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IMPACT OF HEALTH INDICATORS ON ECONOMIC GROWTH IN AFRICA: A COUNTRY-SPECIFIC ANALYSIS BASED ON POOLED MEAN GROUP ESTIMATION APPROACH

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Abstract

The study empirically examined the impact of health indicators on economic growth in the 33 selected African countries over the period of 1990 to 2017, taking country-specific impact into account. The study employed both first and second-generation panel unit root tests as well as pooled mean group (PMG) estimation techniques within the framework of the panel autoregressive distributed lag (Panel ARDL) model. On the whole, the results confirmed the existence of significant differences in the impact of health indicators proxied by life expectancy, mortality rate, and fertility rate on the economic growth of the studied countries in terms of signs and magnitude as well as the significance or otherwise of the coefficients. To bridge the identified differences, the study recommended that governments of the selected countries should create preconditions for boosting the levels of health indices for increasing economic growth and development. This can be in form of increasing access to quality education, health services, and other social amenities by adopting the "Free-Service-For-All" approach particularly for women and children who are more vulnerable. Equally, there should be a rigorous commitment on the part of governments to create more job opportunities otherwise improvements in health status accompanied by high unemployment will render the former to be ineffective in determining economic growth.

KEY-WORDS: Health Indicators, Economic Growth, Impact Analysis, Panel ARDL, PMG, African Countries.
JEL Codes: Q18, H31, D12, C31.

INTRODUCTION

As a component of human capital, health has been widely acknowledged to play a key role in the development process of any economy. Mushkin (1962) emphasized the importance of health, by pointing out that it constitutes an important form of investment in addition to other forms of human capital formation like education. Good health increases labor force participation and productivity by reducing incapacity, weakness, and the number of days lost to sick leave. In view of these assertions, new theoretical models of growth such as Mankiw et al. (1992), Barro (1996), and Barro and Sala-i-Martin (2003), etc. were developed in which health was incorporated as a determinant of economic growth.

Obviously, whether health can contribute to economic growth or not strongly depends on the prevailing health status of a given population measured by health indices (or indicators) such as life expectancy, mortality rates, fertility rates, the prevalence of diseases, nutritional intake, access to healthcare services, etc. In view of this,

various empirical studies have been conducted both on a single and cross-country basis to examine the impact of health indicators on economic growth (e.g. Hartmann, 2010; Peykarjou, Gollu, Gashti, and Shahrivar, 2011; Ecevit, 2013; and Ada and Acaroğlu, 2014; etc.). However, a research vacuum still exists particularly in Africa where mixed results were reported. Also, the dynamic links between health and economic growth in Africa have not been adequately established as most of the studies were centrally focused on either the effects of diseases such as HIV/AIDS (e.g. Huang, et al., 2010) on economic growth, or using health inputs usually proxied by health expenditure (e.g. Modibbo and Saidu, 2020). Little has been documented on the link between the indicators of health status and economic growth (Gisore, et al., 2014).

Above all, a large number of the previous works on the health-growth relationship in Africa failed to account for the differences in the impact of health indicators on economic growth among African countries. Although Odhiambo (2014) accounted for the regional differences in the impact of health expenditure on child mortality in Africa, he neither examine the impact of health indices (child mortality) on economic growth nor the regional differences in its impact- among African sub-regions not to talk of country-specific impacts. This is the novelty of this research.

Against the above background, the main objective of this study is to examine and analyse the differences in the impact of health indicators on the economic growth of selected African countries. However, the rest of the paper is structured as follows: section two reviews the literature and section three presents the methodology. While section four analyses the data, the last section concludes the study with policy implications of the results and offers recommendations.

LITERATURE REVIEW

Various studies have been conducted to empirically examine the relationships between health variables and economic growth. For example, Hartmann (2010) studied the link between total fertility rate and economic growth in developing countries. The study covered an average period of 1975 to 2008 taking at 5-year intervals and the Pooled OLS, as well as random and fixed effects estimation techniques, were applied. The outcome of the study showed that total fertility rates negatively influence the rate of economic growth. In another study by Peykarjou, Gollu, Gashti, and Shahrivar (2011), the relationship between health and economic growth was examined using panel data over the period of 2001 to 2009 for 15 OIC member states. Within the framework of the Semi Log Regression Model based on the fixed effect approach, the result showed that a rise in life expectancy raises economic growth in the studied countries, while an increase in fertility rate decreases economic growth. Similarly, within the context of panel cointegration and causality tests, Ecevit (2013) employed Pooled OLS, Dynamic OLS, and Fully Modified OLS techniques to examine the long-run impact of life expectancy on economic growth using panel data for the period of 1970-2010 for 21 OECD countries. The results also showed that life expectancy has a positive and significant long-run effect on real per capita GDP in OECD countries over the period of the study.

Furthermore, Tolulope and Taiwo (2014) examined the contribution of health inputs and outcomes to the growth process in Sub-Saharan Africa using panel data of 30 countries from the sub-region spanning from 1995 to 2011. Employing Dynamic Generalized Method of Moment (GMM) modeling framework, the results of the study showed that health outcomes proxied by mortality rate have statistically significant negative effects on economic growth. Again, Ada and Acaroğlu, (2014) analyzed the relationship between economic growth and human capital for the period between 1990 and 2011 for 15 MENA (Middle East and North Africa) countries. Using fixed effect, random effect, and Generalized Least Square (GLS), the results showed that life expectancy and fertility rate have a statistically significant effect on GDP per capita while public health expenditure has no significant effect on GDP over the study period.

Contrary to the findings of the above studies, Modibbo, Muktar, and Inuwa (2015) examined the long-run relationship between health outcomes and economic growth in Nigeria from 1961 to 2014. Using the Augmented Dickey-Fuller (ADF) unit root test and Johansen Multivariate Cointegration approach as well as

Vector Error Correction Model (VECM) and VEC Granger causality test, the results obtained revealed the existence of a long-run relationship between health outcomes and economic growth in Nigeria. Specifically, life expectancy and crude death rate as measures of health were found to have a long-run negative and statistically significant impact on the economic growth over the study period. This is further buttressed by the results of the Granger causality test which indicated the existence of unidirectional causality running from life expectancy and crude death rate to economic growth.

Recently, Modibbo, Jalingo, and Jalingo (2019) have empirically examined the relationship between health indices proxied by life expectancy and infant mortality rates, and economic growth in West African countries over the period of 1970 to 2016. However, the results obtained using panel unit root and panel cointegration techniques developed by Pedroni revealed that there is evidence of long-run relationship among life expectancy, infant mortality rates, and economic growth and that increase in life expectancy and decrease in mortality rate enhance economic growth in the region. Accordingly, the results of Granger causality tests revealed the existence of unidirectional causality running from both life expectancy and infant mortality rates to economic growth.

Again, Modibbo, Mansur, and Inuwa (2020) have empirically examined the long-run relationship among health indices proxied by life expectancy, mortality rates and fertility rates, and economic growth in African countries over the period of 1990 to 2017. The study employed both first and second-generation panel unit root as well as panel ARDL cointegration techniques to examine these relationships. On the whole, the overall results revealed the existence of a long-run equilibrium relationship between economic growth and health indices as indicated by the coefficient of the Error Correction Term (ECT) which was negative and statistically significant. In addition, life expectancy and mortality rate were reported to have a significant impact on economic growth in Africa both in the long-run and short-run whereas fertility rate has a significant impact only in the long-run. Thus, the study concluded that life expectancy, mortality rate, and fertility rate are among the factors influencing economic growth in Africa.

In view of the above literature, it is incontestable that health indices play a significant role in the growth process of any economy. However, most of these studies were on a regional or continental basis, saying nothing on the country-specific impact of health variables on economic growth. It is the novelty of this study, therefore, to empirically examine and analyse the differences in the impact of health indicators on economic growth across selected African countries.

