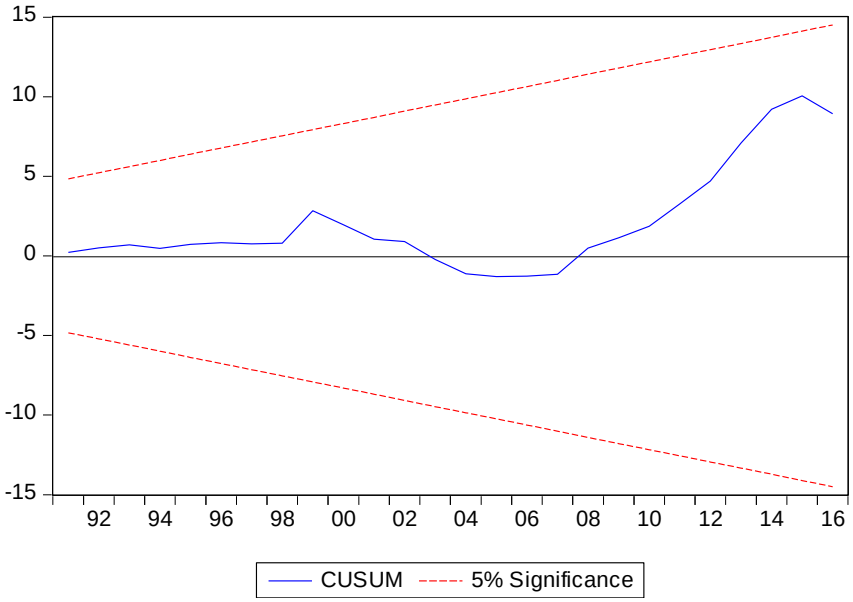
Table 3 show that the adjusted R^2 computed is 0.561123. This means that about 56 percent of the total variation in ASO is explained by the independent variables (AVT, ARF and ASL), while the remaining 44 percent is caused by other factors outside the model but covered by the error term. The Durbin – Watson value calculated is 1.965433 which tends towards 2 and as such there exist an absence of serial autocorrelation in the model. Furthermore, the overall model is significant at 5 percent level since the probability value of the computed F- statistic is less than 0.05%. Again, the estimated coefficient of ECM is rightly signed and significant at 5 percent level (in absolute terms). This means that the ECM can correct any deviation from the long-run equilibrium relationship at about 28 percent. That is, the speed of adjustment (convergence) is 28 percent. Thus, this result forms the basis of our further discussions.

The result from the parsimonious model revealed that Average Temperature (AVT) appeared with a negative sign and was significant at 5 percent level of significance indicating that an increase in temperature will lead to a decline in agricultural productivity. Average rainfall (ARF) on the other hand appeared with a positive sign but was not significant at 5 percent critical level while Average Sunshine Level (ASL) was signed positively and was statistically significant. The implication could be interpreted to mean that the rainfall in the country over the year has not been enough for improvement in agricultural productivity.

Again, AVT and ASL statistically impact on ASO at 5 percent level. Thus, the paper rejects the null hypothesis. The policy implication is that both in the long-run and short-run, Climate change has a negative relationship with agricultural productivity in Nigeria. By extension in Nigeria, one percent increase in AVT and ASL will drop/raise productivity of the agricultural sector by 0.07% and 0.0004% respectively. This is in line with the findings of Ogbuabor & Egwuchukwu (2017) who reechoed that changes in climate change through annual rainfall, carbon emission and forest depletion affect output growth in Nigeria.

4.3 Test of Stability

Figure II



CUSUM Stability Test Result

The stability test enables us to predict the dependent variables in a regression with a reasonable level of precision given the independent variables used in the analysis. The stability test conducted showed that the CUSUM stability test corroborate the stability view with the plot falling within the 5 percent critical acceptance lines, one can generally conclude that the estimated parameters for the study are stable and are useful for policy decision.

Ramsey Linearity Test

To test for linear relationship between the dependent and independent variables in a model, the Ramsey Reset Test is conducted. The null hypothesis is rejected at if the t and f statistic is significant at 5% level of significance.

Table 4: Ramsey Linearity Test

Ramsey RESET Test
Equation: UNTITLED
Specification: D(LNASO) C D(LNASO(-1)) D(AVT(-1)) D(ARF(-1)) D(ASL(-1)) ECM(-1)

	Value	df	Probability
t-statistic	0.512398	23	0.5321
F-statistic	0.354879	(1, 23)	0.5112
Likelihood ratio	0.434217	1	0.5099

Table 5 shows the result of Ramsey Reset Test. The result indicates an acceptance of the null hypothesis. This is so because the t-statistics, the F-statistics and the likelihood ratio are not statistically significant at 5% level of significance.

Autocorrelation Test

The Breusch-Godfrey Serial Correlation LM Test was employed to ascertain if there exist autocorrelation in the model, the. The null hypothesis is that there is no serial autocorrelation

Table 5: Breusch-Godfrey Serial Correlation LM Test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	3.235661	Prob. F(2,22)	0.0560
Obs*R-squared	6.423141	Prob. Chi-Square(2)	0.0661

The result in Table 6 shows the absence of autocorrelation due to the fact that the F-statistics is not significant at 5% level of significance. We therefore, accept the null hypothesis of no serial correlation in the model.

Heteroskedasticity Test

Here, we test for existence of interdependence of error terms across time in the model using the Breusch-Pagan-Godfrey serial heteroskedasticity. The null hypothesis is that there is no heteroskedasticity

Table 6: Heteroskedasticity Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.656642	Prob. F(6,24)	0.5986
Obs*R-squared	4.338701	Prob. Chi-Square(6)	0.6007
Scaled explained SS	3.549870	Prob. Chi-Square(6)	0.7154

The result in Table 7 revealed that the F-statistics is not significant at 5% level of significance, thus the absence of heteroskedasticity. Therefore, we shall accept the null hypothesis of no serial correlation in the model.

5. Conclusion and Recommendation

The paper investigates climate change and agricultural productivity in Nigeria for the 1986 and 2016. Time series data sourced from secondary sources were analysed based on the methodology of cointegration and error correction modelling (ECM) approaches. The data were on agricultural sector output, average temperature, average rainfall and average sunshine. The unit root test showed that variables employed were stationary at first differencing, the co-integration test showed a long run relationship between The result of the analysis reveal that the adjusted R^2 computed is 0.561123 implying that about 56 percent of the total variation in ASO is explained by the independent variables (AVT, ARF and ASL), while the remaining 44 percent is accounted for by other factors not included in the model captured by the error term. The Durbin – Watson value of 1.965433 tends towards 2 and thus implies that there is an absence of serial autocorrelation in the model. The F statistic was significant at 5 percent level of significance and shows that the entire model is fit. Again, the estimated coefficient of ECM is rightly signed and significant at

5 percent level (in absolute terms). This implies that the ECM can correct any deviation from the long-run equilibrium relationship to the tune of 28 percent annually.

From our findings, the coefficients of AVT and ASL conform to a priori expectations except ARF. Also, AVT and ASL were statistically significant at 5 percent level. ARF was not significant. This could stem from the trend in rainfall amount which is low in the northern part of the country, with declines in rainfall noticed from 2007 to 2019 (Adakayi, 2012). This will inadvertently have effect on the productivity level of agriculture. The paper therefore rejects the null hypothesis of no significant relationship between the dependent and independent variables. Based on findings, it is recommended that there is a need to intensify effort on climate change enlightenment campaign. Again, due to the importance of rain to agriculture, innovative agricultural strategies such as irrigation are required to augment the shortage of rainfall. Finally, a national economic plan which will take into cognizance futuristic expected climate change impacts and how to deal with it should be implemented.

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FADAMA III PERFORMANCE IN RIVERS STATE, NIGERIA: A CRITICAL APPRAISAL

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Abstract:

This study assesses the impact of government agricultural projects on rural development in Rivers State with specific emphasis on National Fadama III Development Project in Rivers State, Nigeria. A sample population of 243 was selected for the study. Data were obtained through a well-structured questionnaire, in-depth interviews and field observation and focus group discussions. Descriptive statistics of frequency count, percentages, and mean were used to answer the questions. Hypotheses were tested using Z-Statistics at 0.05 per cent level of significance. Fadama beneficiaries showed "High Extent" in the provision of shelter (build house), afford clothing and feed their households and remain self-reliant (self-employed). However, children's education indicated "Low Extent" due to persistent increase in school fees at all levels of education in the country. There is a significant difference in the mean rural income generation and farm output in favour of fadama registered farmers beneficiaries. It showed that registeredfarmers had more farm productivity. The study concludes that National Fadama III Development Programme performed better in Rivers State due to evidence of good management approach by the programme coordinators. The paper recommended that government agencies should increase awareness about on-going agricultural programmes to encourage participation.Empowerment should be extended to non-farm agriculture such as craft and other skilled trainings to encourage the diversification of rural income base of the youths.

Keywords: National, Fadama III, Agriculture, Development, Project

1. Introduction

Traditionally, agriculture plays a supportive role in rural development. Itprovides rural employment, income and sufficient low priced food. Well over two-third of the world's poorest people dwell in rural areas and are involved in subsistence agriculture. To a large extent, apart from playing an indispensable part in the overall strategy of sustaining rural households, agriculture has come to be regarded by many economists as essential condition that fosters development and economic growth through the provision of labour to industries and firms, households foods, industrial output markets savings and foreign exchange through supply of agricultural raw-materials(Johnson & Mellor, 1961). Rural dwellers who are the supposed first stakeholder

beneficiaries of government agricultural projects have continuously experienced poverty and its excruciating pains and starvation in the presence of government numerous agricultural programmes. In view of this, both federal and state governments have adopted the concept of poverty alleviation strategies to ameliorate the sufferings of the rural poor such as fadama I, II and III among other programmes. It has been suggested that poverty could be reduced through the utilization of untapped resources of fadama farmers to ameliorate the poverty situation of the rural dwellers (Ezeh & Nwachukwu, 2010). For the rural poor, enabling them increase their income level and sustain production of economic goods translates into higher standard of living. This can only be noticed through improvements in self-employment, rural income generation, increase in farm outputs and availability of infrastructural facilities to enhance agricultural productivity.

The desire to harness the enormous potentials of fadama project in Nigeria culminated in the design of National Fadama I which was implemented during the 1993 – 1999, including Fadama II and III Development Projects. While fadama I focused mainly on crop production, downstream activities such as processing, preservation and marketing were largely neglected. The design did not take into cognizance of the need for spatial integration of the markets (creating of physical and market infrastructure). It also failed to take into consideration other fadama resource users such as livestock producers, fishing folks, pastoralists, hunters and others. The project did not also support post-harvest technology, which reduced crop prices and losses due to lack of storage facilities(Mane (2009) cited in Iwala, (2014).

Fadama III project which was a follow-up to National Fadama II project has been assessed by several scholars to have impacted on the economy of the beneficiaries by improving their incomes, increased productivity, attracted infrastructural facilities and generated self-employments (Oladoja, & Adeokun, 2009: Ajayi & Nwalieji, 2010: Ukoha *et al*, 2011: Ohikere & Ajogwu, 2012). Fadama III adopted the Community Driven Development (CDD) Approach by placing the beneficiaries on the driver's seat. This made the beneficiaries to form Fadama Community Associations (FCAs) and Fadama Users Group (FUGs) which empowers them to oversee the

implementation of the project through skills and capacity building by increasing rural income generating activities.

However, despite the acclaimed performance of fadama programme in Rivers State, increasing presence of low productivity, food security, increased food prices, starvation, poverty and social problems of unemployment remained unabated. These unresolved challenges mandated the need toassess the performance of fadama III programme in Rivers State. This is what induced this study.

The specific objectives include; (i) to assess the extent of contributions of fadama III programme to rural self-employment generation in Rivers State, (ii) to identify the contributions of fadama III programme to rural farm output (production) in Rivers State and (iii) to ascertain the impact of fadama III programme on rural income generation in Rivers State.

The study addressed the following questions; (1) to what extent has fadama III programme contributed to rural self-employment in Rivers State? (2) to what extent has fadama III programme contributed to rural farm output in Rivers State? And (3) to what extent has fadama III programme contributed to rural income generation in Rivers State?
This study is guided by the following two null hypotheses;

1. H_{O1}: There is no significant difference in farm outputs between Registered farmers (RF) and Non-registered farmers (NRF) of fadama III programme in Rivers State.
2. H_{O2}: There is no significant difference in farm income generation between Registered Farmers (RF) and Non-registered Farmers (NRF) of fadama III programme inRivers State.
3. Ho_3: There is no significant difference in self-employment between Registered and Non-registered farmers of fadama III in Rivers State.

2. Literature Review

2.1 Theoretical Framework

Several theories of rural development have been propounded to relate agriculture to rural development such as; The High Input Pay-Off Model, The Diffusion Model and the Dual Sector Model of development. However, this

study is predicated on The High Input Pay-Off Theory.This model assigns a strategic role to a new high yielding input varieties and educated labour. It was formulated by Schutz, (1964) to explain why traditional agriculture is characterized by low income and low productivity despite its highly competitive structure. According to Schutz, "in this model, rationally, rural farmers are positive in response to price incentives." In addition, they are efficient resource allocators under the constraints imposed by static technology and the existing factor endowments. In spite of all these, farmers in traditional agriculture remain poor because they have exhausted all the profitable opportunities to invest in the factors at their disposal.Schutz was of the opinion that such investments are associated with very high rate of return compared to investment in alternative projects. Schutz also pointed out that research, technology and education are crucial in this model and regards differences in agricultural income and productivity among countries as essentially a reflection of differences in the scope and quality of investments in research, technology and education among countries concerned.The high input pay off model has considerable relevance for agricultural development in the less developed countries in the following ways: the model gives part of the explanation for the observed failures of farm management and extension programmes to increased productivity in agriculture. Second, the model also provides strong support for current efforts to boost export and food crop production through subsidization of the purchase of pesticides, fungicides, fertilizer and high yielding seed varieties. Third, it provides a justification for government efforts in the training and development of agricultural scientist. Fourth, the model identify for the attention of policy makers the critical variables such as research, education of farming population, agricultural price policy, the rate of return, technical innovations, the growth of the urban industrial sector and explanation of export opportunities in agricultural development.

2.2 The Concept and Approaches of National Fadama III Development Programme

Fadama is a Hausa word for wet land, internationally accepted in soil science literature as wetland soils or hydromorphic soils which are the seasonally or permanently poor drained soils of River valleys and flood plains of the coastal

and Delta swamps. These productive soils can be utilized in both wet and dry seasons. In Nigeria, the irrigable land, flood plains and low lying areas which are underlined by shallow aquifers are found along Nigeria coastal and Delta river swamps and systems. The World Bank through its Fadama Projects has consistently supported the development of agriculture in a bid to help Nigeria achieve food self-sufficiency in the nearest future. It is a tripartite funded program adopted by Nigeria with International Donor Agency (World Bank), Federal and State Governments as sponsors.

Out of the obvious curiosities to resolve challenges in the rural areas, Fadama I programme was designed in 1992 and became disbursement effective in 1993. The design of Fadama I did not support rural infrastructure development and did not consider other resource users such as livestock producers, fisher-folk, pastoralists, and hunters, among others. The focus on crop producers contributed to increased conflicts among the users of fadama resource. But the project did not support post-harvest technology, contributing to reduced crop prices and increased storage losses. And most importantly, it adopted top-down development approach or strategy (Madu & Phoa, (2012).

Rivers state participated in Fadama I but did not participate in Fadama II. However, success story of Fadama II in the participated states called for the introduction of Fadama III of which Rivers State participated from its inception in 2009. Fadama II did not take place in South-South States except Imo state. The reason was due to non-commitment in writing by state governments in the South-South on funding formula. A total of eighteen states participated throughout the country. The cumulative positive impact of both Fadama I and II projects which targeted small-holder farmers by using the Community Driven Development (CDD) approach attest to its robustness (Fadama Coordinating Office Report, 2013). The later ensured optimal participation of the primary beneficiaries as resource and decision making power which devolved to them through the preparation of all-inclusive Local Development Plans (LDP). Under this approach, the programme funded activities in the LDP's, thereby ensuring that the interest of every project beneficiary was protected.

Apart from the project objective of poverty reduction, increasing rural land and water resources, increased food security was an attribute to the achievement of a key Millennium Development Goals (MDGs), Fadama III was saddled with the strategic objective of enhancing growth in sectors other than oil, in order to achieve increased food security, reduce poverty, and create employment in the rural areas, increase opportunities for rural economic development and; contribute to the realization of the agenda for a secured future thereby acting as a catalyst to rapid and sustained development at the grassroots level Akinleye, Awoniyi & Fapojuwo, (2005)

Fadama III was projected to last for the period of five years; 23rd March, 2009 – 31st Dec, 2013. It was a nationwide programme designed to cover twenty Local Government Areas in each of the thirty six states of the federation that targeted small holders farmers involved in pastorals, fisher folks, traders, processors, hunters and gatherers, the disadvantaged and physically challenged. Besides capacity building, the Third National Fadama Development Project was multi-disciplinary in nature, which involved capacity building, communication and information support: Asset acquisition and market system Development; Small Scale Community owned infrastructure (roads, markets, boreholes, culverts, pumps, sprayers etc.), processing and storage centre, advisory services and training. Pertinent about the project was that its services were offered on grant basis with the Community Driven Development (CDD) principle where the rural farmers determined their needs, and it was all about inclusive (production, processing, marketing, storage, etc) in areas of agriculture. The project used trained facilitators to ensure that various Economic Interest Groups (EIG's)/ Fadama Users Groups (FUGs) and Fadama Community Associations (FCA's) were guided.

World Bank recommended the use of Service Providers for proper implementation of Fadama III Sub-projects. These are group of agricultural experts in different areas; crops, fisheries, livestock, processing, agro-forestry and others. They were regarded as contractors usually out-sourced to act as intermediary (middlemen) between the Project Staff and farmers' groups (fadama registered farmers). Farmers were given free hand to choose their Service Providers through competitive bidding process. These Service

Providers were remunerated based on agreed minimal monthly fee. They were held accountable for any failure of the projects. The process helped to ensure that farmers do not divert funds provided for the implementation execution of sub-projects.

Project-staff ensures that cheques are released to Service Providers. It was the duty of the Service Providers to team up with Farmers' groups to execute the sub-projects according to their areas of economic interests. The Project Staff effectively monitored the sub-projects and certified their status before funds were released at each stage. Cheques were released to farmers' groups in tranches of first 40 per cent, second, 30 per cent and third, 30 per cent. Service Provider and his group (team) are held accountable for non-judicious utilization of funds and were made to complete the sub-project to satisfactory level before further funds were released to them. The Project Staff supervised the overall activities of the Service Providers and the farmers.

Projected Plan and Implementation of Fadama III

In the projected financial plan, 100 per cent expenditure for Fadama III programme shared among the stakeholders showed that World Bank was to provide 250m dollars (55.6 per cent), Federal Government 23m dollars (5.1 per cent), State Governments 77m dollars (17.1 per cent), Local Government Areas 40m dollars (8.9 per cent) and Communities 60m dollars (13.3 per cent).

State government and local governments provided 35 per cent funding for capacity building while World Bank made available 30 per cent and Local Government Areas contributed 35 per cent. For advisory services, 70 per cent came from World Bank while 30 per cent was provided by the state government. The Pilot Assets were funded 70 per cent by the World Bank 30 per cent came from the beneficiaries as shown on in table 1. Input Support had 50 per cent funding from World Bank while 50 per cent came from Project Beneficiary Contribution. Funding for Rural Infrastructure had 90 per cent funds provided by International Donor Agency (IDA)/World Bank while 10 per cent came from Beneficiary Contribution which largely came by way of logistics to facilitate activities of Fadama III in the area. This arrangement

was purely on matching Grant Basis of Project/Beneficiary Contribution of Fadama Users/Fadama Community Associations.

Within the period, a total of ₦1, 002,757,398 was projected for Fadama III project in Rivers State, the sum of ₦807,751,735 was donated by the World bank while ₦206, 802,028 came from group's beneficiary contribution. An aggregated amount of ₦718, 759,260 was disbursed while ₦88, 992,475 was outstanding (Nwanyanwu, 2013).