METHODOLOGY

Sources of Data

The main objective of this study is to examine and analyse the variations in the impact of health indices on economic growth among African countries. The data of the study were sourced from the World Bank's publication of World Development Indicators (2017) and the International Country Risk Guide (2017) spanning from 1990 to 2017. Based on data availability, the study selected Thirty Three (33) countries to form the sample size of the study. These are: Angola, Cameroon, Congo, Democratic Republic of Congo, Gabon, Ethiopia, Kenya, Madagascar, Malawi, Mozambique, Uganda, Zambia, Zimbabwe, Algeria, Egypt, Morocco, Sudan, Tunisia, Botswana, Namibia, South Africa, Burkina Faso, Ivory Coast, Gambia, Ghana, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, and Togo.

Pre-estimation Test of Unit Root

To examine whether or not, the series is stationary or integrated of the same order, panel unit root test was conducted using both First Generation Unit Root Test procedure developed by Im, Pesaran, and Shin (2003); and Second Generation Test proposed by Pesaran (2007) known as Pesaran's Cross-section Augmented Dickey-Fuller (CADF) test.

The general form of panel unit root test regression is written as follows:

$$\Delta y_{it} = \rho y_{i,t-1} + \sum_{L=1}^{p_i} \theta_{iL} \Delta y_{it-L} + \alpha_{mi} d_{mt} + \varepsilon_{it} \dots\dots\dots 1$$

with d_{mt} indicating the vector of deterministic variables and α_{mi} the corresponding vector of coefficients for model $m = 1, 2, 3$. Unlike Levin, Lin, and Chu (2002) test in which ρ in equation (1) above must be homogeneous across panel members, IPS allows for a heterogeneous coefficient of y_{it-1} and proposed an alternative testing procedure based on averaging individual unit root test statistics. Thus, given equation (1), the null hypothesis is that each series in the panel contains a unit root, that is, $H_0: \rho_i = 0$ for all i and the alternative hypothesis allows for some (but not all) of the individual series to have unit roots, that is, $H_1 = \rho_i$ for $i = 1, 2, \dots, N_1$ and $\rho_i = 0$ for $i = N_1 + 1, N_1 + 2, \dots, N$.

The first generation unit root test assumed that the individual time series in the panel are cross-sectionally independently distributed. However, this assumption was recognized by Pesaran (2007) as very restrictive, particularly in the context of cross-country regressions. By this, it means cross-sectional dependency among time series in a given panel data set is most likely to emerge. To deal with this problem, Pesaran (2007) proposed Cross-section Augmented Dickey-Fuller (CADF) test. In this case, the standard panel unit root tests are based on the simple averages of the individual cross-sectionally augmented ADF statistics (CADF).

Model Estimation

Following the unit root test of the variables, the next task is to estimate the model that explains the impact of health indicators on economic growth taking country-specific impact into account. To achieve this, this study employed a more robust model based on Panel Autoregressive Distributed Lag (Panel ARDL) developed by Pesaran and Shin (1999) and extended by Pesaran, Shin, and Smith (2001). This technique allows for cross-section interdependence with different individual effects. Furthermore, unlike other cointegration techniques such as Pedroni (1999; 2004) which are sensitive to the size of the sample, the panel ARDL approach is suitable even when the sample size is small and it can be applied regardless of whether the underlying regressors are integrated of order one [I(1)], order zero [I(0)], or a mixture of both (Modibbo, Mansur and Inuwa, 2020; Mustafa and Selassie, 2016).

Therefore, in line with the above advantages, a panel ARDL model is developed and presented as follows:

$$\begin{aligned} \Delta LRGDP_{it} = & \alpha_{it} + \delta_{it} + \sum_{k=1}^q \theta_{1ik} \Delta LRGDP_{it-k} + \sum_{k=1}^q \theta_{2ik} \Delta LE_{it-k} + \sum_{k=1}^q \theta_{3ik} \Delta MR_{it-k} \\ & + \sum_{k=1}^q \theta_{4ik} \Delta FR_{it-k} + \sum_{k=1}^q \theta_{5ik} \Delta Z'_{it} \Psi_{it-k} + \gamma_{1i} LRGDP_{it-1} + \gamma_{2i} LE_{it-1} \\ & + \gamma_{3i} MR_{it-1} + \gamma_{4i} FR_{it-1} + \gamma_{5i} Z'_{it} \Psi_{it-1} + \varepsilon_{it} \dots\dots\dots 2 \end{aligned}$$

Where Δ is the first difference, $i = 1, 2, 3, \dots, N$ representing number of cross-sectional units (in this case, $N = 33$); $t = 1, 2, 3, \dots, T$ is the time periods (in this case, $T = 28$). Also, the parameters θ_{ik} are the short-run parameters and γ_i represent the long-run multipliers; δ_{it} is the cross-section effects; and ε_{it} denote the estimated residuals which represent deviations from the long-run relationship. The parameters α_{it} and δ_i allow for the possibility of country-specific fixed effects and deterministic trends respectively. LRGDP is a proxy for economic growth while LE, MR, and FR represent life expectancy, mortality rate, and fertility rate respectively. In addition, Z' represents a vector of control variables which are quality of government and socioeconomic status. The choice of these control variables is based on their role in enhancing quality of life and per capita output. For instance, both the two variables depict not only country-specific characteristics but also determine the conduciveness of the environment in which we live and standard of living which are critical to achieving economic growth (Zalle, 2018 and Odhiambo, 2014). The null and alternative hypotheses are:

$$H_0 : \gamma_1 = \gamma_2 = \gamma_3 = \gamma_4 = \gamma_5 = 0$$

$$H_1 : \gamma_1 \neq \gamma_2 \neq \gamma_3 \neq \gamma_4 \neq \gamma_5 \neq 0$$

In terms of measurement, the dependent variable of this study is economic growth, proxied by Real Gross Domestic Product (RGDP) and measured in US Dollars at constant price taking 2015 as the base year. For independent variables, life expectancy is measured as the average number of years a new-born infant would live if prevailing patterns of mortality of the total population at the time of his/her birth were to stay the same throughout his/her life. Also, the total mortality rate is measured as the number of deaths occurring during a given year per 100,000 populations estimated at midyear. Again, the fertility rate is measured as the average number of children a woman would bear during her lifetime, assuming her childbearing conforms to her age-specific fertility rate every year (i.e. 15 to 44 years). For control variables, quality of government is measured as the mean value of three indicator variables: “Corruption”, “Law and Order” and “Bureaucracy Quality”, scaled between 0–1. Higher values indicate higher quality of government, and vice versa (ICRG, 2017). On the other hand, the socio-economic condition is measured as the sum of three sub-components: unemployment, consumer confidence, and poverty. Accordingly, the socioeconomic condition is scaled between 0 and 12, and each component has a maximum score of 4 points and a minimum score of 0 points. A score of 4 points equates to Very Low Risk (high socioeconomic condition) and a score of 0 points to Very High Risk (low socioeconomic condition).

To estimate equation (2) above, the study employed Pooled Mean Group (PMG) estimation technique by Pesaran et al. (1999). The PMG estimator restricts the long-run coefficients to be the same (that is, $\theta = \theta_i$ for all i), but allows the short-run coefficients and error variances to vary across countries. According to Pesaran et al. (1999), the homogeneity in the long-run relationship can be attributed to several factors such as: arbitration conditions, common technologies, or the institutional development which was covered by all groups. However, within the analysis framework of this study, the homogeneity in the long-run relationship may be the consequence of the common objective of improving life expectancy, reducing mortality rates, and achieving a sustained increase in overall economic development among African countries. Furthermore, the inclusion of these health-related issues in the United Nations’ Sustainable Development Goals (SDGs) as the major source of Sustainable Development, confirms that an international regime of “health-led-growth” is well established. In the short-run, however, the impact of health indices on economic growth may differ from country to country due to the specific circumstances of each country. As rightly stated by Samargandi, Fidrmuc, and Ghosh (2014), there is bound to be country-specific heterogeneity due to the effects of domestic laws and regulations. Therefore, since different African countries operate in different institutional settings and do not have the same health status, it is appropriate to use an estimator that permits distinguishing between short-term dynamics and long-term dynamics while also taking into account the heterogeneity of countries. In this case, the PMG estimator provides more efficient estimates when compared to the Mean Group and Fixed Dynamic Effects estimators under the assumption of long-run homogeneity.

RESULTS AND INTERPRETATION

Descriptive Statistics of Data

Table 1: Descriptive Analysis of Variables for All Countries (Combined Panel)

Time Period: 1990 – 2017 (33 Countries)					
Variables	Obs.	Mean	Std. Dev.	Minimum	Maximum
<i>LRGDP</i>	924	23.332	1.524	19.297	26.863
<i>LE</i>	924	56.445	8.055	35.705	76.078
<i>MR</i>	924	11.919	4.331	4.737	27.544
<i>FR</i>	924	5.138	1.359	1.991	7.772
<i>QOG</i>	924	0.405	0.137	0.042	0.898
<i>SOCIOECO</i>	924	3.855	1.608	0.500	8.000

Countries with Minimum/Maximum Values		
Variables	Minimum	Maximum
<i>LRGDP</i>	Liberia	Nigeria
<i>LE</i>	Sierra Leone	Algeria
<i>MR</i>	Algeria	Sierra Leone
<i>FR</i>	Tunisia	Niger
<i>QOG</i>	Liberia	Namibia
<i>SOCIOECO</i>	Zimbabwe	Cote D’Ivoire

Source: World Development Indicators (World Bank, 2017).

Author’s computation using STATA version 14.

The first part of table 1 presents descriptive statistics of variables from 1990 to 2017 covering 33 African countries. From the results, it can be seen that the mean of log of real GDP was about US\$ 23.33 (2015, constant) across the selected African countries with a standard deviation of about US\$ 1.52; and the minimum and maximum values of US\$19.30 and US\$26.8 respectively. Also, the average life expectancy across the countries was about 56 years with a standard deviation of about 8 years. Over the study period, the highest life expectancy was about 76.1 years while the minimum was about 35.7 years. Furthermore, the average mortality rate was about 11.92 per 100,000 populations. The lowest mortality rate was about 4.71 and the highest was about 27.54. Concerning the fertility rate, the minimum and maximum rates were respectively recorded as 1.99 and 7.77. However, the mean fertility rate across the selected countries was about 5.14 rates with a standard deviation of about 1.36 rates.

The results further revealed that the average quality of government across the countries was about 0.41 with a standard deviation of about 0.14. While the highest scale was about 0.90, the lowest was only 0.04. This implies that corruption was rampant in some countries which may be due to a lack of adherence to law and order as well as poor bureaucratic processes. Moreover, the average socioeconomic status across the studied countries was about 3.85 with a standard deviation of about 1.61, and the minimum and maximum values of about 0.50 and 8.0 respectively.

Estimation of Panel Unit Root Tests

Table 2: Results of Panel Unit Root Tests

Variables	Level		First Difference	
	Intercept	Intercept and Trend	Intercept	Intercept and Trend
First Generation Test: Im, Pesaran & Shin (IPS)				
<i>LRGDP</i>	13.435	-3.077***	-12.771***	–
<i>LE</i>	9.660	2.730	8.870	16.704
<i>MR</i>	6.053	5.034	9.131	13.532
<i>FR</i>	5.979	4.770	5.168	11.045
<i>QOG</i>	-4.488***	-4.947***	–	–
<i>SOCIOECO</i>	-5.581***	-3.997***	–	–
Second Generation Test: Pesaran’s CADF Test				

<i>LRGDP</i>	0.390	3.006	-15.897***	-15.082***
<i>LE</i>	4.703	1.746	-1.899**	-1.956**
<i>MR</i>	6.370	2.896	-1.576*	-4.402***
<i>FR</i>	-1.508*	-5.121***	—	—
<i>QOG</i>	-5.802***	-2.386***	—	—
<i>SOCIOECO</i>	-5.591***	-2.457***	—	—

Source: Author's computation using STATA version 14.

Note: ***, ** and * indicate significance at the 1%, 5% and 10% levels respectively.

Table 2 presents the results of panel unit root tests for all the variables of the study. From the results of the IPS test, it can be observed that all variables of health indicators are not stationary at both level and first difference. While real GDP as a proxy for economic growth is only stationary at a level using intercept and trend, it is found to be stationary using intercept after the first difference. For control variables, they are all stationary at a level using both intercept and intercept and trend at varying levels of significance. Contrary to the results of the IPS unit root test, the results of Pesaran's CADF test revealed that real GDP and LE are stationary at first difference. However, MR, FR, QOG and SOCIOECO are stationary at levels.

Based on the above results, there is a mixture of variables with I(1) and I(0) stationary processes. This invalidates the application of the Pedroni panel cointegration test which requires all variables to be stationary at the first difference, that is, I(1). Hence, the justification of using the panel ARDL cointegration approach.

Estimation of Country-specific Impact of Health Indices on Economic Growth

To examine the differences in the impact of health indices on economic growth across the selected countries, equation (2) was estimated using Pooled Mean Group (PMG) estimator while taking into account the heterogeneity of countries. The results of this estimation are presented in Table 3 as follows:

Table 3: Results of Country-specific Impact using PMG estimator

Dependent Variable: Log of Real Gross Domestic Product (LRGDP)						
Coefficients of Independent Variables						
Countries	LE	MR	FR	QOG	SOCIOECO	
Angola	-0.438 (0.258)*	-0.858 (0.404)**	0.265 (0.535)	0.624 (0.325)*	0.011 (0.017)	
Cameroon	-0.724 (0.166)***	-1.427 (0.310)***	-0.148 (0.182)	0.0477 (0.098)	0.046 (0.010)***	
Congo	-0.492 (0.189)***	-0.900 (0.336)***	-0.361 (0.119)***	0.403 (0.293)	-0.013 (0.013)	
Congo D. R.	0.724 (0.483)	0.917 (0.766)	(0.340) (0.214)	-0.126 (0.313)	0.066 (0.017)***	
Gabon	-1.100 (0.278)***	-2.926 (0.687)***	0.641 (0.172)***	-0.110 (0.167)	-0.012 (0.019)	
Ethiopia	0.046 (0.044)	-0.062 (0.119)	0.129 (0.364)	0.564 (0.152)***	0.019 (0.009)**	
Kenya	0.174 (0.050)***	0.359 (0.114)***	-0.378 (0.197)*	-0.099 (0.078)	0.012 (0.007)*	
Madagascar	0.031 (0.161)	0.114 (0.244)	-0.189 (0.338)	0.339 (0.228)	0.008 (0.025)	
Malawi	0.003 (0.041)	-0.035 (0.121)	-0.105 (0.145)	0.381 (0.317)	-0.013 (0.017)	
Mozambique	-0.404 (0.103)***	-0.879 (0.200)***	-0.833 (0.577)	0.412 (0.190)**	-0.007 (0.013)	
Uganda	0.075 (0.047)	0.098 (0.072)	0.134 (0.172)	-0.357 (0.181)**	0.017 (0.008)**	
Zambia	-0.064 (0.068)	-0.151 (0.108)	-0.812 (0.706)	-0.089 (0.124)	-0.011 (0.014)	
Zimbabwe	0.007 (0.111)	-0.165 (0.258)	0.076 (0.289)	-0.155 (0.304)	0.085 (0.036)**	