Eligibility Criteria and Participation

Based on the World Bank guideline, the following criteria were spelt out for any state to participate, if government of that state had written a letter indicating interest and commitment through the payment of counterpart fund, recruit through a competitive and transparent process the key officials of State Fadama Development Office (SFDO); State Project Co-coordinator (SPC), monitoring and Evaluation Officer, Procurement Officer, demonstrated evidence of good counterpart funding on similar past or ongoing Project in the state.

For the Local Government Areas, the Local Government Area had provided office space in their council area and assigned two of her staff on secondment as desk officers to the project and provided two million naira (N2m) annually for the operational expenses of the local office.

Registered farmers in the programme had to organize themselves into Fadama User Groups (FUGs) and Fadama Co-operative Associations (FCAs), and registered it along their line of farming interest such as; yam, cassava farming, poultry, fishery, processors marketers, opened a bank account in any commercial bank, and elected officers (Presidents, Secretaries, and Treasurers etc.) to run their affairs, prepared and submitted a Local Development Plan (LDP)/project proposal) to the Local Fadama Desk Officers in their respective local Government headquarters and paid 30-20 per cent of the project cost or 10 per cent in the case of rural infrastructure.

2.3 Empirical Review

Insight into the driving factors behind rural development is not only necessary but relevant from the public point of view. Government policies are undergoing fundamental changes. Instead of distributive measures aimed at attenuating socio-economic disparities, emphasis is given to the development of rural areas through agricultural deliverables; farm output, income generation, self-reliance and others(Errington, 1997).In economic policy terms, this reform is a shift from other policies to actively adapt and maintain structures to transform rural communities.

From the forgoing, studies from other countries have proved that agriculture contributes in no small measure to the development of rural economy. In Malaysia, China and Bangladesh, recent studies showed that agricultural projects, specifically oil palm, cassava and rubber assisted in their emergency to higher GDP growth. According to Ramasany and Darryl, (2005), the oil palm industry has been earmarked by the Malaysia government as a critical player in her aspiration of becoming an industrialized nation. Ramasany and Darryl, (2005) observed that under the Third National Agricultural policy (1992-2010), various policies were formulated to ensure that Malaysia's position in the world Palm oil market is not only sustained, but also enhanced and its competitive edge maintained beyond 5-6 per cent GDP of the nation's economy, 41.3 per cent of world palm oil production and 57.4 per cent world's export of palm oil. In his view, to pursue such goal, agricultural projects must be identified as a focused area for consideration and restructuring to enhance investors' interest and guarantee product availability. The study further revealed that Malaysia oil palm contributed 50 per cent of world palm production in 2002 and about 58 per cent of world export. They further observed that Malaysian economy through oil palm has continued to enjoy growth over the last few decades.

In China, according to Shenggan, Bella & Tolulope, (2010), China's GDP from agriculture increased by 10 per cent between 1980 – 2008 while agriculture in Africa grew only by 3 per cent during the same period which explained divergent adoption of agricultural initiatives. Further distinctions drawn between China and Africa's agriculture showed that growth in China's is estimated to have contributed to poverty reduction more than in Africa. The

impressive impact of agriculture on overall growth and poverty reduction also resulted from good management of her projects, research and capacity institution. They opined that Chinese economy was stimulated by her adoption of improved rubber seedling to boost growth and food security.

In Nigeria, several studies have been done on the possible factors that determine rural development and economic growth. In Nigeria, a survey study conducted by Etim, (2007) in his study of "Poverty Status of Households in Akwa Ibom State, Nigeria," revealed that though a larger size of household is associated with greater poverty incidence since most dependents particularly children contribute less to family income. Unit increase in the number of stocking would decrease the poverty level in the family. This is because the output level is directly related to stocking density and increase in farm output results in a rise in farm income which subsequently improves welfare.

The work of Oladoja & Adeokun, (2009) on "An Appraisal of the National Fadama Development Project in Ogun State, Nigeria" using Chi-Square, Pearson product moment correlation co-efficient and regression analysis showed that the farmer's personal characteristics had no influence on the benefits derived from the project. Study conducted by Olutayo, (2009) on "Infrastructure and Development: Catalysm or Catalysms in Africa? The Case of Fadama Farming in Nigeria carried out between 3rd of May, 2007 and 25th June, 2007 at the Ajibode Resettlement Area of the University of Ibadan, Nigeria, adopting a descriptive approach, showed an elite based top-bottom development strategy elusive of the poor rather than firing from bottom approach which did not favor the rural poor.

A survey study conducted by Etim, (2007) in his study of "Poverty Status of Households in Akwa Ibom State, Nigeria," revealed that though a larger size of household is associated with greater poverty incidence since most dependents particularly children contribute less to family income. Unit increase in the number of stocking would decrease the poverty level in the family. This is because the output level is directly related to stocking density and increase in farm output results in a rise in farm income which subsequently improves welfare. According to Tamuno, (2009; 25), whatever

that is done by any society in the name of rural development, is influenced by the ideas of some scholars.

3. Methodology

This study is a cross sectional survey and comparative design conducted in sixteen local government areas of Rivers State, Nigeria that participated in the National Fadama III Development Project. Population for this study comprised the registered/participating and non-registered/non-participating farmers to Fadama III projects in Rivers State. Multi-stage Proportionate Stratified Random Sampling Technique was implored in selecting one-hundred and seventy-three (173) registered farmers while Cluster Sampling Technique was adopted in the selection of seventy (70) non-registered farmers. Primary sources generated data for this study, namely; Desk inspected materials, questionnaire, in-depth interviews, personal field observations and camera pictures while secondary materials were provided information for the review of related literature. Sorted and transcribed data were pretested. Assessment was based on three selected variables; farm output/productivity, rural income generation and self-employment. Descriptive statistics of frequency count, percentages were adopted to present the socio-demographic profiles. Mean rating was used to answer research question 1 of the study while Z-Test statistics was implored in analyzing hypothesis 2 and 3 at a criteria mean cut-off of 2.5 point using the formula;

$$z = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{S_1^2}{n_1 - 1} + \frac{S_2^2}{n_2 - 1}}}$$

Where;

$\bar{X}_1$ = mean of the 1st group (Registered farmers)

$\bar{X}_2$ = mean of the 2nd group (Non-registered farmers)

S_1 = standard deviation of the 1st group (Registered farmers)

S_2 = standard deviation of the 2nd group (Non-registered farmers)

n_1 = sample size of the 1st group (Registered farmers)

n_2 = sample size of the 2nd group (Non-registered farmers)

4. Discussion of Results

Table 1: Socio-economic Characteristics of Respondents on Gender and Educational Level (n=243)

Variables	GENDER					
	Registered Farmers (RF) (n = 173)			**Non-registered Farmers (NRF) (n = 70)**		**Total (243)**
	Male	Female	Total	Male	Female	Total
Frequency	109	64	173	41	29	70
Percentage (%)	63.0	36.9	100	58.5	41.4	100

Source: Computed from Field Data, 2018.
(See appendix for participated and non-participated Local Government Areas).

EDUCATIONAL QUALIFICATION

Table 2: Educational Qualification

Variables	**Registered Farmers (RF) (n = 173)**					**Non-registered Farmers (NRF) (n = 70)**				
	Primary	Secondary	Tertiary	Non	Total	Primary	Secondary	Tertiary	Non	Total
Frequency	58	98	13	4	173	8	29	10	23	70
Percentages (%)	33.5	56.6	7.5	4.5	100	11.4	41.4	14.2	32.8	100

Source: Computed from Field Data, 2018.

Table 1 presented socio-economic profiles of the respondents which revealed that male registered farmers (RF) in the entire project fell within 109 representing 63.0 per cent while female were 64 representing (36.9%). Male for non-registered farmers (NRF) were 41respondents which accounted for 58.5% per cent while women fell within 29 representing 41.4%. This agrees with the work of Oladoja & Adeokun, (2009) which found that the farmer's personal characteristics had no influence on the benefits derived from the project. For female, analysis results showed that female gender bear more of the brunt as a result of their attachment to child bearing. The male dominated both registered and non-registered farmers.

In terms of educational qualification presented in table 2, the programme had more of the people with secondary education which showed 56.6%. Primary school certificated holders took the second position with 58 respondents representing 33.5%. For tertiary education certificate, only thirteen (13) people had it while people without certificate were four (4) indicating 4.5%. For non-registered farmers, the highest number was twenty-nine (29). In this regard, 41.4% of the respondents represented those with secondary school certificated respondents. Respondents without certificate showed 23 representing 32.8%. The least in the number are those with primary education which was encouraging when compared to other respondents

Table 3**:** Characteristics of Respondents on Age and Household Size. (n=243)

AGE (in Years)

AGE (in Years)	Registered Farmers (RF) (n = 173)		Non-registered Farmers (NRF) (n = 70)	
	Freq.	(%)	Freq.	(%)
29 years below	4	2.3	2	2.8
30 – 39	94	54.3	18	25.7
40 – 49	60	34.6	33	47.1
50 - 59	12	6.9	10	27.1
60 and above	3	1.7	7	10.0
Total =	**173**	**100**	**70**	**100**

Source: Computed from Field Data, 2018.

Table 4: **HOUSEHOLD SIZE**

	Registered Farmers (RF) (n = 173)		Non-registered Farmers (NRF) (n = 70)	
Size	Freq.	(%)	Freq.	(%)
0 – 4	34	19.6	22	31.4
5 – 9	124	71.6	43	61.4
10 and above	15	8.6	5	7.1
Total =	**173**	**100**	**70**	**100**

Source**:** Computed from field data, 2018

On age, results in table 3 shows that ninety-four (94) of the participants were within the 30-39 years of age representing 54.3%. This is followed by respondents within ages 40-59 (34.6%) and 59-60 which is 12 respondents representing 6.9% respectively for registered farmers. On the contrary, more of people with 40-49 showed people within the age of 41.7% years were more among of the non-registered farmers. In terms of household size as shown in table 4, more of the registered farmers 124 were households with 5-9 family members representing 71.6% for registered farmers while non-registered farmers were 43 showing 61.4%. This is followed by people within 0-4 household size with 34 which indicated 19.6%. This explains that people still believe in larger family size as source of labour. It is also perceived to be as a result of poverty level which does not afford the farmers opportunity to hire labour. This is consistent with the work of Muhammad *et al*, (2011) which found that there is better participation by registered farmers/beneficiaries with large household while female membership was low.

Research question 1: To what extent has National Fadama III Development Project contributed to increase in rural self-employment generation in Rivers State?

Table 5: The mean rating on self-employment generation by Fadama III projects.(n=243)

		Mean responses ($\bar{X}$)			
	Self-employment	**Overall mean Responses**		**Overall Mean**	**Decision**
S/N		**RF**	**NRF**		
1	Children education	2.38	2.35	**2.36**	**LE**
2	Shelter (rent)	2.54	2.49	**2.51**	**HE**
3	Clothing	2.68	2.46	**2.57**	**HE**
4	Food	2.66	2.45	**2.55**	**HE**
5	Self-reliance	2.58	2.47	**2.52**	**HE**
	Grand mean			**2.50**	**HE**

***RF**= Participating Farmer **NRF**=Non-Participating Farmer.*

Source:Computed from field data, 2018

Test result on table 5 revealed that only RF had their living standard improved in terms of shelter, clothing, and foodproductivity (feeding) which showed 2.54, 2.68, 2.66 and 2.58 indicating "High Extent" respectively. Children education was found to be inadequate, indicating 2.38 "Low Extent"which is below the criteria cut-off point of 2.5. It explains the economic situation in which there is high rate of school fees from nursery to university education. It means extra pressure is being mounted on the parents to train their children in higher institutions. However, while the result on children education showed 2.38, it means that trained fadama registered farmers were almost at the margin where the experienced pressure to pay their children's school fees is not at a critical point with the 2.38 result.

Table 6: Z-test on the difference in the mean rural income between the RF and NRF of Fadama III projects.(n=243).

Project	**Farmer**	**N**	$\bar{X}$	**SD**	**df**	**z-cal.**	**z-crit.**	**Decision at p>.05**
Fadama III Project	RF	54	73,576.92	22,733.54	78	- 4.764	1.960	**p=0.00 S, p<.05**
	NRF	26	48,944.44	21,136.94				
Overall			**17,851.73**	**3,852.89**	**241**	**- 5.919**	**1.960**	**p=0.00 S, p<.05**

Decision rule: *if p<.05 reject H_o, else retain H_o.* ***S****= Significant, p<.05*
NS*= Not Significant p>.05*
Source**:** Computed from field data, 2018

Table 6 result on rural income generation shows that there is a significant difference in the mean rural income (Naira) generation between the RF and NRF ($Z_{241,\ 0.025}$ = -4.764, p<.05). The overall meandifference of (₦17, 851.73) was in favour of participating farmers (RF). The result revealed that participating farmers generated more income when compared to their non-participating counterparts. The result is also consistent with the findings of Etim (2007) which discovered that larger size of household is associated with greater poverty incidence since most dependents particularly children contribute less to family income which a unit increase in the number of

stocking would decrease the poverty level in the family. It then validates the objective of fadama to improve the living standard of households.

Table 7: Z-test on the difference in the mean rural farm outputs between the PM and NPF of
Fadama III projects. (n=243).

Project	Farmer	N	$\bar{X}$	SD	df	z-cal.	z-crit.	Decision at p>.05
Fadama III Project	PM	174	5.11	1.09	78	- 4.385	1.960	**p=0.00 S, p<.05**
	NPF	70	4.02	.95				
Overall			**1.09**	**0.14**	**241**	**- 4.410**	**1.960**	**p=0.00 S, p<.05**

Decision rule: *from our probability value,if p<.05 reject H_0, else retain H_o.*
*(**NOTE: S**= Significant, p<.05 **NS**= Not Significant p>.05).*
Source: Computed from field data, 2018.

Test result on table 7 show a significant difference in farm output between RF and NRF of Fadama III project, ($Z_{241,\ 0.025}$ = - 4.385, p<.05). Overall mean difference of (1.09) was in favour of fadama registered farmers (RF). This is consistent with the work of Ukoha *et al*, (2011) which showed that more productivity withregistered farmers that adopted better technology and improved farming approach through fadama training than their counterparts. This result conforms to the results obtained by Oladoja & Adeokun, (2009) which discovered that rural infrastructure is the bedrock for increased agricultural productivity and development.

5. Conclusion and Recommendations

Fadama III project targeted at alleviating the poverty level of rural dwellers through self-employment, rural income generation and increased farm outputs. Participation was determinedby the essence communities embraced the programme with a view to contributing their quota through logistics to attract the benefits. The study revealed that more of the men participated in the project than the women. Participants were mostly people within the middle aged group. Fadama registered farmers showed “High Extent” in the provision

of shelter (build house), afford clothing and feed their households and self-reliant (self-employed). However, children's education indicated "Low Extent" due to persistent increase in school fees at all levels of education in the country. To this end, fadama registered groups could feed from increased farm produce and income, build a moderate accommodation and remain sustained. There is a significant difference in the mean rural income generation between registered and non-registered farmers. Meandifference was found in favour of fadama registered farmers showed that fadama registered farmers performed better. Result further showed a significant difference in farm output in favour of with overall mean difference of 1.09.The study concludes that National Fadama III Development Programme performed better in Rivers State due to evincing management approach of the programme coordinators.The study suggested that; (i) Government agencies should increase awareness about on-going agricultural programmes to encourage participation. Many potential farmers became aware of government agricultural programmes when they have elapsed. (ii) There should be compulsory participation in agriculture by local government councils in terms of counterpart funding. Where seven local governments failed to utilize opportunities provided by fadama programme showed a great reduction in agricultural productivity and rural income generation and (iii) Empowerment should be extended to non-farm agriculture such as craft and other skilled trainings to encourage diversification of rural income base of the youths.

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Appendix

Senatorial Zones	**Non-participated Local Government Areas**	**Participated Local Government Areas**
Rivers South-East	1.Opobo/Nkoro 2.Andoni 3. Tai	1.Eleme 2.Gokana 3.Khana 4. Oyigbo
Rivers West	1.Abua/Odua 2.Asari/Toru 3.Bonny	1. Ahoada West 2.Akuku Toru 3.Ahoada East 4.Degema 5. Onelga
Rivers East	1.Port Harcourt 2.Ogu/Bolo	1.Etche 2.Emohua 3. Ikwerre 4. Okirika 5. Obio/Akpor 6.Omuma
Total =	8 L.G.As	15

Source: Author's Desk Research, 2018

N/B: In Rivers South East, Tai Local government Area participated but discontinued few months into the program. The reason was that they couldnot continue payment of the counterpart funding and provision of liaison office at the local government council andpayment of fadama III desk officer.

RESIDENTIAL STAFF HOUSING PATTERN AND DYNAMICS IN UNIVERSITY OF PORT HARCOURT

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Abstract

Housing encompasses all the ancillary and community facilities which are necessary to human well-being and it is controlled by institutional, legal, political, social, economic, demographic and environmental processes. This paper therefore examines the pattern and dynamics of staff housing in University of Port Harcourt. In this study, primary and secondary data were sourced and used. Survey method was adopted for the study and the data collected were analyzed using simple percentage and results presented in tables. A total of 222 copies of questionnaire were distributed but 156 copies were retrieved for analysis. Using questionnaire as research instrument, and secondary data the researchers found that staff housing in the study area are varied and mixed. The houses found include duplex mansion, twin duplex, duplex, terrace duplex, bungalows and flats. Furthermore 222 housing units and 692 rooms were enumerated. The study also found that the houses are grossly insufficient for staff. However, academic staff particularly those on professorial cadre and senior lecturers have more access to staff housing than all other categories of staff. The non-academic staff are more disadvantaged particularly those on CONTISS 1 to 8. Based on the aforementioned, it is argued that construction of more residential accommodation is embarked upon. Also, the extant staff housing policy should be holistically reviewed to accommodate all categories of staff.

Keywords: Staff, housing, Pattern, supply

1. Introduction

Historically, university staff housing in Nigeria delivery dates back to the 1960s in the University of Ibadan. University staff quarters are residential buildings constructed by the university management to accommodate qualified rent paying staff. As a complex commodity, its behaviour is dictated by institutional, legal, political, social, economic, demographic and environmental processes (UNHABITAT, 2016 and Gunner, 2011). Housing supports the social and physical functioning of families and it is craved for by households across all strata of the society. To be specific, staff

accommodation provided by employers helps to motivate workers to be efficient and productive. It also projects the corporate image of an organization (Wallace, 2015). In the universities, staff housing helps members of the faculty and staff to frequently and informally have contact with students thus enhancing the total educational mission of the university. The need for housing is as vital as the air mankind breaths (United Nations Economic Commission for Europe, 2016). It is against this backdrop that governments cum employers of labour across the globe make effort to provide housing for members of staff.

Nevertheless, the low investment in education by successive governments in Nigeria has grossly affected infrastructural development in the universities. The effect of poor funding has been negative and particularly explicit on staff housing availability and supply in Nigerian universities. It is important to remark that the various housing policies including the most recent 2012 Housing Policy makes no emphatic reference to staff quarters development in Nigerian universities. Housing availability when used loosely as used in this study implies not only the vacancy rate in the housing stock but also other concomitants of the housing supply as rent levels, diversity of choice in size and location, and quality (Bright and Nicholas, 2011).Universities in Nigeria can neither boast of any tangible staff quarters nor have any tangible plan for staff quarters development. Staff residential housing construction in the Nigeria universities has been weak for almost four decades (Ndukwe, Nnaji and Nwuzor, 2015).

Empirical evidence suggests that in spite of the efforts of the various vice chancellors at improving on residential staff housing the nagging issue of staff accommodation remains. In University of Port Harcourt for instance, construction of staff accommodation in the last two decades has been dismal. In all, only five units of houses were added to the existing stock. This does not correspond with the increase in staff recruitment which now stands above 5000 (NUC, 2015). The degree of staff residential housing need on campus keeps exacerbating hencemost members of staff are battling with accommodation outside the university residential quarters. The few available houses are not without structural issues as close physical examination reveals that over two thirds of the buildings are antiquated with badly rusted roofing sheets. There are even reports that some members of staff renovate their

apartment with their money without reimbursement from the authority. It is against this backdrop that this study seeks to analyze the pattern and dynamics of residential staff housing in University of Port Harcourt.