Algeria	0.123 (0.060)**	0.746 (0.305)**	-0.228 (0.127)*	-0.216 (0.109)**	0.002 (0.005)
Egypt	0.235 (0.091)**	0.436 (0.159)***	-0.112 (0.066)*	0.105 (0.089)	0.000 (0.007)
Morocco	0.385 (0.171)**	-0.272 (0.319)	-1.002 (0.420)**	-0.921 (0.200)***	0.008 (0.007)
Sudan	-0.342 (0.208)	-0.791 (0.412)*	0.060 (0.821)	0.160 (0.129)	-0.013 (0.009)
Tunisia	0.049 (0.049)	0.307 (0.156)**	-0.195 (0.157)	0.549 (0.132)***	-0.003 (0.006)
Botswana	-0.022 (0.049)	-0.045 (0.100)	-0.225 (0.345)	-0.033 (0.259)	0.001 (0.014)
Namibia	0.123 (0.086)	0.213 (0.180)	-0.096 (0.260)	-0.050 (0.104)	-0.019 (0.012)
South Africa	-0.007 (0.041)	0.020 (0.074)	0.275 (0.154)*	0.088 (0.073)	-0.003 (0.006)
Burkina Faso	0.175 (0.160)	0.130 (0.202)	4.554 (1.790)**	-0.335 (0.198)*	-0.024 (0.013)*
Cote D'ivoire	0.215 (0.148)	0.231 (0.252)	-0.234 (0.171)	-0.118 (0.182)	0.163 (0.008)**
Gambia	-0.832 (0.861)	-1.279 (1.315)	0.073 (0.929)	-0.004 (0.231)	0.011 (0.015)
Ghana	0.078 (0.079)	0.139 (0.167)	-0.013 (0.169)	-0.004 (0.158)	0.002 (0.007)
Guinea-Bissau	0.091 (0.193)	0.127 (0.279)	0.226 (0.950)	0.600 (0.712)	0.019 (0.043)
Liberia	-0.272 (0.332)	-0.683 (0.624)	9.831 (2.580)***	0.935 (1.123)	0.081 (0.073)
Mali	0.063 (0.232)	0.089 (0.303)	0.615 (0.515)	0.077 (0.178)	-0.009 (0.034)
Niger	-1.021 (0.317)***	-1.540 (0.474)***	2.320 (1.675)	-0.083 (0.206)	-0.004 (0.030)
Nigeria	-4.952 (1.499)***	-6.952 (1.994)***	-0.969 (0.414)**	-0.228 (0.226)	0.003 (0.017)
Senegal	-0.338 (0.097)***	-0.664 (0.194)***	-0.067 (0.040)	-0.029 (0.164)	0.016 (0.012)
Sierra Leone	-0.648 (0.316)**	-0.753 (0.342)**	-0.211 (0.091)**	-0.732 (0.387)*	0.185 (0.061)***
Togo	-0.745 (0.234)***	-1.376 (0.454)***	-0.781 (0.192)***	0.096 (0.443)	0.038 (0.011)***

Source: Author's computation using STATA version 14.

Note: Figures in () are standard errors. ***, ** and * indicate significance at the 1%, 5% and 10% levels respectively.

The results in table 3 above revealed that life expectancy, mortality rates, and fertility rates have different impacts on economic growth across the studied countries. For example, a 1% increase in life expectancy leads to a decrease in the economic growth of Angola by -0.44%, Cameroon by -0.72%, Congo by -0.49%, Gabon by -1.09%, Mozambique by -0.40%, Niger by -1.02%, Nigeria by -4.95%, Senegal by -0.34%, Sierra Leone by -0.65%, and Togo by -0.74%. This indicated that life expectancy has a more devastating effect on economic growth in Nigeria followed by Gabon and Niger. Although it has supported the findings of Modibbo, Muktar and Inuwa (2015) and Yaqub et al. (2012) for the case of Nigeria, the results is contrary to the a priori expectation of the study. This may be due to the prevalence of diseases and high unemployment which may reduce labour force participation, productivity, and consequently economic growth but will not reduce the life expectancy itself. In addition, as life expectancy increases, people tend to adjust their present consumption for future benefits after retirement. This means a reduction in present demand and investment which consequently reduces economic growth in the short-run. On the other hand, the impact of life expectancy on economic growth is positive and significant in Kenya, Algeria, Egypt, and Morocco. The results indicated a 1% increase in life expectancy in these countries brings about an increase in their economic growth by about 0.17%, 0.12%, 0.23%, and 0.39% respectively. The impact is more positive in Morocco, followed by Egypt and Kenya. These results are not surprising particularly in relation to Algeria that recorded the highest life expectancy of 76.08. In line with the works of Peykarjou, Gollu, Gashti, and Shahrivar (2011) and Ecevit (2013), high life expectancy implies improved health and living conditions which may enhance not only productivity of the workforce but also the level of savings, investment, and economic growth.

For mortality rate, the results showed that for every 1% increase, countries like Angola would experience a significant decrease in economic growth by -0.86%, Cameroon by -1.43%, Congo by -0.90%, Gabon by -2.93%, Mozambique by -0.88%, Sudan by -0.79%, Niger by -1.54%, Nigeria by -6.95%, Senegal by -0.66%, Sierra

Leone by -0.75%, and Togo by -1.38. This indicated that the mortality rate has a more negative effect on the economic growth of Nigeria followed by Gabon and Niger republic. These results have supported the findings of Dauda (2011) and Tolulope and Taiwo (2014) and can be attributed to the growing burden of diseases and security challenges particularly in Nigeria where insurgencies, banditry, and other socio-cultural and religious crisis have swept the lives of many people over the years despite the huge resources spent to overcome the crisis. Unexpectedly, the results revealed that the mortality rate has a significant positive impact on the economic growth of Kenya, Algeria, Egypt, and Tunisia where for every 1% increase, economic growth increases by about 0.36%, 0.75%, 0.44%, and 0.31% respectively. These results are contradictory particularly in the case of Algeria which recorded the lowest mortality rate over the period of the study. However, this could be buttressed by the work of Olabiyi (2014) and the theoretical argument of Ram and Schultz (1979) that increase in mortality has been an important incentive to increase investment in education which consequently promotes economic growth, saying that the post-war experience of India is consistent with this incentive. Thus, the results may be due to the responsiveness of these countries in averting the potential risk of preventable diseases and mortality through massive investment in health and education thereby promoting economic growth in the process.

In the case of fertility rate, the results showed that it has a significant negative impact on economic growth in Congo where a 1% increase in fertility rate reduces economic growth by -0.36%, Kenya by -0.38%, Algeria by -0.23%, Egypt by -0.11%, Morocco by -1.00%, Nigeria by -0.97%, Sierra Leone by -0.21%, and Togo by -0.78%. In terms of magnitude, the fertility rate has a more negative impact on economic growth in Morocco followed by Nigeria and Togo. This result is in line with the works of Hartmann (2010) and Peykarjou, Gollu, Gashti, and Shahrivar (2011). However, the negative impact of the fertility rate on economic growth in these countries particularly Nigeria, may not be unconnected with poor socioeconomic conditions which may result to high number of uneducated, unskilled, and low productive labour force in the country. Similarly, increase in fertility rate may lead to an increase in population in the long-run; and where there are no job opportunities to absorb the increased population, it may result to increase in unemployment, dependency ratio, social vices, and insecurity which cumulatively hamper the economic growth of the affected countries. The results further revealed that fertility rate has a positive and statistically significant impact on economic growth in Gabon, South Africa, Burkina Faso, and Liberia where every 1% increase in fertility rate brings about an increase in the economic growth of these countries by about 0.64%, 0.27%, 4.55%, and 9.83% respectively. Based on the results, fertility rate has more positive impact on economic growth in Liberia followed by Burkina Faso and Gabon. This may be attributed to investment in health and education necessary to raise children and ensure descent life.