2. Conceptual Clarification

2.1 Over view of Staff Housing in Nigeria

It is generally believed in industrial relations and management's circles that the provision of housing to members of staff is a great incentive to workers' productivity (Davies, 2010). In Nigeria, the provision of accommodation for employees is provided for by the law. For instance, the Employee's Housing Scheme law specifically compels every designated employer of labour with over fifty members of staff (whether corporate or not) to make provision for not less than fifty units of accommodation in respect of each designated employer and the units shall form part of an integrated development with other similar units and shall be located contiguous or as near as may be reasonable in the circumstances to the places of work of the employees concerned (Employees Housing Scheme Act,1979). By this Act, it is obligatory for every big employer of labour to provide and maintain a housing accommodation for their staff. The Employees Housing Schemes (Special Provisions ACT of 1979) also espoused the goal of a decent home and a suitable living environment for all workers and provided the rationale for an ambitious staff housing development. From the point of view of law, the provision of decent and affordable accommodation for the public is guaranteed by local regional and international treaties and laws. Specifically, the 1999 Constitution of the Federal Republic of Nigeria as amended in section 16(1) (d) under the fundamental objectives and directive principles of state policy states clearly that government shall provide suitable and adequate shelter for all citizens (Constitution of the Federal Republic of Nigeria, 1999).

Hitherto to Nigeria's independence, the colonial government through a bias housing policy for the elites sought to provide houses at minimum rents to all colonial staff and a few necessary indigenous support staff such as clerks, prison officials, police and army. Over the years, attempts have being made by governments at various levels at providing accommodation for the working class. The colonial masters introduced the African Staff Housing Scheme

(Ibem, Anosike and Azuh, 2011). This scheme was designed to motivate public servants to see their service as a worthwhile venture. Years later this scheme was transformed into a different and more encompassing one with a view to providing mortgage facilities for government workers. Government at the time thought that the intervention will assist in the provision of housing for the work force. Recognizing, the need to institutionalize the scheme and to make it sustainable, it was later rechristened "The Federal Government Staff Housing Loans Board". Overtime it metamorphosed into a self-accounting agency of government. It should be noted that from the beginning, the Board was supervised by the Ministry of Works and Housing. But later, it was moved to the Service Welfare Office of the Head of Civil Service of the Federation. As a substantive parastatal, it was set up to drive the housing policy of Federal Government staff by assisting them to purchase, build or renovate their own houses, for a peaceful upon retirement from civil service (Ndukwe, Nnaji and Nwuzor, 2010).

Another effort by government towards housing delivery for the working class was the establishment of National Housing Fund (NHF) in 1992. In line with this scheme, any public servant or employee in the organized private sector in Nigeria earning N3, 000 or more per annum is expected to contribute 2.5% of their monthly salary to NHF (Aminu and Ruhizal, 2013). The funds mobilised will be made available to contributors at affordable interest rates to build homes. It was expected that active contributors to the scheme, can access a loan of # 5 million maximum at the interest rate of 6% to be repaid within a period of 30 years. It is sad to note that as laudable as these aforementioned policies were, very little in terms of housing delivery and ownership was achieved by the targeted population. Indeed the real issue of housing deficit still persists.

In response to housing plight of workers particularly federal civil servants, the Head of Service of Nigeria in 2015 conceptualized and launched a comprehensive housing scheme for federal civil servants under the Federal Integrated Staff Housing. Determined to deliver on its core mandate of providing cost effective and affordable housing for various categories of workers in Nigeria the Office of the Head of the Civil Service of the Federation (HOS) entered into partnership with the American Building System

International (ABSI) (Federal Government Staff Housing Loans Board FGSHLB, 2018)

2.2 University of Port Harcourt and Staff Housing Policy

University of Port Harcourt is a public federal university established in 1975 as a campus of University of Lagos. It was given university status in 1977. The University is located along the east west road in Nigeria's oil rich city of Port Harcourt. It has three campuses namely: Abuja Park, Delta Park and Choba Park. Choba and Delta Parks sites are firm in texture and plain in terrain and fairly rectangular in shape and covers 36.50 hectres and 43.30 hectres respectively while Abuja Park is partly firm in texture and water logged and covers about 3,791.30. The university boasts of staff strength of over 5,000 staff and student population of 35,000 (NUC, 2015).

University of Port Harcourt the policy on staff housing limits beneficiaries of staff housing to staff on university system scale 9 and above (University of Port Harcourt, 2015) By this policy, only professors or equivalent, readers or equivalent, senior lecturers or equivalent and lecturers or equivalent are officially qualified or eligible for allocation of university staff quarters. In addition to qualification, differentiation is made on a point's system which is based on the year of service at university, which has 1point; spouse, this has 2points; children, this attracts 1point; and other dependents actually living with the persons which has 1point. The points are used in the assessment for allocation in the staff quarters by the housing committee subject to approval by the Vice-Chancellor. The law stipulates that application for staff quarters must be made to the Housing Officer on the prescribed form obtainable from the Housing Unit and that an allocation must be accepted in writing before occupation of the quarters.

3. Methodology

This study adopted the cross sectional survey. The primary and secondary data sources were used. Household heads in the quarters typified the study population. Participant study was undertaken in addition to the use of the primary data. In this regard, 222 copies of questionnaire were administered to household heads. Secondary data from the Housing Unit of the University of Port Harcourt was heavily used in the study. All the staff that is 100% of the

residents in the staff housing was sampled. The copies of questionnaire correctly filled and returned were 156 which amount to 70.2% of the population of the study. Analysis of results was therefore based on the returned copies of questionnaire. A descriptive statistical method was used to analyze the data. Specifically simple percentage was deployed for analysis.

4. Results and Discussions

The findings of the study are presented in tables and the results are elaborately dissected and interpreted. Table one below shows the types of housing in University of Port Harcourt staff quarters. The survey reveals that there are bungalow, twin duplex, terrace duplex, duplex mansion, flat and duplex houses in the staff quarters. As demonstrated by the table, bungalow is the dominant type. It constitutes 56.3% of the entire house types sampled. Also it is with the highest number of rooms. Succinctly put, bungalow has 390 rooms which represent 54% of the entire rooms in the staff quarters of University of Port Harcourt.

Table 1: Types of Staff Housing in University of Port Harcourt

Housing Types	**Quantity**	**%**	**No of Rooms**	**%**
Bungalow	120	54	390	55.2
Twin duplex	2	0.9	8	2.3
Terrace duplex	73	3.28	165	23.8
Duplex mansion	12	5.4	93	13.4
Flat	8	3.6	8	1.2
Duplex	7	3.1	28	4
Total	222	10	692	100

Source: Researcher's fieldwork, 2018

It should be noted that all other types of housing in the study area approximate to 53.7% implying that most of the staff accommodated in the staff quarters are in bungalow. It can be argued that the high presence of bungalow within the residential precinct of University of Port Harcourt is due availability of land and cost. Bungalows are very common in many cities in Nigeria and are easy to construct.

The table 2 below shows the total number of housing units and rooms in the different types of staff housing in the staff quarters on the three campuses of University of Port Harcourt.

Table 2: Housing Stock

Location	**No. of Duplex Mansion**	**No. of Rooms**	**No. of Twin Duplex**	**No. of Rooms**	**No. of Duplex**	**No. of Rooms**	**No. of Terrace Duplex**	**No. o Rooms**	**No. of Bungalows**	**No. of Rooms**	**No. of Flats**	**No. of housesRooms**	**Total no of housing units**	**% of houses units**	**Total no of rooms**	**% of rooms**
Abuja	17	85	-	-	7	28	61	129	66	210	8	16	159	71.6	535	77.3
Choba	-	-	-	-	-	-	-	-	5	15	-	-	5	2.3	15	2.2
Delta	-	-	2	8	-	-	12	36	44	110	-	-	58	26.1	142	20.5
Total	17	85	2	8	7	28	73	165	115	405	8	8	222	100	692	100

Source: Researcher's Fieldwork, 2018

As vividly shown by table 2, out of the 222 total housing units, 71.6% of the houses which translate to two thirds of the houses are located in the Abuja campus. In terms of number of rooms in the Abuja campus staff quarters, it has 535 rooms which amount to 77.3% of the total 692 rooms in all the staff quarters in the three campuses. This implies that among the three campuses, Abuja campus occupies the highest proportion of staff quarters and the highest number of rooms. The high presence of staff quarters in Abuja can be related to the fact that Abuja is the permanent site of the university and has the highest land mass (University of Port Harcourt Act, 1975). In the light of this, it is expected that more effort will be devoted to its physical development.

However, only 2.3% and 26.1% of the staff residential housing are located in Delta and Choba campuses respectively. The remaining 22.7% of the bed rooms are in Choba and Delta campuses respectively. (See table 2). It should be remarked that Choba campus has the smallest housing stock. This can be attributed to the fact that Choba campus started as a Teacher's Training College before the establishment of the University of Port Harcourt. Upon the

establishment of the University, the premises became a site for the University. It is therefore clear that Choba Park as it is also called was not originally designed as a university campus.

The study also shows categories of staff living in staff quarters. (See table 3).The table shows that no graduate assistant is accommodated in the staff quarters. By the extant housing policy of the University of Port Harcourt graduate assistants are not entitled to accommodation on campus.

Table 3: Category of Academic Staff in Staff Quarters

Category	**Frequency**						**Average**	
							No	**%**
	Delta	**%**	**Abuja**	**%**	**Choba**	**%**		
Professors	14	36.8	84	72.4	1	50	99	63.4
Associate Professors	2	5.26	2	1.72	-	-	4	2.5
Senior Lecturers	8	21.0	27	22.4	1	50	35	22.4
Lecturers I	6	15.7	-	-	-	-	6	3.8
Lecturers II	6	15.7	3	2.58	-	-	9	5.76
Assistant Lecturers	2	5.26	-	-	-	-	2	1.28
Graduate Assistants	-	-	-	-	-	-	-	-
Total	**38**	**100%**	**116**	**107**	**2**	**100%**	**156**	**100%**

Source: Researcher's Fieldwork, 2018

Based on the finding as presented in table 3, there are more professors in the staff quarters than any other category of academic staff. Professors in the quarters represent 63.4% of the entire academic staff resident in the quarters. This agrees with staff housing policy wherein, preference is given to professors before other members of staff. However, a paltry 2.5% of staff of the rank of associate professors are in the staff quarters. This number is quite small compared to the proportion of senior lecturers residents in the staff quarters. Senior lecturers make up 22.4% of the total sampled academic staff in the staff quarters. It is worthy of note that only 1.28% of the academic staff in quarters are assistant lecturers. Clearly they represent the least number of in terms of academic staff accommodated on campus. This development can be situated with the university staff housing framework wherein members of staff

in this cadre are not entitled to accommodation on campus. Perhaps the few members of staff in this category accommodated in the staff quarters were considered for accommodation on special need.

The study again gave insight on the categories of non-academic staff residing in the staff quarters of University of Port Harcourt. Illustrated in the table 4 are the categories of non-academic staff living in staff quarters on campus.

Table 4:Categories of Non Academic Staff in Staff Quarters

Category	**Frequency**						**Average**	
	Delta	**%**	**Abuja**	**%**	**Choba**	**%**	**No**	**%**
CONTISS 1-5	-	-	3	6.8	-	-	3	4.5
CONTISS 6	-	-	-	-	-	-	-	-
CONTISS 7	-	-	-	-	-	-	-	-
CONTISS 8	-	-	2	4.5	-	-	2	3.03
CONTISS 9	-	-	2	4.5	-	-	2	3.03
CONTISS 10	-	-	-	-	-	-	-	-
CONTISS 11	4	21.0	6	13.6	1	33.3	11	16.6
CONTISS 12	2	10.5	3	6.8	1	33.3	5	7.5
CONTISS 13	7	36.8	13	29.5	1	33.3	21	31.8
CONTISS 14	6	31.5	7	159	-	-	14	21.2
CONTISS 15	-	-	8	18.18	-	-	8	12.1
Total	**19**	**100%**	**44**	**100%**	**3**	**100%**	**66**	**100%**

Source: Researcher's Fieldwork, 2018

Among the sampled non- academic staff, those on CONTISS 13 living in staff housing are 31.8%. One factor that can account for this situation is the fact that members of staff on CONTISS 13 are senior members of the non-academic staff and by the staff housing policy they are meant to be accommodated in the staff quarters. However it is important to note that, non-academic staff on CONTISS 13-15 resident in staff quarters make up 65.1% while staff on CONTISS 1-11 in quarters represent 34.9% of the entire non-academic staff in the staff quarters in all the three campuses of the University.

(See table 3). It can be mentioned that in these categories of staff on CONTISS 1 to 11, members of staff on CONTISS 8 and 9 accommodated on campus are only 4 which amounts to 6.6% of the 66 members of non- teaching staff in the quarters. It can be inferred from this study that members of staff in the junior cadre do not have access to accommodation as much as their senior counterparts. This pattern seems to be consistent with the staff housing policy of the university which says that only staff on CONTIS 9 and above will be considered for accommodation in the staff quarters. The University of Port Harcourt staff housing policy stipulates the categories of staff that are eligible or qualified for residential accommodation in the staff quarters of the university. Further implication of this is that the housing policy of the University of Port Harcourt is crafted to favour the senior staff cadre. This therefore raises the issue of access to housing by the low income constituency.

5. Conclusion and Recommendations

Staff housing is special accommodation for members of staff of a particular establishment. Generally, housing supports the social and physical functioning of members of staff. Several other attempts over time have being made to provide the working class with accommodation including the National Housing fund (NHF). Specifically, the 1999 constitution of the Federal Republic of Nigeria as amended in section 16(1) (d) under the fundamental objectives and directive principles of state policy states clearly that government shall provide suitable and adequate shelter for all citizens (Constitution of the Federal Republic of Nigeria as amended1999). In Nigeria, university staff housing delivery dates back to the 1960s in the University of Ibadan. Since then, various governments and university managements' have invested in staff housing developments.Within the context of University of Port Harcourt the policy on staff housing limits beneficiaries of staff housing to staff on university system scale 9 and above. By this policy, only professors or equivalent, readers or equivalent, senior lecturers or equivalent and lecturers or equivalent are officially qualified or eligible for allocation of university staff quarters. The University of Port Harcourt Staff Housing Quarters is grossly inadequate to house the workforce of the university. The study therefore recommended the construction of more housing units to reduce staff residential housing deficit and a comprehensive review of the extant staff housing policy that will expand access to housing in the system.

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GOVERNMENT SPENDING IN SELECTED SECTORS AND JOB CREATION IN NIGERIA: A COMPARATIVE ANALYSIS

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ABSTRACT

This paper examined a comparative analysis of the effect of government spending in selected sectors on job creation from 1981 to 2018. The study was induced by the deficient and instability in federal government budgetary portions to some critical sectors such as agriculture, education; and health sectors that tend to prompt the neglect of agricultural sector, deterioration in the academic standard as well as decay in the health care service. Thus, time series data were collected from CBN bulletin from 1981-2018 on variables such as job creation proxy by employment rate, capital and recurrent government expenditure on agriculture, education, and health, sectors. The co-integration and ECM methods were used for the analysis. The ADF unit root, Johansen cointegraton test demonstrated that all the variables were stationary and have long run relationship. The results of the parsimonious error correction model in Model I the R^2 of 66% revealed that the model has a good fit, R^2 of 66%. The coefficients of capital spending in the agricultural, education and health sectors were positively and significantly impacted on job creation. In Model II, the R^2 of 58% demonstrated that the model is a good fit. The coefficient of government recurrent expenditure in the agricultural sector is negatively and significantly impacted on job creation at 5 percent level. Also, the coefficient of government recurrent expenditure in the education sector is positively signed and statistically significant with job creation at 5 percent level. Also, government recurrent expenditure in the health sector is positively signed but statistically not significant with job creation at 5 percent level. In view of the discoveries, the study suggested that legislature ought to guarantee infrastructural development through increment in yearly capital spending so as to expand the degree of job/employment creation in Nigeria. Government should intensify effort in improving on the budgetary allocations to the se critical sectors in order to create jobs.

1. Introduction

One of the policy targets of every nation is accomplishment of full-employment. Full-employment to a large extent mean a negligible level of unemployment. By unemployment we mean a circumstance whereby the individuals who are willing and ready to work at the predominant pay rate and allowed by the law of the nation can't find work to do. It means that the nation concerned had not produced the ideal degree of employment. Accordingly,

governments at different levels have embraced policy measures to create job and minimize joblessness. One of such measures is fiscal policy via government spending. Thus, government spending entails financial matters in which government income and consumption are utilized as a change of either to accomplish the desirable impact and maintain a strategic distance from the undesirable ones and example of the desirable impact is job creation (Obayori, 2016)

Meanwhile, Job is created when openings for work could be given by government through her funding in the planning of social and financial framework in the economy. This infers the provision of infrastructural amenities through government spending has twofold stimulus of creating job opportunity legitimately and simultaneously utilizing the amenities towards empowering the profitable sectors so as to deliver and give job opportunity to the teaming labour-force (Abdullahi, 2010; Ewubare&Maeba, 2018).

Experimental proof provides that government spending promotes the degree of employment while decreasing joblessness in both advanced and advancing nations (Carmignani, 2014). By the way, the effect of government spending in improving the degree of job while lessening joblessness in a nation isn't without dissonant outcome in economic literature. As far as prevailing perspective among researchers, it is proposed that government can assume a significant job in upgrading the degree of employment through fiscal arrangement in the nation. This infers that government spending as a significant instrument can empower the administration to mediate in accomplishing full-employment in the economy; this therefore, supports the proposition of Keynesian-hypothesis of employment. Thus, the Keynesian complete consumption model gives the establishment to understanding the linkage between government funding and employment. This model places that an increment in government spending incites extension in business output, which thus prompts more prominent job and subsequently a decrease in joblessness, ceteris paribus (Oaikhenan & Aigheyisi, 2015).

Meanwhile, a cooperative report did by the International Food Policy and Research Institute (IFPRI) and the World Bank in 2008, uncovered that national administration of Nigeria government spending in agriculture is under 2% of total government yearly budget. This is fundamentally low contrasted

with other developing nations like Kenya (6%), Brazil (18%) and 10% objective set by African Leaders Forum, under the Comprehensive Africa Agricultural Development Program (Uger, 2013). Accordingly, statistics from the ministry of finance and Nigerian dailies shows that despite the increase in the yearly budgetary allocation in Nigeria, just 4% in 2011, 5% in 2012; 6.04% in 2013 and about 4% in 2017 of the Nigerian yearly spending plan was allotted to the health sector against the 15 percent AU proposal (CBN, 2017). In a similar period (2011, 2012, 2013 and 2017) just 7.2%, 8.4%, 8.7% and 4% of the total spending plan was assigned to the education sector against the 26 percent UNESCO suggestion. The above situation has expanded the pace of ignorance. A large portion of the labor-force are untalented and they utilize out-modeled tools and techniques for production. By suggestion, their negligible efficiency is very low and this prompts low genuine pay, low reserve funds, low speculation and low pace of capital development.

In sum, the above statistics at least suggest the existence of joblessness in Nigeria, today. The NBS (2017) announced that joblessness rate increases from below 10% in the mid-1980s to 23.9% in 2016. The World Bank (2014) has it that salary imbalance compounded from 38.7% during the 1980s to 48.8% in 2010. Summing the two ends, Ekine (2014) opined that these issues are likewise deteriorating as the economy develops vis-à-vis employment generation in Nigeria, It is against this backdrop that this study sets to give answers to these inquiries; what is the impact of government spending in education, health and agricultural sectors in Nigeria? The remaining sections of this paper examines, government spending and job creation in some sectors, methodology, results and discussion as well as conclusion.

2. Literature Review

2.1 Government Spending in the Education Sector and Job Creation

Education has a connection with financial improvement. Thus, Aruwa (2010) revealed that increase in national income and per capita income is an element of education and that distinctions among countries can be clarified by differences in human endowment, as opposed to physical capital. This underscores the motivation behind why the 'Asian Tigers' in the previous three

decades distributed between 25-35% of their yearly spending plans to their training and development of mankind (Aboribo, 1999).

Omotor (2004) evaluated the profile of education expenditure in Nigeria from 1977–1998 by utilizing least squares system. It was found that national government income is the solitary huge determinant of education consumption; subsequently this may create inefficiency without different wellsprings of financing.

Muhammad Mukaramah and Mohd (2017) utilized input-output to study the impact of job creation by government spending on education. This spending play a significant role to build skilled worker, job creation and satisfy labor prerequisite in economic subdivisions. Simultaneously, training additionally considered as human capital speculation to build the profitability of work and decrease financial issues, for example, joblessness and poverty. At the end of the day, education is considered as wellspring of riches in the public arena.

Abu and Abdullahi (2010) utilized a disaggregated examination of government spending having absolute capital consumption on training, transport and correspondence and health spending. They found that capital and recurrent spending's in education have negative impact on development.

Onyeagba and Eze (2013) examined the impacts of public investment in training on development in Nigeria over the period 1997 2012. Information for the investigation was sourced from CBN fact book. The authors concentrated on disaggregated and sectoral investment analysis utilizing OLS technique. The outcome demonstrated that legislature recurrent expenditure is emphatically however not fundamentally identified with GDP but rather government capital investment is directly and essentially identified with GDP.

2.2 Government Spending in the Health Sector and Job Creation

Given the nexuses among health and employment, Oni (2014) examined the effect of investment in health on economic development in Nigeria. With the utilization of least square technique. The outcome demonstrates that gross capital development, aggregate health investment and labor-efficiency are significant determinants of financial development in Nigeria while rate of life-expectancy has negative effect on development. Accordingly, the

accompanying strategy measures are proposed among others that administration ought to empower reserve funds and interests in the economy, increment uses on wellbeing arrangements, and instigate the degree of work efficiency and spot need on the issues of security to lives and properties in Nigeria.

Baltagi and Moscone (2010) gauges a relapse condition for human services use as an element of GDP and other control factors utilizing information on 20 OECD nations over the period 1971-2004 by utilizing most extreme probability estimation (spatial MLE) methods to gauge and test fixed impacts and spatially related mistakes. The creators find that human services use is a need instead of an extravagance with versatility a lot littler than that assessed in past investigations.

Odior (2011) who concentrated the connection among wellbeing and financial development by utilizing a coordinated consecutive unique calculable general harmony (CGE) model over the period 2004-2015 to examines the effect of government consumption on wellbeing on monetary development. The discoveries recommend that the re-allotment of government use to wellbeing area is noteworthy in clarifying financial development in Nigeria. Additionally, Dauda (2011) analyzed the connection between wellbeing use and financial development for Nigeria from 1970-2009 by utilizing blunder redress model. The creator recommends that wellbeing consumption is sure and measurably critical yet the coefficients of the second and third slacks are negative and factually noteworthy. The consequence of mistake revision model is negative and measurably huge with 40% speed of change.

Adeniyi and Abiodun (2011) utilized common least square (OLS) to analyze the effect of wellbeing use on financial development over the period 1985-2009. The creators recommend that if assets are appropriately directed and suitable exhausted to both the repetitive and capital ventures in wellbeing, the presence of a positive connection between monetary development and wellbeing will be more augmented.

In a similar vein, Bakare and Sanmi (2011) utilized O.L.S multiple regression for yearly time arrangement information for Nigeria covering 1974-2008. The outcomes demonstrate a critical and positive connection between health

spending and monetary development. Ogundipe and Lawal (2011) analyzed the effect of health spending on financial development in Nigeria. Utilizing the OLS procedure, they found an indirect effect of aggregate health spending on development.

2.3 Government Spending in the Agricultural Sector and Job Creation

Adofu, Abula and Agama (2012) researched on the impacts of government budgetary distribution to agricultural output and job opportunity in rural area of Nigeria with the use of OLS. The results showed that budgetary distribution to rural areas has huge impact on rural job generation and job opportunity in agrarian segment in Nigeria and that the connection between them is positive and enormous.

Ogboru, Abdulmalik and Park (2018) used ARDL to look at government investment in farming and its effect on decrease employment in Nigeria from 1999-2015. Time series information was accumulated from optional sources on employment rate, government recurrent/capital investment on agriculture, and GDP. The outcome revealed that recurrent and capital consumption does not increase job opportunity and too have no critical impact in Nigeria. Also, Ogbanga (2018) inspected agricultural improvement and employment in Nigeria with the utilization of Error Correction and Granger Causality tests. In any case, the result of the investigation revealed that agrarian sector contributed basically to employment in Nigeria.

Wangusi and Muturi (2015) used OLS to analyze the effects of agricultural spending on rural profitability in Kenya. The outcomes demonstrate that there is a positive and critical connection between agriculture-profitability and government spending to the farming division.

3. Methodology

The study is mainly quantitative research based on regression analysis. Thus, the data for the study was sourced from Central Bank of Nigeria (CBN) statistical bulletin from 1981-2018. The paper adopted both descriptive statistics and econometrics approaches. The descriptive statistics via mean, skewnessetcwas used to analyze the characteristics of the variables under

consideration. The Augmented Dickey Fuller test (ADF) was employed to test for the stationarity of the time series (Dickey & Fuller, 1979). Again, co-integration proposed by Johansen (1998) was used to test for the long run relationship among the variables in the model. Error Correction modeling approach was used to correct the pitfalls of the short run model.

3.1 Model Specification

Theoretical Framework

Theoretically, the study depended on Keynesian hypothesis of employment, which established the connection between government spending in input through labour and capital to generate output through the rate of employment and growth. As per Keynes (1939), public-expenditure can contribute positively to economic growth by increasing government consumption through increase in employment, profitability and investment. The hypothesis additionally holds that administration can switch financial downturns by acquiring cash from the private sector and restoring the cash to private sector through different spending. This theory accepts that dynamic government intervention in the market place through government spending was the main strategy for guaranteeing full employment by guaranteeing proficiency in resource allocation and regulation of markets.

Keynes observed that in the short run, economic growth through full employment is unequivocally affected by absolute spending in the economy. Also, Keynesian hypothesis proposed that our capacity to comprehend what decides the degree of spending will assist us with knowing what decide the degree of employment, production of output and income in the economy. Keynesian hypothesis proposes that Keynesian theory suggests that public expenditure stimulates the economy, decreases joblessness and makes family units feel wealthier based on government spending (Ojong , 2013).

Functionally, Keynesian theory of employment is stated as $Y = f(L, K)$ (1), where; Y is the rate of job creation (employment), L is labour and K is government spending. Conversely, the current econometrics model allows for comparative analysis and is specified thus;

$Q = f(GEc, GHc, GAc)$ (2a)

$Q = f(GEr, GHr, GAr)$ (2b)

The log-linear forms of the models in ECM forms are stated thus;

$$LnQ_t=\beta_0+\Sigma\beta_{1t}LnQ_{t-1}+\Sigma\beta_{2t}LnGEc_{t-1}+\Sigma\beta_{3t}LnGHc_{t-1}+\Sigma\beta_{4t}LnGAc_{t-1}+\pi_1ECM_{t-1}+U \quad (3a)$$

$$LnQ_t=\alpha_0+\Sigma\alpha_{1t}LnQ_{t-1}+\Sigma\alpha_{2t}LnGEr_{t-1}+\Sigma\alpha_{3t}LnGHr_{t-1}+\Sigma\alpha_{4t}LnGAr_{t-1}+\pi_1ECM_{t-1}+U \quad (3b)$$

Where; Q is Job creation (employment), GEc is government capital spending in the education sector, GHc is government capital spending in the health sector, GAc is government capital spending in the agriculture sector, GEr is government recurrent spending in the education sector, GHr is government recurrent spending in the health sector, GAr is government recurrent spending in the agricultural sector, π is coefficient of ECM, $\Sigma\beta_1$and $\Sigma\alpha_1$is current value of job creation in both capital and recurrent spending, Ln is logarithm to base 10.

4. Results and Discussion

Table 1: Descriptive Statistics for Underlying Series

Measurement	Q	GAc	GEc	GHc	GAr	GEr	GHr
Mean	13.423	1627.44	2041.21	1787.18	779.8	777.43	2725.8
Median	12.600	658.0	886.5	684.6	389.9	1848.7	682.6
Std. Dev.	5.4764	1899.6	2277.9	2025.6	829.92	9774.8	3005.2
Skewness	0.7763	1.2500	0.493163	0.494332	0.584174	1.11611	0.43223
Kurtosis	3.1721	5.80611	2.98970	1.902087	2.76286	4.136022	2.233202
Jarque-Bera	3.9257	17.02280	6.336239	5.092014	4.248858	8.968314	6.52867
Probability	0.1764	0.00323	0.069383	0.104915	0.197024	0.018608	0.063018
Observations	38	38	38	38	38	38	38

Source: *Author's Computation from (E- view 9)*

The descriptive statistics reported in Table 1 indicated that the mean of rate of job creation (Q) and standard deviation is 13.423 and 5.4764 respectively. Thus, the standard deviation of job creation is within her mean. Meanwhile, the mean of Government Capital Expenditure in the Agricultural sector (GAc), Government Capital Expenditure in the Education sector (GEc), Government Capital Expenditure in the Health sector (GHc) are ₦1627.44million, ₦2041.21million and ₦1787.18million respectively. Meanwhile, the standard deviation of the aforementioned variables were higher than their respective means. This showed that the variable does not converge around it mean. Similarly, Government Recurrent Expenditure in the Agricultural sector (GAr), Government Recurrent Expenditure in the Education sector (GEr) and Government Recurrent Expenditure in the Health sector (GHr) averaged ₦779.8million, ₦7774.3million and ₦2725.8million respectively. But the standard deviation of the recurrent expenditure variables were higher than their respective means. This showed that the variable does not converge around it mean. Given that the series standard deviation do not converge around their respective mean, it means that the variables were not normally distributed. Thus, the need for stationary test to stabilize the series.

Table 2 Augmented Dickey Fuller Unit Root Test at Level and First Difference

Variable	ADF Test@ Level	Critical Value			ADF Test@ 1ST Diff	Critical Value			Integration Order
		1%	5%	10%		1%	5%	10%	
Q	-1.3074	-3.6267	-2.9458	-2.6115	-9.2664	-3.6267	-2.9458	-2.6115	1(1)
GAc	-1.0578	-3.6329	-2.9484	-2.6128	-11.3195	-3.6329	-2.9484	-2.6128	1(1)
GEc	0.0464	-3.6210	-2.9434	-2.6102	-5.8425	-3.6267	-2.9458	-2.6115	1(1)
GHc	-0.5060	-3.6329	-2.9484	-2.6128	-7.1000	-3.6329	-2.9484	-2.6128	1(1)
GAr	-0.8965	-3.6329	-2.9484	-2.6128	-7.7685	-3.6329	-2.9484	-2.6128	1(1)
GEr	0.3443	-3.6210	-2.9434	-2.6102	-9.7972	-3.6267	-2.9458	-2.6115	1(1)
GHr	-0.3662	-3.6210	-2.9434	-2.6102	-5.5008	-3.6329	-2.9484	-2.6128	1(1)

Source: *Researcher's Computation from (E- view 9)*

The order of integration of each of the series as presented in Table 2 using the ADF tests showed that all the variables were not stationary at level. Thus, the variables were subjected to first difference and they became stationary at first difference. Given the stationarity of the variables, the best regression results was obtained when estimating both co-integration and error correction model.

Table 3 Johansen Co-integration Test Result for Model I

Eigenvalue K=1, r=3	Trace Statistic	5% Critical Value	Prob.**	Hypothesis of CE(s)
0.983560	211.7788	69.81889	0.0000	None *
0.539900	63.88960	47.85613	0.0008	At most 1 *
0.489213	35.94239	29.79707	0.0086	At most 2 *
0.270570	11.75749	15.49471	0.1689	At most 3

*Note: r= number of co-integrating vectors and k = number of lags in model. * rejection of the H0*

Source: *Researcher's Computation from (E- view 9)*

Table 4 Johansen Co-integration Test Result for Model II

Eigenvalue K=1, r=2	Trace Statistic	5% Critical Value	Prob.**	Hypothesis of CE(s)
0.864748	112.0844	69.81889	0.0000	None *
0.475456	47.06220	40.85613	0.2203	At most 1*
0.260935	16.83404	29.79707	0.6523	At most 2
0.148684	5.948758	15.49471	0.7016	At most 3

*Note: r= number of co-integrating vectors and k = number of lags in model. * rejection of the H0*

Source: *Researcher's Computation from (E- view 9)*

The Johansen co-integration test results in the three models as reported in Tables 3 and 4 showed that there are three and two co- integrating equations at 5% level of significance respectively. This is because the Trace Statistic is greater than critical values at 5%. These reasons for the existence of co-integrating equation is not far from the existence of the unit root test at order one. Therefore, there exists a long-run relationship among the variables. Given the existence of co-integrating equations, the requirement for fitting in an error correction model is satisfied.

Table 5: Parsimonious Error Correction Mechanism for Model I (Government Capital Expenditure Model)

Dependent Variable: D(Q)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.402484	0.416366	0.966659	0.3430
D(Q(-1))	0.188485	0.251182	0.750390	0.4600
D(Q(-2))	0.079848	0.200426	0.398392	0.6937
D(Q(-3))	0.153130	0.162489	0.942399	0.3550
DLOG(GAC(-2))	2.554126	1.184877	2.155677	0.0126
DLOG(GEC(-2))	1.315097	0.103101	2.056171	0.0257
DLOG(GHC(-2))	1.445880	0.485047	2.980905	0.0472
ECM(-1)	-0.45198	0.21069	-2.145227	0.0324
R-squared	0.66239	Akaike info criterion		4.51090
F-statistic	5.301620	Schwarz criterion		4.91800
Prob(F-statistic)	0.004692	Durbin-Watson stat		1.78306

Source: *Researcher's Computation from (E- view 9)*

The results of the parsimonious error correction model for model I as presented in Table 5 showed that constant of ECM has the estimated negative sign and statistically significant at 5percent level. Thus, the speed of correction in the long run depicted by the constant of ECM is 0.45198% per year, which implies that 45.2% of the disturbance in the short run is adjusted each year. Also, the R^2 of 0.662% showed that the model is a good fit. Thus, about 66 percent variation in the level of job creation is explained by the systematic changes in the independent variables. The Durbin Watson statistics value of 1.78306 suggests that the model is free from positive first order correlation. Thus, the explanatory variables in the model are not serially correlated.

In the interim, the coefficient of government capital expenditure in the agricultural sector is positively signed and significant with the level of employment at 5 percent level. Thus, a proportion rise in government capital expenditure in the agricultural sector will increase the level of job creation by 2.554126 per cent. Also, given that the variable is statistically significant with job creation, the alternative hypothesis was accepted. The finding here corroborated the empirical work of Adofu, Abula and Agama (2012) on

positive and significant effects of government budgetary allocation to agricultural and employment in Nigeria. Moreover, the coefficient of government capital expenditure in the education sector is positively signed and statistically significant with job creation at 5 percent level. Thus, a proportion rise in capital-expenditure in the education sector will increase the level of employment by 1.581844 per cent. Also, given that the said variable is statistically significant with job creation, the alternative hypothesis was accepted. The finding is instructive has it corroborated Abu and Abdullahi (2010) who studied government expenditure and posited that total capital expenditure on training and research has a significant effect on output and employment creation. Also, the coefficient of government capital investment in the health sector is positively signed and statistically significant with job creation at 5 percent level. Thus, a percentage increase in government capital expenditure in the health sector will increase the level of jobby 1.445880 per cent. Also, given that government capital expenditure in the health sector is statistically significant with job creation, the alternative hypothesis which state that government capital expenditure in the health sector is significant with job creation was accepted.

Table 6: Parsimonious Error Correction Mechanism for Model II (Government Recurrent Expenditure Model)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.381586	0.495539	-0.770042	0.4485
D(Q(-1))	-0.117621	0.259971	-0.452438	0.6549
D(Q(-2))	-0.102151	0.203808	-0.501214	0.6206
D(Q(-3))	-0.060968	0.162324	-0.375595	0.7104
DLOG(GAR(-3))	-0.274055	0.736380	-0.372165	0.7129
DLOG(GER(-3))	2.854098	1.380572	2.067330	0.0492
DLOG(GHR(-3))	3.827970	1.882555	2.033391	0.0528
ECM(-1)	-0.263055	0.127644	-2.060850	0.02901
R-squared	0.583439	Akaike info criterion		4.769805
F-statistic	3.261683	Schwarz criterion		5.183842
Prob(F-statistic)	0.004697	Durbin-Watson stat		1.647444

Source: *Researcher's Computation from (E- view 9)*

The results of the ECM for model II as presented in Table 6 showed that the Alkaike and Schwarz criterion for the model are 4.7698 and 5.1838 respectively. The coefficient of ECM has the postulated negative sign and statistically significant at 5% level. Thus, the speed of correction in the long run depicted by the constant of ECM is 0.263055% per year, which implies that about 26% of the disturbance in the short run is corrected each year. Also, the R^2 of 0.583% showed that the model is a good fit. Thus, about 58 percent variation in job creation is explained by the changes in the independent variables. The Durbin Watson statistics value of 1.647 suggests that the model is free from positive first order correlation. Thus, the explanatory variables in the model are not serially dependent.

Meanwhile, the coefficient of government recurrent expenditure in the agricultural sector is negatively signed and statistically not significant with job creation at 5 percent level. This does not conform to hypothesized economic theory. Therefore, a rise in government recurrent expenditure in the agricultural sector will reduce the level of job creation by 27.4 per cent. Also, the null hypothesis which state that there is no significant relationship between government recurrent spending in the agricultural sector and job creation was accepted. The findings is in line with the empirical work of Ogboru, Abdulmalik and Park (2018) who opined that government recurrent expenditure in agriculture does not increase employment significantly in Nigeria. Also, the coefficient of government recurrent expenditure in the education sector is positively signed and statistically significant with job creation at 5 percent level. Government recurrent expenditure in the health sector is positively signed but statistically not significant with job creation at 5 percent level. Thus, a proportion rise in recurrent expenditure in the health sector will increase the level of job by 38.2 per cent. Also, given that recurrent expenditure in the health sector is statistically not significant with employment rate, the null hypothesis was accepted. The finding is in line with Amassoma, Nwosa, and Ajisafe (2011) who in their study on public recurrent expenditure on health has an insignificant effect on employment.

4.1 Comparative Analysis Based on the Government Capital and Recurrent Spending in the Selected Sectors.

This section discusses the best model based on the outcome of the Alkaike and Schwarz criterion. This is because according to Muhammad-Saeed (2010), in comparison of two or more estimated models, the model with the lowest Alkaike and Schwarz criterion is the best model. Thus, from the analysis model I, the Alkaike and Schwarz criterion values are 4.5109 and 4.918 respectively. Similarly, model I is the best model as it has the lowest Alkaike and Schwarz criterion, all the variables were positively signed and the explanatory power of the model (R^2) of 66% is the highest. It also showed the highest proportion contribution to employment generation during the studied period. Therefore, in the long run, government capital expenditure will address the pitfalls in the country employment. The finding here validated the empirical work of Abu and Abdulahi (2010) as well as Adofu, Abula and Agama (2012) whose empirical works on sectoral government budgetary and employment in Nigeria, affirms that budgetary allocation in term of capital expenditure to agriculture and education sectors has positive and significant effect on employment in Nigeria.

Meanwhile, the result of model II which represents the recurrent expenditure model, showed that the Alkaike and Schwarz criterion values are 4.7698 and 5.1838 respectively. Also, the R^2 is 58%. But government recurrent spending on agriculture and health have insignificant impact on job creation. The findings is in tune with the empirical work of Ogboru, Abdulmalik and Park (2018) who averred that government recurrent expenditure on agricultural and health sectors does not increase employment rate.

5.0 Conclusion

This paper examined a comparative analysis of the effect of government spending in selected sectors on job creation from 1981 to 2018. The study was induced by the deficient and instability in federal government budgetary portions to some critical sectors such as agriculture, education; and health sectors that tend to prompt the neglect of agricultural sector, deterioration in the academic standard as well as decay in the health care service. Thus, time series data were collected from CBN bulletin from 1981-2018 on variables

such as job creation proxy by employment rate, capital and recurrent government expenditure on agriculture, education, and health, sectors. The co-integration and ECM methods were used for the analysis.