With respect to control variables, the results indicated that a 1% increase in quality of government leads to a significant increase in economic growth in Angola by 0.62%, Ethiopia by 0.56%, Mozambique by 0.41%, and Tunisia by 0.55%; while the impact was negative and significant in Uganda by -0.36%, Algeria by -0.22%, Morocco by -0.92%, Burkina Faso by -0.34%, and Sierra Leone by -0.73%. The negative impact has supported the findings of Zalle (2018) who also found a negative impact of institutional quality on economic growth in Africa. This counter-intuitive the costs of following bureaucratic processes and law and order are excessive. This can demoralize investors who used to take advantage of illegal procedures in an economy with poor governance. In addition, this result means that in Africa, corruption allows investors to circumvent administrative and regulatory restrictions to get a high return on their investment. In this case, therefore, an increase in the quality of government may produce a perverse effect on economic growth.

On the other hand, the results revealed that socioeconomic condition has a significant positive impact on economic growth in Cameroon by 0.05%, Congo Democratic Republic by 0.07%, Ethiopia by 0.02%, Kenya by 0.01%, Uganda by 0.02%, Zimbabwe by 0.08%, Cote d'Ivoire by 0.16%, Sierra Leone by 0.18%, and Togo by 0.04%. Although this result contradicted the findings of Zalle (2018) who revealed that socioeconomic conditions have a negative effect on economic growth in Africa, the positive impact of socioeconomic conditions on economic growth can be justified by the fact that African countries are largely demand-driven economies which implies that a reduction in unemployment and poverty (i.e. improvement in socioeconomic

conditions) enhance the purchasing power and confidence of consumers and consequently the level of demand which in turn, stimulates investment and economic growth. However, the impact was significant but negative in Burkina Faso only, indicating that a 1% increase in socioeconomic condition decreases the economic growth of the country by -0.02%.

On the whole, the results showed that on a single country basis, there are significant differences in the impact of life expectancy, mortality rate and fertility rate on economic growth across the selected African countries in terms of the signs and magnitude as well as the significance or otherwise of the coefficients. Thus, the null hypothesis that says there are no significant differences is rejected at various levels of significance. This has buttressed the idea of Samargandi, Fidrmuc, and Ghosh (2014) who argued on the possibility of country-specific heterogeneity due to the effects of domestic laws and regulations. Therefore, these differences are not surprising given the fact that the selected countries operate in different institutional settings and do not have the same health status.

CONCLUSION AND POLICY IMPLICATION OF FINDINGS

The overall results of the study confirmed the existence of significant differences in the impact of life expectancy, mortality rate, and fertility rate on economic growth across the selected African countries in terms of the signs and magnitude as well as the significance or otherwise of the coefficients. In view of this, the study concluded that the extent to which health indices can affect economic growth across African countries strongly depends on a number of health determining factors prevailing in each country. This includes: population size, socioeconomic conditions, political stability, quality of institutions as well as better education opportunities, and greater access to quality healthcare services. The implication is that each country may require distinct policies, programs, and interventions necessary to improve the level of its health indices for the purpose of achieving economic growth and development, particularly in the short run. Thus, policy makers at various levels of government, international donor agencies; regional and continental organizations should take note of these differences when designing health-related development policies and programs for Africa countries.

Therefore, the study recommended that governments and health-related donor agencies should specifically increase the level of their spending on community health and medical services as this may improve the efficiency and effectiveness concerning prevention, diagnosis, and treatment of diseases that bedeviled some of the studied countries like Sierra Leon, Nigeria, and Niger which cause higher mortality and hampered human capital development. Above all, since the improvement in health indices is believed to increase labour participation rate, productivity, and income which in turn, leads to greater economic growth, governments of the selected countries should pursue strong health policies and programs in order to create preconditions for boosting the levels of health indices for increasing economic growth and development. This can be in form of increasing access to quality education, health services, and other social amenities by adopting the “Free-Service-For-All” approach particularly on women and children who are more vulnerable. Equally, there should be rigorous commitment to creating more job opportunities particularly through Public-Private-Partnership (PPP). Otherwise, improvements in health status accompanied by high unemployment will render the former to be ineffective in determining economic growth.

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ENERGY CONSUMPTION AND ECONOMIC GROWTH IN SELECTED AFRICAN COUNTRIES: A PANEL COINTEGRATION ANALYSIS

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Abstract

This study analyzed the relationship between energy consumption and economic growth in Africa. The main purpose of the study is to investigate the long-run equilibrium and short-run dynamics of economic growth in Africa when energy consumption changes. The study employed Pedroni's panel cointegration, using the unbalanced panel data analysis of 30 countries over the period from 1990 to 2019. The empirical results of the panel data cointegration tests support the existence of a long run relationship among energy consumption and GDP in Africa. The panel Dynamic OLS further reveals that a 1% increase in energy consumption GDP will increase by 0.417 % for the whole of African countries, 0.38% for the Africa oil producing countries and 0.239 % for the Africa Non-oil producing Countries in the long run. The result further indicates that there is bi-directional causality running from energy consumption to growth and vice versa. However, the study recommends that the Government should be careful in implementing policies such as energy rationing; energy price restructuring that can decrease the consumption of energy as it promotes economic growth.

Keywords: Energy, DOLS, Oil, Output, Income, Consumption.

INTRODUCTION

The use of energy in the world has been increasing substantially both in absolute and per capita. Consequently, energy per capita is one of the indicators that describe the economic development of a country. The study of the causal relationship between energy and GDP has been a subject of interest for many researchers because of the importance of energy to output and of output to energy in the process of economic growth and development.

The importance of energy could not be overemphasize, as it is a vital input in the production process and also an inclusive component in the production function alongside other factors such as land, labour, capital and entrepreneur; Similarly, Cheng & Lai (1997) were of the view that energy enhances the productivity of other factors of production.

In addition to this, energy sector development is essential for economic development and improved quality of energy services are expected to increase economic productivity (Toman & Jemelkova, 2003). Achieving economic growth and development is associated with the consumption of more energy resources.

Moreover, the use of energy in the world has been increasing substantially both in absolute and per capita. Consequently, energy per capita is one of the indicators that describe the economic development of a country. It can be argued that energy consumption is still unequal where the less developed countries (the case of African countries), consume a thin slice of the world's energy pie which hindered their potential to high economic growth.

African countries are endowed with different forms of energy resources in abundance that include both renewable and non-renewable. This energy can be harnessed to foster the economic growth and development of their respective countries. However, increased access to energy in some of the African countries has proved to be not only a continuous challenge but also a pressing issue with the international community (Odularu & Okonkwo, 2009).

Some countries in Africa have vast natural gas, coal, and renewable energy resources that could be used for domestic electricity generation. However, the countries lack policies to harness such resources and develop new (and improve current) electricity infrastructure. According to the EIA special report (Africa Energy Outlook 2012) for instance, in 2010 Nigeria's total energy consumption alone was about 111,000 kilotons of oil equivalent. Of this, traditional biomass and waste accounted for 82 per cent of the total energy consumption. Virtually, the same scenario applies to other African countries. This high percent share represents the use of biomass to meet off-grid heating and cooking needs, mainly in rural areas. Africa-Energy-Outlook report for 2014 indicates that in Africa as a whole, only 290 million out of 915 million people have access to electricity and the total number without access is rising.

African countries must address this persistent energy crisis which has weakened the industrialization process, and significantly undermined their effort to achieve sustained economic growth, increased competitiveness of domestic industries in domestic, regional and global markets and employment generation.