Based on the findings, it is recommendedthat since education is complementary to every sector of the economy, Nigeria government should take advantage of the high interest of Nigerians in academic skills to expand the economic base by providing enough capital funds to education for proper utilization of potential productive and social benefits. Crucial effort should be made by government in directing more assets to the healthsector so as to improve wellbeing standard, decrease the death rate and consequently life expectancy of the citizen. Nigeria government should increase her budgetary allocation to the agricultural sector to allow for economic diversification from oil based. This is because of its importance to the national economy. Similarly, government budgetary allocation to the agricultural sector should be in infrastructural facilities such as good road network and steady electricity in the rural areas where we have bulk of our farm produce.

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TECHNOLOGICAL ADVANCEMENT AND ECONOMIC GROWTH IN NIGERIA

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Abstract

This study examines the nexus between technological advancement and economic growth in Nigeria employing a sample splitting and threshold approach from 1981 to 2014. Economic growth as the dependent variable was proxy by Gross Domestic Product (GDP). Federal Government Expenditure (GE), Gross Fixed Capital Formation (GFCF), Trade Openness (TO), Exchange Rate (EXR), and Total Factor Productivity (TFP) were used as the independent variables. Data for the study were obtained from the Penn World Table and World Development Indicators, 2017, respectively. The threshold test indicated the existence of a threshold point, estimated to be 0.8452. The results showed that in the absence of technological advancement or when it is below the threshold point, an addition to the existing stock of capital could derail economic growth; however, if technological progress is beyond the threshold point, all the macroeconomic variables would be growth-enhancing. Based on the findings of this study, a macroeconomic framework that incorporates technological advancement as an integral component is recommended. This could be achieved in Nigeria through investments in ICT infrastructure as well as research and development, the internalization of technologically-driven services, and the adoption of modern transportation systems propelled by technology. This recommendation is plausible because technological progress is paramount for sustained long-run economic growth in Nigeria.

Key words: Technological Advancement, Sample Splitting, Threshold Regression and Economic Growth.

1. Introduction

Technological advancement from the 18th century has remained the engine of economic growth and development. Technology continues to transform the global economy resulting in remarkable changes in the way humans work, interact and live. Technological progress not only lowers the cost of production, but also enhances productivity thereby creating enormous economic gains for countries internalizing it in their macroeconomic master plan (Caliskan, 2015). Therefore, its pivotal role in sustaining long-run growth has generated serious research interests over the years.

The debate among researchers and policy makers revolves around how technological progress accounts for the differences in economic growth across countries and over time. The idea of technological advancement driven by inventions and innovations is attributed to Schumpeter (1912), who argued that innovation prompts a new business to replace old ones. Subsequently, technology was considered in the Solow growth model as a driver of long-run growth of output per worker. Certainly, it is a plausible argument that technological progress is the reason more output can be produced today from a given quantity of capital and labor than could be produced a century ago (Romer, 1996). However, a major drawback of the Solow growth model stems from the assumption that technological progress in the production function is random and exogenous.

Dissatisfied with the Solow's postulation, recent studies on technological progress have been anchored on endogenous growth theory, arguing that long-run growth rate of output per worker is determined by variables within the model, including technological progress (see Carlaw and Lipsey, 2003; Effiom, 2011; Alani, 2012; Awosusi and Awolusi, 2014; Adak, 2015; Calistan, 2015; Akinlo and Adejumo, 2016). The vast literature on endogenous growth theory is built on the foundation of earlier works by Arrow (1962), Romer (1986), Lucas (1988), Romer (1990), Grossman and Helpman (1991), Aghion and Howitt (1992), Barro and Sala-i-Martin (1995), and Young (1998). The model emphasizes increasing returns to scale due to technological improvement which results from the rate of investment, size of capital stock and the stock of human capital (Ahuja, 2000). It is also argued that advances in technical knowledge are essential for growth, and their existence in an economy arises from the purposeful actions of economic agents seeking returns on their investments (Grossman and Helpman, 1991).

Essentially, various channels have been articulated in the literature through which societies accumulate knowledge, including but not limited to formal education, on-the-job training, basic scientific research, learning by doing as well as process and product innovations (Aghion and Howitt, 1992; Grossman and Helpman, 1994). The knowledge so acquired enables individuals to perform a given function more effectively (Nelson and Phelps, 1966). Therefore, education, be it formal or informal, is necessary both for home

grown technology, and for the adoption and adaptation of foreign technology (Mayer, 2001; Akinlo and Adejumo, 2016).

More so, another vital component of the endogenous growth theory is inherent in the proposition that technological change occurs in large part due to deliberate actions taken by investors who respond to market incentives (Romer,1990). It follows that conscious investment in education, training, research and development are necessary to engineer technological progress. There is a consensus in the literature that technological advancement promotes economic growth, though its impacts vary across economies (Romer, 1990; Aghion and Howitt, 1992; Grossman and Helpman, 1994, Carlaw and Lipsey, 2003; Caliskan, 2015; Akinlo and Adejumo, 2016).

However, Nigeria, like most developing countries, may not benefit from technological progress if the level of technological advancement that enhances economic growth is not identified. Such observed threshold level of technological progress would guide policy makers and investors on where to channel investments that boosts growth either through improved investment in education or via research and development (R&D) activity. Eventually, human capital would become more productive and technological progress could sustain growth in the country (Akinlo and Adejumo, 2016). Besides, for decades, the global argument has been on the relationship between technological progress and economic growth. There has been little or no attempt to articulate a threshold level of technological advancement that can spur or derail economic growth. It is against this background that this study is carried out to examine a threshold level of technological advancement that is growth-enhancing; particularly, in the context of a developing country like Nigeria.

The rest of the paper is organized as follows: section two reviews relevant literature and theoretical framework, while section three contains methodology. Section four presents the results and discussion of findings, while section five concludes with recommendations.

2. **Review of Related Literature**

In an attempt to identify the macroeconomic factors that propel sustained long-run economic growth, several theoretical postulations have been

advanced. This study is anchored on the theoretical expositions of the Neoclassical and New growth theories. These schools of thought identify technological advancement as the catalyst for long-run economic growth. The point of departure between these two schools of thought stems from their consideration of how technological progress enters the production function. While the Neoclassicists believe that technological progress enters the production function exogenously, the New growth theorists argue the technological advancement influences output endogenously.

The Neoclassical growth theory first appeared in the works of Solow (1956) and Swan (1956). Over time, an ambit of intellectual debate about factors that influence growth was created. They argued that technological progress is exogenously determined and as such, it is independent of other factors of production. Technological advancement therefore enters the model through a multiplicative process, signifying that technology only serves to augment labour productivity. Solow (1991) argued that in the long run, output growth per worker depends on the extent of labour-augmenting change in technology driven by factors outside of the production function. Evidently, the Neoclassical model emphasizes the fact that all economies employing similar technology have growth potentials to converge in productivity over time.

The fundamental Solow (1956) model indicates that output (Y) is determined by the availability of capital (K), labour (L) and knowledge (A), otherwise called effectiveness of labour. In other words,

$$Y = K^{\beta}(A_t L)^{1-\beta}, \; 0 < \beta < 1 \qquad 1$$

Given the assumption that the production function exhibits constant returns to scale, it is argued that capital and labour are prone to diminishing marginal returns independently. Solow and Swan (1956) opined that although the accumulation of capital enhances economic growth, it only occurs along the path of transition to the steady state. This is because at this stage of growth, other factors of production grow at the same rate.

Essentially, the exogenous growth model asserts that though the accumulation of capital and labour encourage economic growth, it is technological advancement that sustains long-run economic growth. It is however important

to note that by treating technological progress as an exogenous component of the growth process, scholars have sought to advance a framework that captures technological advancement in the production function. Particularly, the New growth theory is designed to correct the observed inconsistency in the exogenous growth model.

The early exposition of the endogenous growth model is found in Arrow (1962), Romer (1968) and Lucas (1988). The basic argument of the New growth theory is that output growth (ΔY) depends on the behaviour of accumulated physical capital component (K), human capital (Hc) and technological advancement (ΔA) which is determined endogenously. The proponents of the New growth theory believe that although capital and labour in a given firm exhibit constant returns to scale, an economy is propelled to its long-run growth potentials when there are positive spillovers from technological progress. In other words,

$$\Delta Y = f(K, Hc, \Delta A) \quad 2$$

Particularly, Romer (1994) pointed out that the endogenous growth model encompasses various theoretical and empirical underpinnings that seek to extend the factors influencing growth beyond the parochial consideration of a residual as the accounting for growth differentials among the economies of the world. Also, Romer (1994) suggested that technological progress perpetuates and accelerates economic growth because the world will continue to foster inventions and innovations.

Sequel to the arguments advanced by Solow (1956) about the possibility of economies converging globally given technological advancements, Romer (1986) and Lucas (1988) observed that if the espoused convergence is not actualized, then for economies to globally converge, the rate of growth must be endogenously driven. Following Arrow (1962), Uzawa (1965) adduced that to obliterate the constraints imposed on capital resulting from diminishing marginal returns, annual output growth must be triggered by an existing quantum of capital stock and labour; hence, all improvements in technological knowledge are embedded in labour. Therefore, enhanced labour efficiency is not only driven by the amount of capital engaged in the production process but also the structure of health, education, construction and the sustainability of

public goods. Similarly, Barro and Sala-I-Martin (1995) opined that human capital development through education eliminates the constraints of diminishing returns to capital; and thus, long-run growth per capita can be achieved if technological advancement is endogenous.

Finally, following these theoretical postulations, it is evident that the focal point of the various expositions is to identify the factors that foster long-run economic growth. Whereas the Neoclassicists believe that long-run economic growth can be attained when technological advancements are exogenously driven especially during a transition stage while the New growth theorists opine that sustained long-run growth is realized when technological progress is endogenous. These arguments have engendered profound research interests in the theorization of the growth accounting process. This study attempted to integrate both theories to examine the level of technological advancement that will guarantee sustained economic growth in Nigeria.

The increasing rapid rate of technological process has made the analysis of the empirical relationship between technology and the economic activities more complex with potential positive and negative impacts. In view of the importance of technology to economic activities, as well as the continuous rapid levels of technological advancement since the beginning of the 20th century, a number of studies have been carried out to determine the nature of the relationship between technology and economic activities and one of such study was by Li and Florida (2006). They evaluated the relationship between talent, technological innovation and economic growth in China. Technological innovation was measured using the total amount of invention patents approved for a city by the China`s State Intellectual Property Office before the 20th of September 2005. The results showed that talent had a positive and non-significant impact on regional output in China. On the other hand, technological innovation had a positive and significant impact on regional output in China. In another study by Adak (2015) which examined the impact of technological progress and innovation on economic growth in Turkey using the Ordinary Least Squares (OLS) estimation, total patent applications and technology imports were used explanatory variables. The result showed that total patent applications had a positive and significant impact on economic growth while technological imports have a significant impact on the total number of patents in Turkey.

In a similar vein, the study by Alani (2012) also investigated the impact of technological progress and productivity in Uganda. The study covered the period 1971 to 2009. The results revealed that growth in technology, labour and capital stock have a positive and significant impact on economic growth in Uganda.

Kabanda (2010) examined the effect of information and communication technologies (ICT) on the attainment of millennium development goals in South and Eastern Africa. The study was based on the use of both primary and secondary data. The analysis was carried out using the qualitative method of analysis and the correlation technique and t-test. The results revealed the existence of a strong correlation between the diffusion of ICT and economic growth in South and Eastern Africa.

Amavilah (2007) studied the impact of technology-as-knowledge on economic performance in South Africa, Namibia and Botswana. The study covered the period 1976 to 2004. The knowledge underpinning of technology was captured through the use of the number of papers published. The result revealed the existence of a strong correlation between the number of publications and economic performance in the three countries.

Bujari (2016) employing generalized method of moment (GMM) for 12 selected countries in Latin America reported that technological innovation exerts a positive impact on economic growth in the region. The results of the study further suggested that the region could achieve tremendous economic growth if technological drives were properly incentivized. The study recommends increased investment in research and development (R&D), patents as well as improved market for the export of high-tech products, thereby raising total factor productivity and boosting per capita GDP in the countries. Similar results are found in Hodrah, Maitah and Lubos (2016) for the Arab countries; Aghaei and Rezagholizadeh (2107) for the Organization of Islamic Conference (OIC); Sepehrdoust (2018) for developing economies of the Petroleum Exporting Countries (OPEC); and Pradhan, Mallik and Bagchi (2018) for the G-20 countries.

Recent studies have also revealed the growth-enhancing potentials of technological progress. These authors adduced that technological innovations

driven by ICT have positive and significant impact on economic growth (*see* Adeleye and Egboagu, 2019; Bahrini and Qaffas, 2019, for 54 countries in Africa, and Middle East and North Africa (MENA) region, respectively).

There is also a gamut of literature on the subject matter in Nigeria. One of the studies on the impact of technology on the Nigerian economy was carried out by Posu (2006) that studied the impact on Information and Communication Technology (ICT) on the Nigerian economy. The study covered the period 199 to 2004, while the analysis was carried out using the Ordinary Least Squares (OLS) method of estimation. The results showed that investment in the telecommunications sector has a positive and significant impact on economic growth in Nigeria. Number of personal computers also had a positive and significant impact on investment in telecommunications sector in Nigeria. Awosusi and Awolusi (2014) also investigated the nexus between technological transfers and economic growth in Nigeria from 1970 to 2010. Vector Error Correction Model (VECM) and Granger causality test were employed for model estimation. Technology transfer was captured using imports of machinery. The results showed that though there is bidirectional causality between foreign direct investment and economic growth in Nigeria, economic growth in Nigeria is sustained by technological transfers. Muhammad and Kebbi (2014), Oluwafemi (2015), and Ugwuanyi (2017) arrived at the same conclusions recommending the prioritization of critical ICT infrastructure as a catalyst for economic growth in Nigeria.

Finally, the nexus between technology and economic growth has been extensively investigated over the years as evident in the reviewed literature. However, none of these studies has examined a threshold level of technological advancement that guarantees economic growth, especially in a developing country like Nigeria (*see* Posu, 2006; Awosusi and Awolusi, 2014; Muhammad and Kebi, 2014; Oluwafemi, 2015; Ugwanyi, 2017; Adeleye and Egboagu, 2019). It has therefore become relevant to ascertain the level of technological progress that could trigger sustained long-run economic growth in the country.

3 Method of Study

3.1 **Analytical Framework**

The quantitative nature of the series involved in the study made the ex-post facto research design the approach of choice. This research design has an in-built mechanism to examine the causal effects underlying the behaviour of the basic macroeconomic indicators employed in this study.

This study is anchored on the new growth theory which is pivotal to examining the level of technological progress that triggers long-run economic growth. Based on the theoretical presentations by Solow (1956), Romer (1986) and Lucas (1988), a modified model for this study is advanced as follows:

$$GDP = f(GE, GFCF, TO, EXR, TFP) \quad 3$$

The variables as expressed in equation (3) are defined as GDP (gross domestic product), GE (national government expenditure), GFCF (gross fixed capital formation), TO (trade openness), EXR (exchange rate), and TFP (total factor productivity). This study deviates from earlier ones by incorporating other relevant variables not captured in (3); thus, the model is re-expressed as:

$$GDP_t = \eta_0 + \eta_1 GE_t + \eta_2 GFCF_t + \eta_3 TO_t + \eta_4 EXR_t + \eta_5 TFP_t \quad 4$$

The expression in (4) puts in the natural log form becomes:

$$\lg dp_t = \eta_0 + \eta_1 \lg e_t + \eta_2 \lg fcf_t + \eta_3 lto_t + \eta_4 exr_t + \eta_5 ltfp_t + \varepsilon_t \quad 5$$

The variables in (5) are as already defined. The coefficients to be estimated are η_1 to η_5, with η_0 being the constant term. ε_t represents the stochastic component. It is expected a priori that η_1, η_2, η_3 and $\eta_5 > 0$, while $\eta_4 < 0$, given that an overvalued currency could shrink the growth of the economy.

3.2 **Description of Variables in the Model**

(a) **Gross Domestic Product:** This is the total monetary value of all final goods and services produced in an economy irrespective of the nationality of the producers in a given accounting period usually a year. It is explored in this

study as the dependent variable as well as a measure of economic growth. The data is sourced from the Penn World Table, 2017.

(b) **Government Expenditure**: This refers to the spending by the federal government. Government expenditure is expected to have a positive relationship with economic growth in Nigeria. The data is obtained from the Penn World Table, 2017.

(c) **Gross Fixed Capital Formation**: this measures the net growth in physical assets of an economy within a given accounting period. It is also regarded as national investment; and thus, a rise in investment which constitutes an injection into the circular flow of income is expected to propel economic prosperity. The data is sourced from the World Development Indicators (WDI), 2017.

(d) **Trade Openness**: This is used as an indicator of the Nigeria`s trade policy. It is an indicator of the willingness of a country to engage in trade with other countries. Trade openness in measured using the ratio of imports and exports to GDP. Trade openness is expected to have a positive relationship with economic growth in Nigeria. The data is obtained from the WDI, 2017.

(d) **Exchange Rate**: This is the rate at which a country's currency is traded for another. The rate is captured using the naira-dollar exchange rate. Exchange rate is expected to have a negative relationship with economic growth in Nigeria. The data is also sourced from the WDI, 2017.

(e) **Technological Advancement**: It refers to improvement in the knowledge and skills applied to the production of goods and services. In this study, technological progress is captured using total factor productivity. This is hinged on the argument that technology augments labour and capital. The use of technology in this study is also informed by the Endogenous growth theory. Technology is expected to have a positive impact on economic growth in Nigeria. Low total factor productivity indicates that labour and capital are effectively and efficiently utilized in the production process, and vice-versa if the value is high. This is because the total factor productivity reports the proportion of output not captured by the quantum of inputs engaged in production. The total factor productivity is obtained from the Penn World Table, 2017.

In summary, annual time series spanning from 1981 to 2014 were employed for this study. The data were sourced from the Penn World Table, 2017 and the World Development Indicators (WDI), 2017.

3.3 **Estimation Technique**

The fundamental objective of this study is to examine the threshold of technological advancement that will guarantee long-run economy growth in Nigeria. In order to achieve this lofty objective, a sample splitting and threshold regression approach is employed (see Hansen, 2000).

(a) **Sample Splitting Test**

The sample splitting and threshold test[1] is proposed to help ascertain the upper and lower quantile or threshold point that will be appropriate for carrying out the splitting of the sample and the threshold regression. By splitting the sample, unit root test becomes irrelevant. However, a heteroscedastic problem may arise due to asymptotic sample bias. But the threshold test is robust since it has an in-built mechanism for correcting asymptotic bias. Therefore, the problem of heteroscedasticity is addressed through a bootstrap procedure (Hansen, 2000).

(b) **Sample Splitting and Threshold Regression**

Having identified a threshold point, a sample splitting and threshold regression[2] is conducted. The data is thus splitted for a threshold regression taking into account the upper and lower quantiles. Hansen (2000) argues that the approach considers the ordinary least squares (OLS) estimates of the regression. It is anchored on an asymptotic distribution that facilitates the identification of the coefficients. In this approach, the likelihood ratio is inverted to generate asymptotic confidence intervals. The threshold has an in-built Monte Carlo simulation mechanism that enhances the precision of assumptions asymptotically.

4. **Empirical Data Analysis**

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[1] The threshold test for this study (utilizing stata software) is expressed as: thresholdtestlgdplgfcfto exr, q(tfp) trim_per(0.15) rep(5000).

[2] The sample splitting and threshold regression for this study is given as: thresholdreglgdplgfcfto exr, q(tfp) h(1).

The empirical results are obtained by first carrying out a threshold test to determine whether there is a unique threshold in the variable of interest (in this study, technological progress). Once the threshold test is conducted and a particular point observed, the threshold regression is performed. All this gives a global OLS result as well as results for when technological progress is above or below threshold level. The various results are thus presented and analyzed as follows.

4.1 **The Threshold Test**

The result of the threshold test is presented in table 1.

Table 1: **The Threshold Test Result**

Number of Bootstrap Replications:	5000
Trimming Percentage:	0.15
Threshold Estimate:	0.8452
LM-test for no Threshold:	14.86909
Bootstrap P-value	**0.0038**

Note: *Test of Null of no Threshold against Alternative of Threshold allowing Heteroscedastic Error (White Corrected)*

Source: Authors' Computation from research data (2019).

The threshold test as presented in Table1 indicates that the bootstrap p-value is significant; and thus, the null hypothesis of no threshold point is refuted. The results further show that 0.8452 represents the estimated threshold point that is employed for the threshold regression. The bootstrap procedure corrected the asymptotic bias that would have been created due to small sample size.

4.2 **The Global Ordinary Least Squares (OLS) Estimation Results without a Threshold Level**

The plausibility of the threshold analysis stems from its capacity to establish the basis for comparing results from ordinary least squares estimation with or

without a threshold point. The results of the global OLS estimation is shown in table 2.

Table 2: Sample Splitting and Threshold Regression Result

Independent Variables	**Coefficient**	**t-Statistic**	**P-value**
LGE	0.605***	2.97	0.006
LGFCF	-0.111	-0.90	0.377
TO	0.464**	2.05	0.049
EXR	0.003***	3.17	0.004
R-squared: 0.99			
Adjusted R-squared: 0.98			
F(4, 9) = 218.93, Prob> F = 0.0000			

*Note: The Global Ordinary Least Squares (OLS) Estimation, Without Threshold (Heteroscedasticity Correction Used); ***, **, and * represent the level of significance at 1%, 5% and 10%, respectively.*

Source: Authors' Computation from research data (2019).

As presented in Table 2, the global ordinary least squares estimation results shows that federal government expenditure, trade openness and exchange rate are statistically significant, but gross fixed capital formation is insignificant. Whereas federal government expenditure and exchange rate are significant at 1 percent level of significance, the trade openness is significant at 5 percent. Evidently, Table 2 indicates that 1 percent increase in federal government expenditure will lead 0.61 percent rise in gross domestic product; a unit increase in trade openness engenders enhances economic growth by 46.4 million US dollars, and a fall in the value of the local currency by 1 unit increases the gross domestic product by 0.3 million US dollars. There is however an inverse relationship between economic growth and gross fixed capital formation, though it is insignificant. A 1 percent rise in fixed capital formation brings about a decline in GDP by 0.11 percent; this plummeting impact of increasedfixed capital formation on economic growth is a reflection of diminishing returns to capital argued by Solow (1956) in the absence of technological progress. The adjusted R-squared of 0.98 shows that the model has high explanatory power, with about 98 percent of the total variation in the

gross domestic product being explained by the dynamics of federal government expenditure, gross fixed capital formation, trade openness and exchange rate; also, the 0.02 percent unaccounted for is captured the error component. Finally, the statistical significance of the F-statistic value (218.93) shows that the overall model has a good fit and will be relevant for inference.

4.3 **When the Level of Technological Advancement is Less than the Threshold Point**

Having established the threshold point, it is necessary to investigate the behaviour the series when the technology does not grow beyond the threshold level. The results are indicated in Table 3.

Table 3:Technological Advancement and the Threshold Point (Regime 1)

Independent Variables	**Coefficient**	**t-Statistic**	**P-value**
LGE	0.663**	2.62	0.019
LGFCF	-0.310	-1.58	0.136
TO	0.419*	2.05	0.059
EXR	0.003**	2.78	0.014
R-squared: 0.89			
Adjusted R-squared: 0.86			
F(4, 15) = 30.01	Prob> F = 0.0000		

*Note: ***, **, and * represent the level of significance at 1%, 5% and 10%, respectively.*

Source: Authors' computation from research data

As reported in Table 3, the results indicate that with technological progress below the threshold point, 1 percent increase in federal government expenditure leads to 0.663 percent increase in GDP (about 0.058 percent improvement in economic growth) compared to its previous contribution (0.605 percent) to GDP in the absence of technological advancement. The value of the GDP for the period under consideration fell by 0.31 percent following a 1 percent rise in gross fixed capital formation. Trade openness also improves significantly with technology by contributing about 41.9 million US dollars to the overall GDP of Nigeria. Technological progress leaves the value of exchange rate unchanged; this is because the utilization of technology

is below the threshold point of 0.8452. Essentially, while federal government expenditure, trade openness and exchange rate are statistically significant, the gross fixed capital formation is not significant. The adjusted R-squared value of 0.86 indicates that the model also has tremendous explanatory power, with 86 percent of the changes in GDP being explained by variations in the regressors; and the 14 percent unaccounted for is captured by the stochastic term. The F-statistic value shows that the model also has a good fit and it is well behaved.

4.4 **When the Technological Advancement and the Threshold Point (Regime 2)**

The results of the threshold regression when technological progress is beyond the threshold point is reported in Table 4.

Table 4:Technological Advancement and Threshold Point

Independent Variables	**Coefficient**	**t-Statistic**	**P-value**
LGE	0.667***	3.87	0.004
LGFCF	0.013	0.14	0.893
TO	0.345	0.86	0.413
EXR	0.005***	4.88	0.001
R-squared: 0.99			
Adjusted R-squared: 0.98			
F(4, 9) = 218.93		Prob> F = 0.0000	

*Note: ***, **, and * represent the level of significance at 1%, 5% and 10%, respectively.*

Source: Authors' computation from research data

With technology improving beyond the threshold point, Table 4 shows that federal government expenditure, gross fixed capital formation, trade openness and exchange rate, all have positive impact on economic growth as proxy by GDP. The results further indicate that 1 percent increase in federal government spending improves economic growth by 0.667 percent. A 1 percent growth in gross fixed capital formation leads to 0.013 percent rise in GDP; and a unit increase in both trade openness and exchange rate results in 34.5 million US

dollars and 0.5 million US dollars increase in GDP, respectively. The results however show that while federal government expenditure and exchange rate are statistically significant, gross fixed capital formation and trade openness are not significant. With the improvement in technology, it is expected that over time economic growth will be sustained in the long-run. Also, the values of the adjusted R-squared and the F-statistic indicate that the model has high explanatory power and goodness of fit; and thus, the model is relevant for inference.

4.5 **Discussion of Findings**

The results of the threshold test showed that the series have a threshold point. The estimated threshold point was 0.8452. The bootstrap mechanism corrected for asymptotic bias due to small sample size. This finding is plausible as it provided a spring board for the threshold regression to be carried out through a sample splitting procedure. The Global Ordinary Least Square estimation without threshold but corrected for heteroscedasticity bias indicated that federal government spending and trade openness had positive significant impact on the economy as proxy by GDP. The negative impact of the gross fixed capital formation on economic growth showed that without technological progress an addition to the stock of capital can only lead to diminishing returns to capital and a decline in output; a view avowed by both the neoclassicists and the new growth proponents (see Solow, 1956; Arrow, 1962; Romer, 1986; Lucas, 1988).

Evidently, with the introduction of technology into the model, all the variables except exchange rate had positive impact on GDP. But the increase in gross fixed capital formation resulted in the plummeting of growth in the economy as technological improvement was below the threshold point of 0.8452. Following improvement in technological use beyond the threshold point, the estimated results indicated that federal government expenditure, trade openness as well as gross fixed capital formation had positive impact on growth. However, the appreciation of the exchange rate is a clarion call to the monetary authorities to effectively and efficient manage exchange rate policy in order not to stifle with growth while enhancing the employment of technology through diffusion to boost economic growth.

Furthermore, the results as reported in Tables 1 to 4, aggregate federal government spending, gross fixed capital formation and trade openness conformed to their a priori expectations, especially when technology was fully harnessed. On the other hand, exchange rate negated its a priori expectation, signaling the relevance of pursuing a purpose-driven monetary policy.

Finally, the empirical findings of this study has profound policy relevance in the pursuit of long-term economic growth. The results imply that for economic prosperity to be sustained in Nigeria, the economy should be technologically driven, fundamentally through technology diffusion. As evident in the results, technological advancement above the threshold point will propel growth in all the components of the economy. This argument is plausible because with improvement in the utilization of technology, federal government spending, gross fixed capital formation and trade openness contributed positively to the overall growth of the economy during the period under consideration.

5. **Conclusion and Recommendation**

Fundamentally, the study examined the nexus between technological advancement and economic growth in Nigeria from 1981 to 2014. A sample splitting and threshold regression approach was employed for the study. The threshold test indicated that the series exhibited a threshold point estimated to be 0.8452. The bootstrap p-value was highly significant which further supported the existence of a threshold point. The in-built bootstrap procedure in the threshold approach helped to boost the accuracy of the asymptotic distribution; and thus, the problem of heteroscedasticity was not envisaged.

The global ordinary least squares estimation indicated that without technological advancement, an addition to the existing stock of capital would be counterproductive because of diminishing returns to capital even as other key macroeconomic variables were growth-enhancing, proxy by GDP.Also, the negative impact of an addition to capital stock was more profound when technological progress was not fully harnessed, and as such was below the threshold point; the output declined further by about 0.21 percent.

Evidently, the advancement of technology above the threshold point was a watershed on economic growth. Federal government spending, gross fixed capital formation, and trade openness were all growth-enhancing, buttressing

the fact that technological progress serves as a catalyst for long-run economic growth. The estimated value of exchange rate showed that with technology being fully explored, it could appreciate overtime, hence an effective exchange rate management is recommended.

Finally, the findings of the study are similar to conclusion of the New growth theorists that by making technological advancement endogenous, long-run economic growth would be sustained. A view shared by Posu, 2006; Awosusi and Awolusi, 2014; Muhammad and Kebi, 2014; Oluwafemi, 2015; Ugwanyi, 2017, Adeleye and Egboagu, 2019. The study therefore recommends a policy framework that incorporates investments in education, ICT infrastructure as well as research and development, the internalization of technologically-driven services, and the adoption of modern transportation systems propelled by technology.

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DEPOSIT MONEY BANKS' CREDIT AND AGRICULTURAL OUTPUT IN NIGERIA

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Abstract

This study examines the impact of Deposit Money Banks' credit on agricultural output in Nigeria between 1980 to 2017. The data for the empirical analyses were extracted from the Central Bank of Nigeria Statistical bulletin (various issues). The study obtained Agricultural contribution to Gross Domestic Product(AGDP) to proxy agricultural output while Deposit Money Banks' credit to agricultural sector (DMBC) was the primary independent variable while (INR) and (GEA) were used as check variables to promote the independent power of the model. Descriptive statistics, unit root test, co-integration and Error Correction Model (ECM) methods of analyses served as the analytical tools. From the empirical analysis of the results, the paper concludes that there is an insignificant inverse link between Deposit Money Banks' credit to agricultural sector and Nigerian agricultural output. The outcome also explained that government expenditure on agriculture had a significant negative effect on agricultural production in Nigeria. Again, the result explains that an inverse and insignificant relationship exist amongst interest rate and Nigerian agricultural output. It is therefore suggested that a state of emergency be declared in Nigeria's agricultural sector so as to optimise its inherent benefits. This can be obtained through government's increasing her budgetary allocation to the agricultural region in-line with the provisions of Food and Agricultural Organisation (FAO) and also constructing of a monitoring team to ensure that the allocated fund is judiciously utilized.

Keywords: Credit, Government Spending, and Agriculture

1. Introduction

The Nigerian economy was mostly pushed by the agricultural sector precisely in the 1960s but later reduced along the past three decades. The sector also added about 65 percent of job recruitment and estimated for over 90 percent of the total food utilization demand, thus adding significantly to the society's food preservation (Olajide, Akinlabi, and Tijani, 2012; Emeka, 2007 andIzuchukwu, 2011). The agricultural region of Nigeria is predicted to be the biggest donor to Nigeria's non-oil foreign revenue (Iganiga and Unemhilim, 2011). The sector is also seen as the skeleton to the expansion of the economy through market enlargement, foreign exchange addition, and product increase. (Abayomi, 1997).

However, in recent times, the achievement of the agricultural sector and its part of improvement to the nation's GDP has awfully diminished following the oil boom of the 1970s (Olajide et al, 2012). In addition, components such as falling standard of learning and dearth of critical infrastructures have also attend to the impoverished achievement of the sector (Pudasaini, 1983; Quuliroz and Gautam, 1992). Other factors inhibiting agriculture in Nigeria comprises of lack of credit facilities and current inputs (Iganiga andUnemhilim et al, 2011;Zakaree, 2014), faulty research and extension services, land and natural deterioration, (Olajide et al, 2002). Among these factors scarce capital and inadequate credit facilities which seem to be the basic issues plaguing agriculturein Nigeria.

Despite the dismal agricultural performance occasioned by poor funding, the CBN (2011) cited inUdoka, Mbat and Duke (2016) are of the view that the Nigerian agricultural sector have access to higher credit from the commercial banks (now, Deposit Money Banks, DMBs) which is about ₦7million in credits in 1970 and in 1975 about ₦37.4 million in credits . In 1980, the fund which was distributed by the commercial banks to the agricultural sector increased to ₦462.2 million, representing 7.28 percent of the entire credit and in 1985, total commercial bank's credit to agriculture rose further to ₦1310.2 million and constituted 10.77 percent of the overall credit by the commercial banks. By 1990, total credit to agriculture rose to ₦4221.4 million and constituted 16.24 percent of the total credit in the economy and expanded further to ₦25, 278.7 million in 1995, which also alleged for about 17.49 percent of the full credit allocated to the economy. By 2012, budgeted credit to agriculture has grown to 316,364 million, mirroring 3.9 percent of the commercial bank summed credit. Agricultural credit skyrocketed from ₦343,696.80 million in 2013 to ₦478, 911.78 million in 2014 depicting 8.7 percent of commercial bank entire credit.

From the proceeding analysis as pointed out by Udoka, Mabat and Duke (2016), it can be assured that nevertheless total credit to agriculture has been growing in infinite terms but when calculated based on percentage contribution in sum credit to the economy, credit to agriculture constitute an insignificant rate of the total credits, and this aforementioned has led to a drop in the annual growth rate of agriculture. This suggest a disconnect between the duo of agriculture and addition to economic expansion. This observation

amongst other call for a re-think of the continual problem of agricultural funding in Nigeria. Ideally, a proper funding of the agricultural region of Nigeria can spur the quest of value-chain enhancement. By extension, it will create a multiplier reaction of job creation, increased output, provision of unprocessed components for Nigeria's ailing industry and more. Thus, the purpose of this paper is to examine the aspect of Deposit Money Bank (DMBs) on agricultural production in Nigeria.

This research work is divided into four parts. The first part is the introduction, the second part is the review of related literature, the third part is the methodology and fourth part is the estimation and result.

2. Review of Related Literature

Economic literature has in previous years provided diverse theoretical and empirical pathways for discussing the nexus between DMBs credit and agricultural output of countries. In this part, an exertion is made to survey them. We commence with theories.

2.1.1 The Financial Liberalization Theory(FLT)

The FLT theory originated from the work ofMckinnon and Shaw (1973). This theory, held's down that the state intervenes in the monetary markets to enhance savings, investment and growth. It does this by mobilizing interest rate regulation and credit appropriation to the useful sectors of an economy,Udoka, Mbat and Duke (2016). Mckinnon and Shaw (1973) also believe that "financial repression" needs to stop in developing countries and encourage financial flexibility. They further opine that, a country needs to develop its financial circle to boost its absolute growth. Financial oppression signifies a set of restraint that are so firm that the financial orb cannot be advanced (Orji &Ogbuabor, 2015).

For these economists as observed by Mckinnon and Shaw (1973), financial repression leads domestic agents to choose having unprofitable assets instead of depositing assets in the bank. For this logic, there are not abundant budget to be given in the economy, which constitute an obstruction for investment and hence retard economic expansion and development.

Oriji & Ogbuabor (2015) also reiterates that Mckinnon, financial liberalization lead to unified financial markets and the best approach is to let interest rates freely fluctuate. In this grip, interest rates would mirror the capital scarcity and the instruction charge about borrower quality. Besides, high interest estimate would stop low yield investments. The authorities should limit their role to ensure low inflation and to promote financial district expansion (Anthony, Jonathan, Onyinye & Athony 2015).

Stationed on the above predictions, the Financial Liberalization Theory have received several criticisms. Some scholars have disputed that financial repression cannot be the only cause of credit rationing. This was central to Weiss and Stiglitz (1981) thesis. According to Weiss and Stiglitz (1981), information asymmetry, market imperfections and monopolistic banks can get to equivalent result. The criticism of this notion attend to the development of advanced financial liberalization theories which suggest that before gradual liberalization can take place, it can be better to establish an efficient tax system, ensure a decrease in government allocation and an overall stable environment, with well-managed monetary control (Mancel, 2009).

2.1.2 Commercial Loan Theory(CLT)

The commercial loan theory also referred to as the Real Bills Doctrine states amongst others that a commercial bank shall advance only short term self-liquidating rewarding loans to trading firms. Self-liquidating loans signify those loans which indicates funding of the production and movement of properties through the consecutive stages of transportation, distribution, storage and production. When such goods are ultimately sold, the loans are studied to liquidate themselves automatically (Jhingan, 2009).

The CLT equally offered that the ideal assets of commercial banks will consist of short term business loans made to business firms for the administration of their working capital. Just as a bank finances the functioning capital of a firm, it expects funds for repayment to originate from the authority of working capital itself Udoka, Mbat and Duke (2016)

The CLT also posits that when commercial banks make only short-term liquidity productive loans, the central bank, in reversal will lend to the banks only on the bond of such short-term loans. This principle would ensure the

proper extent of liquidity for various bank and the proper money supply for the whole economy. The central bank is meant to escalate or decline bank reserve by rediscounting approved loans when business expand and the obligation boost trade, banks are capable to acquire additional reserve by re-discounting bills with the central bank when business fall, the stock of bank reservoir and the bulk of bank credit and money would also contract (seeUdoka, Mbat and Duke,2016)

Considering this theory as it discloses to the agricultural sector, commercial (now Deposit Money Banks) are conventional to grant short-term self-liquidating credit to Peasants for financing their working capital needs. These credits are familiar to be used basically for farming activities also the loan repayment should be made out the farm proceed (Ekine and Onukwuru, 2017).

2.1.3 Agriculture Based Economic Development Theory(ABED)

In addition to FLT and CLT, the ADEDwas propounded by Higgins in 1954. In his view, agricultural based strategy for economic expansion requires technical, institutional and financial-intensive transformation that will raise the capacity of small farmers. Higgins (1954) further explained that agricultural finance incentives play a dual performance in the course of economic development by expanding food supplies and employment in the economy. Lewis (1950) had re-modelled this theory by incorporating some structural changes into the model. The theory is now focused on the structure for which disadvantaged economies can transform their domestic economic structure from a huge attention on small scale agriculture to more modern agricultural practices through heavy financial support. The essence is to fast-track value in the agro part of the economy.

2.2 Empirical Review

One observation infared from various theoretical perspectives above is that there remain a myriad of opinated foundations for linking DMBs and agricultural yield in the economy. This section x-rays some empirical views. There are extant literatures concerning the part of DBMs credits in agricultural achievement of countries. Most of these research have demonstrated mixed results. For instance, Anthony, Gabriel, and Arikpo (2015) inspected the aftermath of deposit money banks credit on the growth

of the agricultural sector in Nigeria within the duration of 1988 to 2011. They exploited the OLS approach of multiple regression to evaluate the data. Proceeds from the test reports that deposit money banks loans and the Agricultural Credit Guarantee Scheme (ACGS) fund has a clear link with the productivity of the agricultural sector in Nigeria. It was nonetheless detected that agricultural credit guarantee scheme finances link was insignificant. The research further explains that deposit money bank lending estimate possesses an inverse and insignificant relationship with the productivity of the agricultural sector in Nigeria. Stationed on these discoveries, it supported that the loans and resources to the agricultural sector should be heightened while the lending rate should be decreased .

Iwedi, Igbanibo and Onugbu (2015) studied the impact of DMBs domestic credits on the economic expansion of Nigeria employing time series data for the span of 1980 to 2013. The study selected the augmented Dickey Fuller unit root test and OLS to evaluate the data. The study showed that Credit to the Private Sector (CPS) and Credit to the Government Sector (CGS) firmly and significantly correlate with GDP in the short run. The search admits the presence of poor long run rapport between bank domestic credit indicators and GDP in Nigeria. The study suggest that the administrators of the Nigerian economy should shape out policies that will strengthen the bi-directional stream of rouse between the banking sector where investible earnings are derived and the real sector of the economy where goods and services are formed.