Empirically, the causal relationship between energy consumption and economic growth has been widely studied, yet, no consensus regarding this so-called energy consumption and growth nexus has been reached (Magazinno, 2011; Alam, Begum, Buysee & Huylenbroeck 2012). Previous research typically included few observations and might not have had the statistical power to detect the relationship, this study is significant as it fills the gap by employing panel analysis techniques involving 30 energy and non-energy producing countries in Africa. The paper is organized following section one (introduction) is literature review as section two, section three is the methodology the study adopted, section four present the result and discussion of the study and finally section five where conclusion and recommendations were presented.

LITERATURE REVIEW

Conceptual Issues

Energy consumption refers to the total energy used to perform actions, manufacture products or simply inhabit buildings. In the production process, total energy consumption could be measured by how much energy production process consumes which include electricity, gas, diesel, petrol, and any other energy sources such as animal products. In a household setting, energy consumption includes electricity, gas, water and any other energy used in making life easy. www.dexma.com

Economic growth simply refers to a change in the real Gross Domestic Product (GDP) of a country over time. The change must be sustained over a long period of time to distinguish it from mere cyclical fluctuations or a large harvest or transient phenomena (Kuznet, 1969). The theory of economic growth explains the level of output at any point in time and how each stage generates forces that propel the economy to the next stage.

According to Hellar, (1971) emphasized on the importance of an economy's factors of production (land, labor, capital and entrepreneurship) and their rate of change as being the main determinant of each stage of economic growth. Stanley (1996) defines economic growth as an increase in GDP occurring over a period of time usually a year or increase in real GDP per capita occurring overtime and an outward shift in the production possibility curve (PPC) (Jhingan, 2003).

Theoretical Issues

Orthodox and ecological economists disagree on the extent to which energy has been decoupled from economic growth, the causes of that decoupling and the potential for further decoupling. In the 1980s, the economists Khazzoom and Brookes independently put forward ideas about energy consumption and behavior.

Orthodox and ecological economists argue that increased energy efficiency paradoxically tends to lead to increased energy consumption. In 1992, the US economist Saunders dubbed this hypothesis the Khazzoom–Brookes postulate, and showed that it was true under neoclassical growth theory over a wide range of assumptions. Khazzoom (1980, 1987, and 1989) advanced a proposition that greater energy efficiency could lead to increased, not decreased energy demand.

More recently, Brookes (1990) has once again raised the contention in response to widespread discussion of the greenhouse effect, claiming that the energy efficiency solution is fundamentally flawed because "reductions in energy intensity of output that are not damaging to the economy are associated with increases, not decreases, in energy demand." Khazzoom-Brookes Postulate:

“With fixed real energy price, energy efficiency gains will increase energy consumption above where it would be without these gains”.

In growth theory terms, efficiency gains are described as technical progress trends. In a three-factor production function (Capital = K, Labour = L, Energy = E and Output = Y). Technical progress can be capital-augmenting, labour-augmenting, energy-augmenting, or neutral. Therefore, it is mathematically represented as follows:

$$Y = \tau_N F(\tau_K K, \tau_L L, \tau_E E)$$

Where τ_N = neutral technical progress
 τ_K = capital-augmenting technical progress
 τ_L = labor-augmenting technical progress
 τ_E = energy-augmenting technical progress

Technologies that improve energy efficiency will in general be a complex combination of all these forms of technical progress. Energy- augmenting technical progress could be called "pure" energy efficiency gain. Whereas motivation for the "base hypothesis" required no assumptions about the form of the production function, a growth theory-based response to the Khazzoom- Brookes postulate does.

Empirical Issues

This section is dedicated to the review of previous empirical studies on energy consumption and economic growth. There is a consensus in the literature that the maiden investigation into the energy consumption and economic growth relationship was the seminal work of Kraft and Kraft (1979). This study covered an annual data for the USA for the period 1947 to 1974 which supported the unidirectional causality running from GNP to energy consumption.

Farhani and Ben Rajeeb (2015) conduct a study on the relationship between economic growth (GDP) and energy consumption (EC) using panel data for 95 countries from 1971 to 2008. They use World Bank classification which divides the countries selected into four income groups of countries: low income group, lower-middle income group, upper-middle income group and high income group countries. To specify what matters, they use panel data analysis. The empirical results conclude that panel causality test reveals that there is a long-run Granger causality running from GDP to EC for low and high income countries and bidirectional Granger causality between GDP and EC for the lower-middle and upper-middle income countries.

In the same vein, Moosa (2014) analyzes the relationship between energy and economic growth in Indonesia. Data were collected from the Statistical Central Bureau for the period of 1999-2012. Gross Domestic Product (GDP) was used as an indicator of the economic growth, while energy that was used as a parameter that contributes to the economic growth was crude oil production. The study revealed that there are differences between crude oil production before and after the period of the energy crisis in Indonesia. In addition, crude oil production contributed to the economic growth by 30.8%.

The role of energy in economic growth has also been investigated by Almeida (2013) by developing a two-sector economic growth model, with a separation between energy related activities (Energy Sector) and the remaining economic processes (Non-energy Sector). The two-sector model was analyzed in comparison with the standard Solow growth model, adopting many of its simplifying assumptions. Results recommend that energy has an important role in economic growth, and energy variables closer to the productive processes in the economy are better suited to account for TFP and GDP variations.

In the study of energy and economic growth, David (2011) takes another dimension to review the relevant biophysical theory and mainstream, resource economics, and ecological economics models of growth. A possible synthesis of energy-based and mainstream models is presented and it shows that when energy is scarce it imposes a strong constraint on the growth of the economy but when energy is abundant its effect on economic

growth is much reduced. Time series analysis shows that energy and GDP cointegrate and energy Granger causes GDP when capital and other production inputs are included in the vector autoregression model. There are, however, various mechanisms that can weaken the links between energy and growth.

The empirical literature shows that energy used per unit of economic output has declined in developed and some developing countries, due to both technological change and to a shift from poorer quality fuels such as coal to the use of higher quality fuels, and especially electricity. Substitution of other inputs for energy and sectoral shifts in economic activity play smaller roles.

Methodology

This section is concerned with all the methods adopted in estimating the data. It presents the model used, types and sources of data used, and the methods of data analysis used.

Estimation Procedure

The analyses in this paper are carried out in three phases. Firstly, we conduct Panel unit root tests using two different methods namely Levin, Lin and Chu Test and Im, Pesaran and Shin Test. Second, Panel cointegration tests are performed using the Pedroni (1999) panel cointegration test and for the long-run relationship, Dynamic OLS is used to test the long-run cointegration vector. Thirdly, the panel Granger Causality Analysis was employed to assess the direction of causality.

Data Type and Source

The empirical analysis in this study is based on 30 selected African countries that include Algeria, Angola, Benin, Botswana, Cameroon, COB, Congo DR, Code I"Vore, Eretria, Ethiopia, Egypt, Gabon, Ghana, Kenya, Libya, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Senegal, South Africa, South Sudan, Sudan, Tanzania, Togo, Tunisia, Zambia and Zimbabwe. The study used annual time series data on the selected countries from 1990 to 2019. The data were sourced from World Bank data base publications and International Energy Agency (IEA).

Model Specification

Following Ghali and El- Sakka (2004), this study employs the Homogeneous Panel VAR Model (HPVM) on the assumption that the slope coefficients are set to be identical in the individual countries and the time index.

Thus;

$$\Delta\gamma_{it} = \alpha_i + \beta_{iit-1} + \gamma_{it} + \sum_{j=1}^k \theta_{ij} \Delta\gamma_{it-j} + \varepsilon_{it} \dots\dots\dots (i)$$

Compactly, Panel VAR can be re-specify as follow:

$$y_{it} = A_0i(t) + A_i(L) \gamma_{it-1} + u_{it} \dots\dots\dots (ii)$$

Where $i=1, 2, 3, \dots, N$ and $t=1, 2, 3, \dots, T$. y_{it-1} the period or time to be taken before the equilibrium is restored.