Udoka, Mbat and Duke (2016) again did studied the outcome of commercial banks' credit on agricultural output in Nigeria. The research exploited the ordinary least square approach of regression system to evaluate the data. The work reveals that there was a clear and significant link between agricultural guarantee scheme fund and agricultural manufacturing in Nigeria; there was a positive and significant link between commercial banks credit to the agricultural sector and agricultural enlogation in Nigeria; there was a straight and significant accord between government expenditure on agriculture and agricultural production in Nigeria and an inverse relationship between interest rate and agricultural output also proved theoretical hypothesis. The study recommends amongst others that there was the need for the state to promote

guarantee loans to farmers as this would inspire the banks to lend more to farmers.

Ekine and Onukwuru (2017) investigated the reaction of Deposit Money Banks credit on agricultural sector achievement in Nigeria from 1986-2016. The survey employed explanatory statistic, unit root test, OLS, and Granger Causality Test and co-integration as the tools of analysis. The outcome explains that there is no co-integration (or long run) link between deposit money banks credit to agricultural sector and the attainment of agricultural sector in Nigeria at the time of study; deposit money banks credit to agricultural sector has a direct and significant shock on agricultural performance; interest standard had an inverse insignificant relationship with agricultural sector achievement. Also, the study acknowledges that government expenditure had a clear insignificant relationship on agricultural sector performance. In-line with the findings, the study suggested that the state should generate effort, together with seperate entities to inspire investment in agricultural sector. The lending rate on loans to the agricultural sector should be considered and hooked at a rate that would hearten farmers to earn loans from deposit money banks

Another novel study was undertaken by Okoro and Nwali (2017) on agricultural funding and challenges of Deposit Money Banks in Nigeria adopting secondary data. The descriptive statistics results showed that Deposit Money Banks financing of agricultural sector was the minimum as to other sectors of the economy between 1984 and 2009. It was also found that the banks being determined on making earns means do not have the sufficiency to fund agriculture in Nigeria due to fact interest rates of the central bank of Nigeria. Also portfolio instruction policy of CBN strained the capability of deposit money banks to escalate returns on their investment in agriculture. Similarly, deposit money banks were confronted by so many ups and down in their surge of funding agriculture. Such challenges identified include: Human ability, economic, financial resources, political and environmental challenges, all these actions reciprocate with one another to cripple deposit money banks from financing agriculture other than other sectors of the economy. The study therefore recommended a legal and regulatory policy reform to entrust institutional investors and other corporate investors to

contribute continual origin of long-term endowment for the agricultural sector.

Nwokoro (2017) study focused on the link among banks credit and agricultural performance in Nigeria within the scope of 1980 to 2014. From the empirical estimation made employing the OLS and error correction model techniques of analyses, data on banks' credit along with interest rate foreign exchange rate, government expenditure on agriculture and money supply on agricultural output in Nigeria were utilized. The research established that aside from interest rate that had an inverse but insignificant relationship, foreign exchange rate, bank's credit to agriculture, government spending on agriculture and money supply have a concise and significant relationship with agricultural contribution to Gross Domestic Product. The study therefore recommended that the state should execute feasible policies to increase its dimension in producing more loans and approach accessible to honest farmers from commercial banks with less complication and unacceptable red tapes.

From the related literature reviewed so far, it be deduced that countless researches have been perfected on the impact of deposit money banks credit on agricultural output of countries. This work varies in some ways from current studies. Theoretically, it adopts commercial loan approach for the model. On the ground that, the approach describes the geniueness of a nation's economic growth, which depends on agricultural sector performance. This is attained through Deposit Money Bank funding the agricultural sector. Again,in-terms of method of analysis, it adopts descriptive statistics, Co-integration, Unit root test, and Error Correction Model (ECM) method of analysis as its estimation techniques and extends the scope to cover 1980 to 2017. To the best of our research, no one out of the previous studies reviewed have filled this divergence in literature, thus, styles the footing for discussions.

3. Methodology.

3.1 Explanation of Variables in the Model

(a) Dependent Variable: The dependent variable in this article is output of agricultural sector. This is the sum volume of services and goods produced in the agricultural sector, usually measured in a year. It is the primary part of

GDP of an economy. Agricultural contribution to Gross Domestic Product (AGDP) would proxy the output of agricultural sector.

(b) Independent Variables

(i) Credit of Deposit Money Bank to AGDP: the AGDP in this paper indicates to the diversified financial assets apportioned to the agricultural sector. The **AGDP** is meant to assist a corresponding hike in the output of the sector. Thus, it is expected that a direct link exist between output of agriculture and credit to the sector by DMBs. Hence, mathematically, ∂AGDP/∂MBC >O.

ii. Interest Rate (INR): the INR represents the cost of borrowing investable funds from DMBs. A high interest rate will discourage the farmers from borrowing and this will affect their productivity and also the other way around. This channels that prime interest rate is inversely associated to the output of agricultural sector. Hence,∂AGDP/∂INR<0.

iii. Government Expenditure on Agriculture(GEA): This is the spending of the nation's government in financing agriculture. According to economic policy, it is directly associated to the output of the agricultural sector.

These data are secondary data extracted from Central Bank of Nigeria (CBN) statistical bulletin (2017).

3.2 Analytical Framework

This paper is anchored on the commercial loan model the CLT assumes that a link stays between Deposit Money Bank's credit and agricultural output in an economy. Thus, in-line with the empirical work of Udoka, Mbat and Duke (2016),the present model relationship betwwen the variables with further modification in specification of scope covering 1980 to 2017.Accordingly, tothe baseline model is stated in a multiplicative form as:

$$AGDP_t = f(DMBC_t^{\alpha 1}, GEA_t^{\alpha 2}, INR_t^{\alpha 3}, E_t) \quad (1)$$

Where: AGDP is Agricultural Output, proxied by agricultural contribution to gross domestic product in Nigeria; DMBC is Deposit money banks' credit to

agricultural sector in Nigeria; GEA is Government Expenditure on Agriculture in Nigeria;NR represents Interest rate and ε depicts the error term.

Equation (1) was converted into log to empower the model agreeable to OLS as follows:

$$LOG(AGDP)_t=\beta_0+\beta_1 LOG(DMBC)_t+\beta_2 LOG(GEA)_t+ \beta_3 LOG(INR)_t+U \quad (2)$$

Where all the variables are previously described as, β_0 to $\beta_3$arethe parameter estimates while U is error term and assumed to be white noise.

The theoretical assumption around the symbols of the coefficients of the parameters are: $B_1> 0$, $\beta_2>o$ and $\beta_3<o$

4. Results and Discussions

The empirical analysis was organized in three phases. First, pre-estimation that employed the descriptive statistics was done. Descriptive statistics was exploited to evaluate the trend of the variables. Unit root test was ran to ensure stationarity of the data using the Augmented Dickey Fuller (ADF) approach. Next, the test of co-integration was done. The basic idea behind co-integration is that if, in the long run if too many variables move closely together, notwithstanding the variables themselves are trended, the variation among them is constant. It is feasible to regard these variables as defining long-run equilibrium relationships, as the contrast among them is stationary (Hall & Henry 1989). A lack of co-integration suggests that such variables have no long-run link, in principle; they can wander arbitrarily far away from one another (Dickey, 1991). We employ the Maximum-likelihood test procedure established by Johansen and Juselius (1990) in testing. Error Correction Model (ECM) was borne out to reconcile long-run disequilibrium with short-run. Third phaseentails post- estimation normality test, stability test,heteroscedasticity and serial correlation test. These estimation were conducted to align with the Ordinary Least Squares (OLS) assumptions of being the Best Linear Unbiased Estimator (BLUE) under the classical econometrics.

4.1 Descriptive Statistics Test

Table 1 provides a review of the descriptive statistics of the time series property of data. The conclusion appears that agricultural output averaged about 4,898,334.0 and differs from 10,011.50 to 21,500,000 with a standard deviation of 6767626.0 in the duration under review. It also displays that deposit money banks' credit to agricultural sector (DMBs) averaged 220,179.9 and differs from 462.2000 to 201,235.0 with a standard deviation of 525,915.4. It further exposed that government expenditure to agricultural sector (GEA) equate 14,963.88 and ranked from 12.80000 to 65,399.00 with a standard deviation of 18,935.61; interest rate(INR) equates 17.3342 and varied from 7.500000 to 29.8000 with a standard deviation of 4.903847.

Table 1 equally presents the coefficients of skewness and Kurtosis. All the skewness coefficient are positive, connoting that the series has a long run right tail. The kurtosis figures of AGDP, DMBC and INR were leptokurtic, recomending that their distribution were peaked proportionate to normal distribution while that of GEA is mesokurtic. The summary statistics show that the mean for the variables illustrates significant variation based on magnitude, tendering that the estimation in stratum may propose some distort in the end. Based on this perception, it implies that the series are non-stationary. Notwithstanding, this implication is not remarkable after all it contains time series data. Time series data are prone to variations created by numerous distinct events which perhaps might be direct or indirect. In sum, the Jarque-Bera statistic values calculated suggest the elimination of the null hypothesis of normal distribution for AGDP, DMBC and GEA at 5 percent level of significance but do not reject for INR. The implications of these results are that there remains unit root in the series. Based on these examinations, it is therefore needed to test for unit in series.

Table 1: Summary of Descriptive Statistics Result.

	AGDP	DMBC	GEA	INR
Mean	4898334.	220179.9	14963.88	17.33421
Median	1092639.	32154.90	4613.750	17.45000
Maximum	21500000	2012325.	65399.00	29.80000
Minimum	10011.50	462.2000	12.80000	7.500000
Std. Dev.	6767626.	525915.4	18935.61	4.903847
Skewness	1.309965	2.918274	1.074444	0.092950
Kurtosis	3.369611	9.931731	2.984835	3.394720
Jarque-Bera	11.08436	130.0141	7.311748	0.301408
Probability	0.003918	0.000000	0.025839	0.860102
Sum	1.86E+08	8366836.	568627.5	658.7000
Sum Sq. Dev.	1.69E+15	1.02E+13	1.33E+10	889.7655
Observations	38	38	38	38

Source: *Authors' Computation (2018).*

4.2 Unit Root Test

The decisions of unit root test are contained in Table 2. A close look at Table 2 reveals AGDP, DMBC and GEA and INR- were stationary in their first differences. In the model, it is estimated that most of the variables are in AD(1). This observation is stationed on the basis that the ADF test at 5% critical value, it is detected that the test statistics are higher than the critical values at levels but the ADF test at 5% critical value became greater than the test statistics after taking their first difference. Thus, the series are seen to be stationary at their first difference.

Table 2: ADF Unit Root Test Results

Variables	Level	5% Critical Values	1st Difference	5% Critical Values	Order of Integration
LN(AGDP)	0.032591	-3.536601	-4.157546	-3.540328	I(1)
LN(DMBC)	-2.219840	-3.536601	-6.430197	-3.540328	I(1)
LN(GEA)	-2.170162	-3.536601	-6.171142	-3.544284	I(1)
LOG(INR)	-2.921626	-3.536601	-5.849586	-3.544284	I(1)

Source: *Authors' Computation(2018)*

4.3: Co-integration Test

Co-integration test was borne out to resolve the presence of long run relationship amongs our variables using the Johansen and Juselius (1990) method. The result is conferred in Table 3. Under Johansen method, the eigenvalue statistics is used to figure out whether there is co-integrating variables. Co-integration is said to happen if the figure of computed statistics are significant from zero.

Table 3: Co-integration Test Result

Sample (adjusted): 1982 2017
Included observations: 36 after adjustments
Trend assumption: Linear deterministic trend (restricted)
Series: AGDP DMBC GEA INR
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.802380	103.7709	63.87610	0.0000

At most 1 *	0.486437	45.40017	42.91525	0.0276
At most 2	0.335953	21.41042	25.87211	0.1627
At most 3	0.169171	6.671913	12.51798	0.3800

Trace test indicates 2 cointegratingeqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.802380	58.37071	32.11832	0.0000
At most 1	0.486437	23.98976	25.82321	0.0857
At most 2	0.335953	14.73850	19.38704	0.2082
At most 3	0.169171	6.671913	12.51798	0.3800

Max-eigenvalue test indicates 1 cointegratingeqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Source: *Authors' Computation (2018)*

Table 3 reveals that the likelihood ratio is greater than the 5% critical value and the Max-Eigen statistic value is established as (58.37071) higher than the critical value (32.11832). The likelihood of AGDP is higher than the critical value at 5% level of significance. Furthermore, the eigen value of AGDP is significantly higher than zero. Hence, the null hypothesis of no co-integration around the variables is rejected. The test showed the presence of a long run equilibrium relationship of two co-integrating equation at 5% level of significance

4.4: Error Correction Model (ECM) Test Result

The existence of long run co-integration equilibrium in Table 3 provides for short-run fluctuations. In other, to straighten out the observed fluctuations, an endeavour was made to apply the Error Correction Model (ECM). The ECM

follows the general- to- specific framework. It begins with estimating an over-parameterized error correction model from where a parsimonious error correction model is obtained. Table 4 documents the ECM result.

Table 4: Parsimonious ECM Result

Dependent Variable: DLOG(AGDP)
Method: Least Squares

Sample (adjusted): 1983 2017
Included observations: 35 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.166591	0.042625	3.908262	0.0006
DLOG(AGDP(-1))	0.519264	0.148124	3.505610	0.0016
DLOG(DMBC(-2))	-0.118560	0.075357	-1.573304	0.1273
DLOG(GEA(-1))	-0.087383	0.039654	-2.203627	0.0363
DLOG(GEA(-2))	-0.064365	0.034735	-1.853034	0.0748
DLOG(INR)	0.171630	0.106363	1.613620	0.1182
DLOG(INR(-2))	-0.208370	0.105117	-1.982273	0.0577
ECM(-1)	-0.252536	0.077822	-3.245036	0.0031

R-squared	0.504208	Mean dependent var	0.205030
Adjusted R-squared	0.375669	S.D. dependent var	0.163738
S.E. of regression	0.129377	Akaike info criterion	-1.054545
Sum squared resid	0.451935	Schwarz criterion	-0.699037
Log likelihood	26.45454	Hannan-Quinn criter.	-0.931824
F-statistic	3.922618	Durbin-Watson stat	1.617681
Prob(F-statistic)	0.004496		

Source: *Authors' Computation(2018)*

Table 4 appears that the coefficient of ECM is positively (accurately) signed and significant at 5% level of significance. This explains that the velocity of adjustment among the short-run and the long-run certainty of the co-

integrating equations is 0.25 percent annually. The adjusted (R2) of 0.375 indicates that about 38 percent of the total discrepancy in the dependent variable is generated by the regressors. Thus, the rest 62 per cent are due to factors exogenous to the model but covered by the error term.

Furthermore, the overall foretelling capability of the model is significant at 5% level as exhibited by the value of F-statistic (3.92) been higher than the probability F-statistic (0.004). This entails that the whole model is significant. Equally, the D.W test which calculates the existence of autocorrelation is 1.62 approximately. Adopting 3 explanatory variables , 37 observations and 5% level of significance, the tabulated value for lower limit is 1.31 which is lower than 1.62, hence, the model is a good estimate too. Again, at 1% level of significance, the minor and major limit value of 1.11 and 1.45 respectively were found lesser than 1.62 D.W statistics. This affirms that the regression is not false hence forms the footing of discussion in this paper.

Table 4 presents that the link amidst Deposit Money Banks' credit and agricultural output is negative with coefficient (- 0.11856). The negative sign implies that an increment in deposit money banks credit to agricultural sector would head to a cutback in the output of agriculture and vice versa. This finding does not comply with our apriori expectation. Again, the result is statistically insignificant at the 5% level of significance, as 0.05 is lower than the probability figure of 0.127. Thus, we accept the null hypothesis which states that there is no significant relationship amongst DMBs credit and agricultural output. The policy implication of this discovery is that farmers have not enjoyed credits from these formal financial institutions within Nigeria. This divergent view perhaps can be as an outcome of high interest rate debited by banks which discourages farmers from borrowing to finance their investment. Other reason could be the inability of deposit money banks to give allowance to farmers because of huge expenditure of administering,lack of collateral, information asymmetry, loan default, unstable macroeconomic environment and more. Theoretically, this finding deviates from earlier study by Udoka, Mbat, and Duke (2016). In view of Udoka, Mbat, and Duke (2016), DMBs credit and agricultural output in Nigeria.

Furthermore, Table 4 also indicates that the link amongst government expenditure on agriculture and agricultural output is negative too. This

explains that an escalation in government spending on agriculture depresses agricultural output and vice versa. This finding contradicts economic policy which is predicted on the basis that a boost in government expenditure would lead to an expansion in the Nigerian agricultural output. This finding also does not conform to apriori expectation to existing literatures such as Ekine and Onukwuru (2015) and Udoka (2016). These scholars have noted that a boost in government expenditure will edge the increment of agricultural output.

Table 4 equally illustrates that the link between interest (lending) rate of deposit money banks and agricultural output is negative with coefficient of (-0.208), which is appropriately signed. It conforms to our apriori assumption. The negative sign implies that a boost in interest (lending) rate would lead to a shrink in the Nigerian agricultural output and vice versa.

4.5 Post- Estimation Test

(a) Normality Test

A normality test is exploited in this paper to estimate the statistical process of wether a sample data or these group of data fits a standard normal distribution. To carry out this test, our focus is on the Jarque-Bera(JB) statistics test result. The result of the J-B estimate shows a huge value of probability. Specifically, the probability value for Jaque-Bera statistics is 0.57 which is fairly huge . Thus, the null hypothesis is accepted.

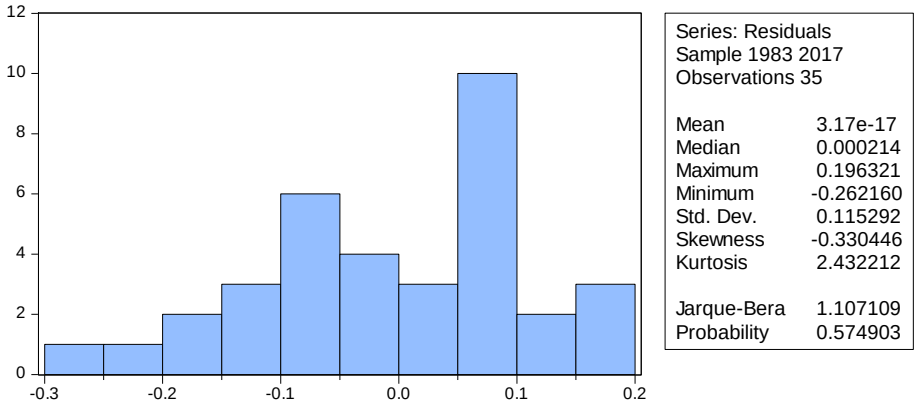


Figure 1: Normality Test Rest

(b) Stability Test

Stability test was borne out to analyse for the stability of the variables. This is indicated in Figure 2a and 2b.CUSUM (Cumulative Sum Control Chart) that is a sequential analytical technique use to determine transformations in parameter of the probability distribution.

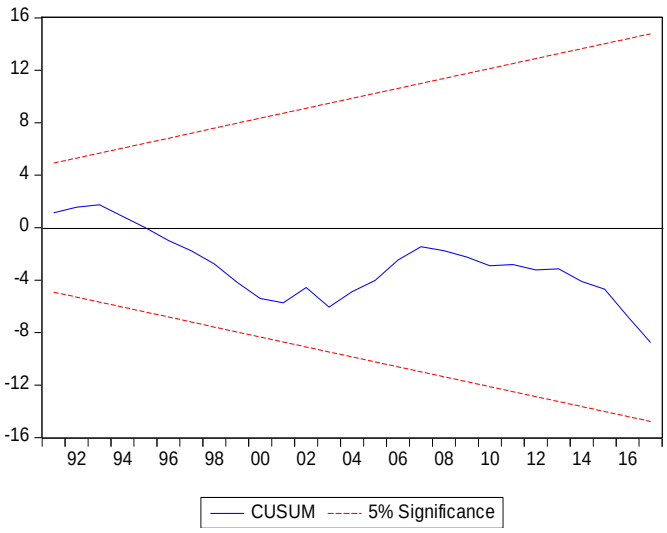


Figure 2a: CUSUM of Squares

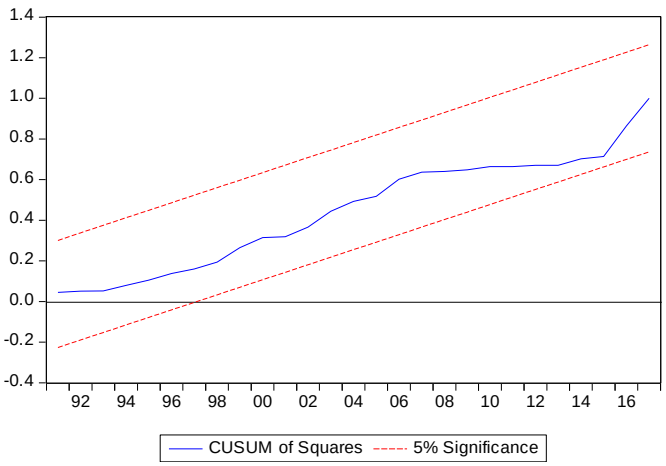


Figure 2b: Stability Test Result

In Figures 2a and 2b, the blue line represent both CUSUM and CUSUM Square individually while the red line is 5% significance level. Suffice it to

say that, assuming that the blue line is above or below the red line, it means that the variables are not stable but if it lies within them, it shows that the variables are stable. In each, case, the blue line falls between the red line as expected. Hence, the stability of the variables are verified. This in essence certifies that our model is rightly specified. We proceed to find out for serial correlation and heteroskedasticity.

(C) Serial Correlation test result

Serial correlation explains to the link amongst the successive values of the equivalent variable. It is undesirable in a model stationed on OLS estimation. The existence of serial correlation will violate the Best Linear Unbiased Estimator (BLUE) property of regression equation. Hence the obligation to test for serial correlation.

The serial correlation has a null hypothesis which is usually tested in contrast to the alternative of the existence of serial correlation. If the probability value of F-statistics is higher than 5% (0.05), then the null hypothesis should be accepted, but if it is lesser than 5% is rejected indicating the existence of serial correction.

Table 5:Serial Correlation Test Result

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.928695	Prob. F(2,25)	0.1664
Obs*R-squared	4.678477	Prob. Chi-Square(2)	0.0964

Source*: Authors' Computation(2018)*

The estimate of the serial analysis is given in Table 5. It indicates that the probability value of F-statistic is clearly higher than 0.05. Thus, showing that serial correlation is not in the model.

(D) Heteroskedasticity Test

The intent here is to establish that the model is homoscedastic. Homoscedasticity simply entails that the model is in conformity with one of basic belief of error term which explains that the variance of error term is constant. Heteroscedasticity test is mostly tested in opposite direction to provide that the model is homoscedastic. Suffice it to assert that one of the desirable properties of classical least square estimation method is the presence of constant variance

Thus, the null hypothesis postulates that the model is heteroscedastic is estimated across the alternative. Here, the probability value of R-squared is checked with the 5% significance level. If the probability value of R-Squared is higher than 0.05, we dismiss the null and take the alternative hypothesis.

Table 6:Heteroscadascity Test Result

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.848835	Prob. F(7,27)	0.1184
Obs*R-squared	11.34060	Prob. Chi-Square(7)	0.1244
Scaled explained SS	4.832865	Prob. Chi-Square(7)	0.6804

Source*: Authors' Computation(2018)*

The probability figure of 0.12 as displayed in Table 6 is higher than 0.05. This is a clear evidence that the null hypothesis is rejected and the alternative accepted. Thus, we conclude that this model is not at all suffering from heteroscedasticity.

5. Concluding Remarks

Agricultural credit is considered to be a precise essential enabler in farming exercise as suitable finance are made availaible to farmers could make agricultural value-chain achievable and passes to boost in output. Due to this assumption, this paper was initiated essentially to determine the performance

of Deposit Money Banks' credit to agriculture on the output of agricultural sector in Nigeria. Based on the empirical investigation of the results, the paper concludes that there is an insignificant inverse link amongst deposit money banks' credit to agricultural sector and Nigerian agricultural output. The policy indication of this discovery is that farmers have not enjoyed credits from these formal financial institutions in Nigeria. This divergent view perhaps can be as the outcome of huge interest rate charged by banks which discourages farmers from borrowing to fund their investment. Other reason could be the inability of Deposit Money Banks to give credits to farmers because of huge cost of administering, lack of collateral, information asymmetry, loan default, unstable macroeconomic environment and more. The result however showed that government funding on agriculture has a significant negative influence on agricultural output in Nigeria. Finally, the result revealed that a negative and insignificant relationship exist amongst interest rate and Nigerian agricultural output. It is then suggested that a state of emergency be declared in the sector of agriculture. This can be concluded through increased government's budgetary share to the sector of agriculture in-line with the provisions of Food and Agricultural Organisation (FAO). The state should furthermore set up a monitoring team to establish that the allocated fund is judiciously utilized.

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KIDNAPPING IN THE SOUTH-SOUTH REGION OF NIGERIA: CAUSES, ECONOMIC IMPLICATIONS AND THE WAY FORWARD

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ABSTRACT

Kidnapping is one of the internal security challenges in South-South region ofNigeriaand the country at large. Due to theprevalence of the act of kidnapping in the region, numerous numbers of people have lost their lives on daily basis. Despite the effort of government and the security agentsto curb the menace, kidnapping still persists. From all indications, the government as well as the security agentsseems to be incapable of effectively securing the lives and properties of the citizenry from kidnapers. Therefore this paper examined the causes, economic implications of kidnapping in the South-South region of Nigeria. The paper used library science method and date were collected from secondary sources. The paper found that amongstthe causes of kidnapping arepoverty, unemployment, corruption, poor governance,environmental degradation and the use of psychoactive substances. Some of the economic implication of kidnapping include decline in investments and increase in the defense budget. The paper therefore suggested creation of employment and poverty alleviation programmes such asmicro-lending program. Also, there is the need for accountable and quality leaders that will be sensitive to citizenry plight.

Keyword: Kidnapping, Corruption, Poverty, Unemployment, South-South, Economic-implication

1. Introduction

After the Cold War period, most countries of the world are confronted with series of internal security challenges that threatened the national security. These internal security challenges take the form of terrorism, insurgency and kidnapping, amongst other. Correspondingly, Nigeria as a nation is getting more and more insecure, more people are getting into various forms of crimes and getting more ruthless and sophisticated. It is on this note that Robinson, Obayori and Ahmodu (2014) opined that some of the new forms of violent crimes in Nigeria that have been the other of the day is kidnapping for ransom and ritual killings. Equally, Ezeah and Osayi (2014) averred that one of the

hottest insecurity in Nigeria is kidnapping, a terrorist sect whose overt and covert activities has threatened the economy and foundation of the country.

Conceptually, "kidnapping" is the forceful seizure, taking away and unlawful detention of a person against his/her will. It is a common law offence and the key part is that, it is an unwanted act on the part of the victim. It is a restriction of someone else's liberty which violates the provision of freedom of movement as enshrined in the constitution of the Federal Republic of Nigeria (Asuquo, 2009). Similarly, Thomas and Nta (2009) defined kidnapping as robbery of the highest rank that entails organized and systematic robbery which is not as deadly as armed-robbery, but more profitable than the former. Uzorma and Nwanego (2014) also, averred that kidnapping is one of the terrorizing crimes in Nigeria which is mostly common in the South-South region. Thus, it occurs when a person is abducted and taken from one place to another against their will, or a situation in which a person is confined to a controlled space without the confinement being from a legal authority. Theoretically, the Queer Ladder Theory (QLT) highlights that organized crime in the form of kidnapping is an instrumental behavior; it is a means to an end. It is an instrument of social climbing and/or socio-economic advancement. It is also a means to accumulate wealth and build power.

Meanwhile, Kidnapping in the South-South region which comprises of the states of Akwa Ibom, Bayelsa, Cross Rivers, Delta, Edo and Rivers started as a way to draw home agitations seeking for equity, justice and fairness in the region (Demola, 2011). The rise in kidnapping in the South-South region can be traced to fight for bigger shares of the returns from natural resources found in the region. This was further aggravated by the tendency for the ruling class to be involved in endless accumulation of natural resource rents accruing from the region. These were through deliberate act of marginalization and deprivation.

The upsurge in kidnapping in the region has threatened both the regional and national security as well as the economy. This is because the phenomenon of kidnapping has scared both the local and foreign investors away which has affected the socio-economic development of the region and the Nigeria at large. According to Oyemwinmina and Osazuwa (2016), foreign investors as

well as citizens are scared to operate businesses in Nigeria particularly in the South-South region because no investment thrives in an atmosphere of insecurity and this contributes to increase in the rate of unemployment, poverty and inequality which leads to economic meltdown.

Empirical evidence shows that out of 56% of all kidnapping reported in Nigeria in 2016, over 40% of all the kidnapping occurs within the Niger Delta region which is South-South dominance (Obayori, Osai, Ahmodu & Maeba, 2018). This scenario becomes worrisome to the government and private individual. Given the above problem, Government has made frantic effort in curtailing the upsurge of the incidence of kidnapping in the Niger Delta region and Nigeria at large. Some of the effort several efforts made by the federal government of Nigeria in curtailing the series of problem of the South-South and Niger Delta region by setting up agencies and programmes like the NDDC, Ministry of Niger Delta, Amnesty programme, introduction of various operations like Operation DELTA SAFE amongst others.

Despite these agencies and programmes, the problem persists because of insincerity, corruption, lack of technical equipment and weak government policy. Thus, all these efforts have not yielded the required result. It is against this backdrop, that this study seeks to provide answers to the following questions; what are the causes of kidnapping in Niger Delta? What are the economic implication of kidnapping? This paper shall employ the political-economy analytic technique and relevant materials from library, newspapers, periodical and academic journals to describe the causes, severity and other issues related to kidnapping in the Niger Delta.

2. Literature Review

2.1 Conceptual Clarification

The term ‘kidnapping’, according to Asuquo (2009) is difficult to define with precision, because it varies from state to state and jurisdiction to jurisdiction. Walsh and Adrain (1983) also affirm that kidnapping varies from country to country, therefore the term is uncertain and devoid of any straight jacket definition. Thus Walsh and Adrain (1983) defined kidnapping as unlawful

seizure and detention of a person(s) by force against their will. It is also an act of seizing a person and taking him/her to another country for involuntary servitude or the imprisonment of males into military or naval service by force or fraud.

Adibe (2008) defined kidnapping as the taking away of a person against the person's will usually for ransom or in furtherance of another crime. For Inyang and Ubong(2013) kidnapping is the forcible seizure, taking away and unlawful detention of a person against his/her will. It is an act of seizing, taking away and keeping a person in custody either by force or fraud (Abraham, 2010). This includes snatching and seizing of a person in order to collect a ransom in return.

In the view of Thomas and Nta (2009) kidnapping is an organized and systematic robbery which is not as deadly as armed robbery, but more profitable than the former. The profitability has encouraged those that indulged in it to carry on with the act although there is law prohibiting it (Inyang&Ubong, 2013). From the perspective of criminal law, Arewa (2013), citing the case of state and Harrison which defines kidnapping as "false imprisonment aggravated by conveying the imprisoned person to some other place. It is defined as "the unlawful taking and carrying away of human being against his will by force or fraud or threats or intimidation, or to seize and detain him for the purpose of so carrying him away".

It is therefore the taking away (exportation) of person against the person's will, usually to hold the person in false imprisonment (confinement without legal authority) for ransom or furtherance of another crime (Arewa, 2013). Thus, kidnapping is to abduct, capture, carry off, remove and steal away a person.

There are basically two types of kidnapping. These are; economic and political kidnapping. Economic kidnapping or the kidnapping business is where a finance demand is made, which could be either hard cash, or some other financial resources (Thom-Otuya, 2010). Kidnapping is a business venture that is regulated by the laws of demand and supply and is a type of social action that involves the calculation of the most efficient means to desired end. As

economic venture, kidnapping enterprise and kidnappers are businessmen, they just happen to be on the illegal side of it. If you deprive them of the demand then there is not going to be any supply. On the other hand, political Kidnapping, kidnapping is seen as an instrument for political vendetta and settling of political scores. The operation is organized and targeted mainly on key serving politicians or contractors working directly for government. Once the victim is kidnapped, a high level of negotiation is expected which will ultimately lead to a heavy ransom. Such ransom is used to further political goals, self-settling of aggrieved groups or a way of financially crippling an aspiring politician. Turner (2008) describes this as "money and politics" kidnapping, where there are political motive for kidnapping but where ransoms are also demanded. One glaring instance of political kidnapping was that of Chris Ngige, the current minister of labour and productivity, who was kidnapped in July 10, 2003 by his fellow political party members who were in opposition with him.

2.2 Empirical Review

Empirically, Nseabasi (2010) carried out an exploratory study on Kidnapping in Nigeria's Niger Delta. The study uses available news reports as well as personal and neighbourhood witnesses, in addition to the review of literature. In the result, various forms of kidnappings were identified in relation to economic and political motivations as well as kidnapping as instrument of liberation fight. Also, Ngwama (2014) used the discussion method to examine the implication of Kidnapping in Nigeria for the Labour Market. He opined that the significant impact of kidnapping has heightened the fear of foreigners, especially international investors; thereby threatening the foundation of economic development. The overall implication has worsened the labour market situation resulting to thousands of unemployment and displacement of the workforce from the affected areas.

Inyang and Obong (2013) investigated the problem of kidnapping and its consequences in Nigeria; the case of Uyo dwellers. Chi-square analytical tool was used to analyze elicited data at 0.05 level of significance. The result from the test of hypothesis one shows that there is a significant relationship between the recurring rates of kidnapping and the people's culture. Findings from the

study shows that, the prevalence of kidnapping in Nigeria is as a result of laxity in the law implementation process to prosecute offenders.

Benjamin, Bonaventure and Okpan (2018) examined the phenomenon of kidnapping and hostage taking in Southern Nigeria and its socio-economic implications. The study utilized secondary data and was anchored on functionalist theory. Amongst other factors the study argues that the issue of kidnapping and hostage taking has been on the increase due to leadership failure, unemployment, poverty and corruption among security agencies.

3. Causes of Kidnapping

The first category of causes of kidnapping in the Niger Delta are, poverty, indolence, the structure of the society and economy, the judicial system, loss of values and the unprofessional role of the security agencies. Other causes are corruption, lack of intelligence information, low motivation of security agencies, as well as the general failure of mist state institution in the security sub-sector.

Evidence of abandonment of the Niger remains in the public domain. After decades of neglect, some youths resort to criminality and kidnapping (Abraham, 2008). The deployment of violence by the federal government to counter the Niger Delta struggle opened vista for the stock-piling of arms and ammunition in the Niger Delta. Some of these arms fall in the hands of the militants, which embolden them to kidnap the expatriates and later Nigerians.

Police records showed that in 2007 and 2008 alone, over 100 kidnapping took place. For instance, the mother of Bayelsa State House of Assembly in Akassa was kidnapped, 42 hostages, mainly of foreigners were recorded in this period; while 6 policemen were taken hostage in Sagbama on the 23rd of February, 2007 (Famous, 2007).

Over the years, several cases of kidnapping have taken place in the Niger Delta. In 2019, the mother of Siasia, Nigeria former National Team Coach was abducted, while several kidnappings, including killing along the East-West road, South-South Nigeria are common occurrences.

Poverty and Unemployment: Poverty is a state of being poor. The incidence of poverty is one of the reason that occasioned kidnapping and robbery. No wonder each time a person is kidnapped in south-south region and Nigeria as a whole, the group will always demand for a ransom from the victim relatives. Similarly, unemployment situation whereby people who are willing and capable of working could not find any work to do. Unemployment is one of the socio-security challenges that have been identified.

Corruption and Poor Governance: It is obvious that one of the greatest challenges facing the Nigeria is lack of accountable leaders. Nigeria lack quality and accountable leaders to pilot the affair of the country by transforming the economic wealth and equitable distribution of the resources amongst the governed. Thus, leadership should be seen as opportunity to serve the nation and not opportunity to acquire wealth at the expense of the poor masses. Also, Arewa (2013) pointed out that economic failure is attributed to erosion of the state's institutional and administrative capacities, corruption pandemic, poor state of the rule of law and military dictatorship, inability to implement its policies and decisions due to corruption.

Environmental Degradation: Exploitation of crude oil and natural gas in the south-south region has caused immeasurable ecological devastation of the land. These take the form air pollution, soil quality alteration and destruction of aquatic ecosystem. The environmental degradation being carried out by the oil companies in the Niger delta region as a result of their non-compliance with internationally recognized environmental standards are damages that their consequences cannot be limited by time. This is the motivating factor for youths in the region to engage in kidnapping and other related criminal acts.

The Use of Psychoactive Substance: It has been observed that the use of psychoactive substances is very common among adolescents. The percentage of middle schools students who reported using marijuana, cocaine, cigarettes, tobacco, alcohol, marijuana and aerosols increased throughout the early 1990's. Thus, the upsurge of kidnapping is linked to high consumption of these psychoactive substances or hard drugs (Okoli, 2009). The use of hard drugs no doubt leads to violent crimes such as kidnapping.

4. Economic Implication of Kidnapping

Decline in Investments: Niger Delta is considered to be economic powerhouse of Nigeria: Thus, Foreign Direct Investment (FDI) plays a crucial role in economy. But as a result of kidnapping activities, FDI has declined. This is because no foreign investors want to invest capital in an environment of fear, anarchy, and insecurity.

Increase in the Defense Budget; the escalation of the insurgency in early 2010 caught the government flat-footed. Sustained attacks, however, ushered in more sober responses. Since 2012, it has tried to address the challenge on multiple tracks but especially by increasing the defense budget from 100 billion naira ($625 million) in 2010 to 927 billion naira ($6 billion) in 2011 and 1 trillion ($6.25 billion) naira in 2012, 2013 and 2014. Currently, the security budget double what we had in 2014. Much of these increases were to combat kidnapping (Obayori, Osai, Ahmodu & Maeba, 2018).

5. The Way Forward

Efforts should be made at all levels of government to tackle the problem of in the Niger Delta region by providing basic amenities such as roads, drinkable water, electricity, food, housing etc. It is important that the socio-economic needs of the Niger Delta be satisfied to stop the rate of hostage taking in the region (Famous, 2008).

It will also be useful to develop manpower training in the Niger Delta. This will help bridge the technological gap between Nigerians and the developed parts of the world. Technology creates job that take the youths out of the street.

The macro and socioeconomic solution to the menace of insurgency in Nigeria is creation of employment and poverty alleviation programmes such as SME, micro-lending program. If youth unemployment is solved and the poverty level is alleviated by the Nigerian government at various levels, there will be reduction in the level of insurgency if not completely wipeout. Job creation is a major solution to unemployment. According to Obayori (2016) Nigeria's unemployment rate between 2001 and 2016 stands at 23.9% of our total 50

Million youths. This is a great problem. Thus, government has to take many laudable steps to create jobs in order to reduce the rate of poverty.

It is obvious that one of the greatest challenges facing the African countries particularly, Nigeria is lack of accountable leaders. Nigeria lack quality and accountable leaders to pilot the affair of the country by transforming the economic wealth and equitable distribution of the resources amongst the governed. Thus, there should be improved governance and service delivery by exemplary and transparent leadership.

The prevention of environmental degradation will help to check the challenge of environmental degradation in the Niger Delta. In preventing environmental degradation, the FGN could strengthen relevant agencies like the National Oil Spill Detection and Response Agency (NOSDA). This could be achieved by providing it with adequate staff, funding, modern equipment's and facilities and guaranteeing its independence without any external interference. The FGN could vest more power to sanction the defaulting oil companies and compensate the victims to prevent and assess the impacts of oil spillage. Also, there should be full implementation of the recommendations of the African Commission on Human and Peoples' Rights (ACHPRs)

6. Conclusion

The activity of Kidnapping is one of numerous insightful threats to Nigeria's stability. It has grown quickly to be a major security challenge because it associated with bad governance, poverty, unemployment, corruption and official impunity. To address these challenges, the federal, state and local governments must develop and implement comprehensive plans to tackle not only physical insecurity but also the grievances that fuel the insurgency. The need for radical reform of governance and the country's political culture is required. Based on the observations, the paper suggested; Job creation and poverty Alleviation Programmes in order to reduce the menace of kidnapping. Also, Governments must develop and implement comprehensive plans to tackle physical security and the grievances that fuel kidnapping.

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