By taking into account the variables, the model is thus;

$$GDP = f(\ln Eng) \dots\dots\dots iii$$

However, the model is further re-specified in econometric form as follows:

$$\ln GDP = A_0i + \ln Eng_{it} + \dots\dots\dots (iv)$$

Before empirically analyzing the model, the variables are subjected to Panel unit root test using both cross sectional independence or cross sectional dependence techniques based on the assumption that both cross section and the time series should tend to infinity (). However, Levin, Lin and Chu (2002) and Im, Pesaran and Shin (2003) Panel Unit Root Tests were employed.

Levin, Lin and Chu (2002) popularly called LLC argues that individual unit root test should not be conducted separately for each of cross section rather for collective cross section with large sample and i to be homogenous across the cross section.

Thus;

$$\Delta y_{it} = 0i + \gamma_{it-1} + L = 1 \rho_{iL} \Delta y_{it-L} + \text{midmt} + i, t, \dots\dots\dots (v)$$

Where dmt represents the vector of deterministic variables and m_i is the corresponding vector of coefficients for model m , with $m = 1, 2, 3$.

Im, Pesaran and Shin (2003) popularly called IPS is a panel data unit root testing technique which suggest for averaging the ADF tests when u_{it} is serially correlated and allows for a heterogeneous coefficients of y_{it} .

$$\Delta y_{it} = 0i + \gamma_{it-1} + L = 1 \rho_{iL} \Delta y_{it-L} + \text{midmt} + i, t, \dots\dots\dots vi$$

Therefore, after application of Unit Root test, if each of the variables is stationary then the issue arises whether there exists a long-run equilibrium relationship between variables. For this purpose, panel co-integration developed by Pedroni (1999) is employed which allows the cointegration vector to vary across different sections of the panel and also for heterogeneity in the errors across the units. Thus;

$$\Delta W_{it} = \alpha + \beta_1 \Delta W_{it-1} + \beta_2 \Delta W_{it-2} + \dots + \beta_{p-1} \Delta W_{it-p+1} + \epsilon_{it} \quad (vii)$$

Where

$\mathbf{j} = -\mathbf{s} + \mathbf{j} + \mathbf{1}$, $\mathbf{s}, \mathbf{j} = 1, 2, \dots, \mathbf{p}-1$ and can be decomposed as the products of two $m \times r$ matrices, $\mathbf{J}$ and $\mathbf{B}$ with rank r (Johansen, 1995).

Granger Causality implies causality in the prediction (forecast) sense rather than in a structural sense. It starts with the premise that „the future cannot cause the past“ if event A occurs after event B, then A cannot cause B (Granger 1969). This concept can be examined in the context of a bivariate Panel VAR model which is zbar test based on an assumption that all coefficients are the same across all the sections as proposed by Holtz-Eakin (1986). Here, the test is on the following two equations:

$$Y_{it} = \alpha_0 + \alpha_1 Y_{it-1} + \alpha_2 Y_{it-2} + \dots + \alpha_{p-1} Y_{it-p+1} + \epsilon_{it} \quad (viii)$$

$$E_{it} = \alpha_0 + \alpha_1 E_{it-1} + \alpha_2 E_{it-2} + \dots + \alpha_{p-1} E_{it-p+1} + \epsilon_{it} \quad (ix)$$

$$1, i = 1, 2, \dots, n; j = 1, 2, \dots, p \quad (x)$$

Y = economic growth, E = energy consumption, α_0 = intercept, α_1 = slope t = time lag, B_{1x} = component of raw vector, β_{1j} = component of column vector

Note that the equations are a theoretical model to test the causality between the variables under study. A causality test is carried out when there is the presence of cointegration between the variables, to ascertain the direction of causality. The result may be bi-directional which implies that each variable can influence each other or unidirectional meaning that only one variable has influence over the other. However it is expected that the two variables, energy consumption and economic growth would have influenced each other.

Result and Discussion

Panel Unit Root Test

The results from the panel unit root test are presented in table I. Two (2) different methods were used at individual intercept; the tests include Levin Lin and Chu (LLC) and Im, Pesaran and Shin (IPS). All the variables are tested both at level and first difference with a constant and without a trend using 5% and 1% level of significance.

Table I: Panel Unit Root Test Result

Variable	Levin, Lin and Chu t^*		Im, Pesaran and Shin W-stat	
	Level	First Diff.	Level	First Diff.
All African Countries Africa				
LGDP	1.91224	-38.2167***	5.32621	-26.9030***
LENG	2.90132	-127.126***	4.24985	-44.4442***
African Oil Exporting Countries				
LGDP	3.00010	-16.7607***	5.50060	-17.2306***
LENG	-1.46333	-16.8170***	2.29147	-16.2762***
African Non-oil Exporting Countries				
LGDP	-0.15720	-36.2084***	2.25229	-21.0136***
LENG	5.44020	-126.127***	3.81506	-48.4483***

Source: Author's Computation, 2021 using Eviews 10 software.

Note that: ** and *** denote level of significance at 5% and 1% respectively
Probability or P-value in parenthesis

As it can be inferred from table I, the null hypothesis for unit-root cannot be rejected testing all the variables at levels. According to the test results for both LLC and IPS method, all variables across the African countries (All Africa, Oil Producing and Non-oil Producing Countries) with individual intercepts are non-stationary in their

Levels at both 1% and 5% levels of significance. After the first difference however, all the variables (GDP and ENG) were stationary at 1% level of significance. That is to say, all variables for both models (All Africa, Oil and Non-oil Exporting Countries) were found to be integrated of order one, I(1), this provides the prerequisite condition for the application of panel cointegration analysis so that long-run relationship between economic growth and energy consumption could be determined.

Panel Cointegration Test

The study employs Pedroni (1999) panel cointegration test in order to provide evidence for the existence of a long run relationship between growth and energy across the African countries as a whole, and based on oil/non-oil producing countries. The results of the analysis are reported in table II based on two different categories, that is, Within-group tests (panel statistics) consisting of four statistics and Between-group tests (group statistics) consisting of three statistics in order to conclude whether or not the panel variables are cointegrated.

Table II: Panel Cointegration Test Result

Test	Statistic Value using Intercept	Probability Value
All African Countries		
<i>Panel V stat.</i>	2919343	0.0018
<i>Panel rho stat</i>	-7.808702***	0.0000
<i>Panel ADF Chi2</i>	-5,144312***	0.0000
<i>Panel PP Chi2</i>	-10,28891***	0.0000
<i>Group rho</i>	-3,012032	0.0018
<i>Group PP</i>	-6,075419***	0.0000
<i>Group ADF</i>	-8,102609	0.0000
Energy Producing Countries		
<i>Panel V stat.</i>	3.966593***	0.0000
<i>Panel rho stat</i>	-7.192826***	0.0000
<i>Panel ADF Chi2</i>	-5.290082***	0.0000
<i>Panel PP Chi2</i>	-11.38320***	0.0000
<i>Group rho</i>	-2.663863**	0.0039
<i>Group PP</i>	-5.376695***	0.0000
<i>Group ADF</i>	-3.075387**	0.0011
Non-Energy Producing Countries		
<i>Panel V stat.</i>	0.082958	0.4669
<i>Panel rho stat</i>	-3.773798***	0.0000
<i>Panel ADF Chi2</i>	-1.870264*	0.0307
<i>Panel PP Chi2</i>	-3.761028***	0.0001
<i>Group rho</i>	-1.529362*	0.0631
<i>Group PP</i>	-3.080737**	0.0010
<i>Group ADF</i>	-1.875676*	0.0303

Source: Author's Computation, 2021 using Eviews 10 software.

Note that: *, ** and *** denote level of significance at 10%, 5% and 1% respectively
Probability or P-value in parenthesis.

Based on the result presented in table II, four statistics significantly reject the null-hypothesis of no cointegration at 1% level of significance with the exception of panel V-statistic, group rho-statistic and group ADF for all African countries. This proves the existence of a long run relationship between economic growth and energy consumption in Africa which corresponds with the findings of Fatai (2014) and Esso (2010). Also from the result for oil and non-oil producing African countries, all the statistics in the panel and group statistics reject the null hypothesis except panel V-stat in the Non-oil producing countries. In general, it could be concluded there exists a cointegration or long run relationship among energy consumption and economic growth variables for all African countries, Africa oil and non-oil producing countries.

Having found that there exists a panel cointegrating link between the two variables, the long-run cointegration vector was tested using the panel Dynamic Ordinary Least Square (DOLS) developed by McCoskey & Kao (1998) and Koa & Chiang (2000) which consists of lags and leads of the independent variables. It should be noted that the panel DOLS is less biased than the panel OLS and FMOLS estimators in small samples using

Monie Carlo simulations. Moreover, the panel DOLS estimator has better sample properties rather than the panel OLS and FMOLS estimators (Kao & Chiang, 2000).

Panel Estimation Coefficient

The cointegrating vector was estimated using the DOLS method estimator. The result of the estimations was reported in table III below so that the coefficient of estimation for the cointegration vector could be ascertained for all the models.

Table III(a): Dynamic OLS Result (GDP as a Dependent Variable)

Variable	Coefficient	P-value
All African Countries		
LENG	0.416934*** (0.024258)	0.0000
Africa Oil Exporting Countries		
LENG	0.382152*** (0.020270)	0.0000
Africa Non-oil Exporting Countries		
LENG	0.238980*** (0.114392)	0.0000

Author's Computation, 2021 using Eviews 10 software.

Note that: *, ** and *** denote level of significance at 10%, 5% and 1% respectively
Standard Error in parenthesis.

The estimated coefficients of the indicators of energy are all found to be statistically significant estimators at 1% and also positive for all the models. This result is the same with that of Eggoh, Bangake and Rault (2011). The results of the DOLS estimates confirm the existence of a long run relationship between energy and economic growth for All African Countries model. The same conclusion can be drawn for the other specifications (oil producing and Non-oil producing countries) of the sample although there is a slight difference in the magnitude of the results coefficient. Given that the variables are expressed in natural logarithms, the coefficients can be interpreted as elasticity.

The DOLS outcomes of this study presented in Table III above shows that there is a strong positive long-run relationship between GDP and energy consumption. The results on the All African Countries suggest that a 1% increase in energy consumption GDP increases by 0.417 %. Also, the result for Africa oil producing Countries reveals that one percent increase in energy consumption causes GDP to increase by 0.38%. Furthermore, a percentage increase in energy consumption in the Non-oil producing Countries causes GDP to increase by 0.239 %.

Table IV: Dynamic OLS Result (Energy Consumption as a Dependent Variable)

Variable	Coefficient	P-value
All African Countries		
LGDP	0.898632*** (0.107436)	0.0000
Africa Energy Producing Countries		
LGDP	1.954287*** (0.0102918)	0.0000
Africa Non-Energy Producing Countries		
LGDP	0.484769*** (0.041625)	0.0000

Source: Author's Computation, 2018 using Eviews 9 computer software

Note that: *, ** and *** denote level of significance at 10%, 5% and 1% respectively
Standard Error in parenthesis.

Table IV is the result of the DOLS estimation when energy consumption is considered as a dependent variable. From the result of each estimator, all the coefficients produced similar results in terms of the sign and statistical significance, although the magnitude of the coefficients differs. The result shows that all the coefficients are positive and statistically significant. The panel DOLS results indicate that a 1% increase in GDP energy consumption will increase by 0.90% for all African countries, and 1.95% increase in the oil producing countries.

Meanwhile, non-oil producing countries have the lowest energy consumption coefficient of 0.48% as GDP increases. This implies that there is a strong relationship running from energy consumption to GDP.

Panel Causality Test

After establishing that economic growth has a long-run relationship with energy consumption, there is a need therefore to examine the causal relationship between these two variables. The result is presented in the table below:

Table V: Panel Causality Result

Variable	LENG
All African Countries	
Energy does not causes Growth	13.941(1.E-06)***
Growth does not causes Energy	4.5490(0.0109)**
African Energy Producing Countries	
Energy does not causes Growth	3.7010(0.0255)**
Growth does not causes Energy	5.0163(0.0070)***
African Non-Energy Producing Countries	
Energy does not causes Growth	5.5366(0.0043)***
Growth does not causes Energy	3.6410(0.0274)**

Source: Author's Computation, 2018 using Eviews computer software

Note that: *,** and *** denote level of significance at 10%, 5% and 1% respectively
Probability values in parenthesis.

The results depicted in table V shows that, based on the significance of the p-values, a bi-directional causality runs from per capita energy consumption to economic growth and from economic growth to energy in the selected All African countries; same relationship exist in Africa Oil-producing countries and Africa Non-oil producing countries. This empirical result is consistent with the findings of Farhani and Ben Rajeeb (2015), but differs from that of Akinlo (2008). The result indicates that, increase in energy consumption increases production of goods and services. Increase in the production of goods and services promote economic growth. As a result of economic growth more energy will be demanded due to increase in income, industrial growth and structural development.

Conclusion and Policy Recommendations

From the result it is found that energy consumption has a positive and statistically significant impact on economic growth in the long-run. Therefore, energy is an important contributing factor to economic growth for African countries. Moreover, it is clear that energy serves as an engine of economic growth and changes in energy consumption brings a significant impact on economic activity hence serve as an indicator of economic growth of a nation. All African countries as well as oil and non-oil producing countries should be cautious in the policies that can affect energy consumption as there exists a strong bi-directional causal relationship between the variables.

Base on the findings of the study and in view of the complementary relationship between energy consumption and economic growth in Africa, the following recommendations are paramount:

- i. Government should be careful in implementing policies such as energy rationing, energy pricerestructuring that can decrease the consumption of energy as it promotes economic growth.
- ii. More resources should be committed to research in energy taking into consideration the continent's energy resources.

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THE NEXUS BETWEEN MONETARY POLICY AND FINANCIAL DEEPENING IN NIGERIA

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Abstract

This study empirically examined the effects of monetary policy on financial deepening in Nigeria over the period of 1990 to 2019. The data used were obtained from central bank of Nigeria statistical bulletin (2019), Nigeria bureau of statistics. The techniques of analysis employed were Augmented dickey fuller unit root tests for stationarity where, money supply and monetary policy rate were stationary at level while exchange rate, credit to private sector and real gross domestic product were stationary at first difference, descriptive statistics, co-integration test for long run relationship, ordinary least square method of estimation for analysis of relationship among the variables. The results revealed that the explanatory variables explained 99.3% of the variations in financial deepening in Nigeria. The F statistic showed statistical significance of the model. The study also discovered that credit to private sector positively and significantly impacted broad money supply (proxy for financial deepening) while exchange rate, real gross domestic product had a positive impact though not significant. Monetary policy rate was found to exert a negative impact and not statistically significant. The study concluded that credit to private sector is very important to broad money supply (proxy for financial deepening) in Nigeria within the period under study, this means that more attention should be given to CPS, also there should be a periodic review and complimentary measures of MPR by the monetary policy committee to boost the impact of MPR on broad money supply.

Key words: Monetary policy, financial deepening, Nigeria, 1990-2019.

INTRODUCTION

The monetary policy of any given country no doubt, goes a long way towards shaping both the direction and volume of credit in the economy. Therefore, the need for a sound and effective monetary policy can hardly be over emphasized. It will suffice to observe that various monetary authorities have continued to monitor the performance of their individual country monetary policy mainly because of the perceived role it plays in achieving sound economic development.

The financial sector of every nation plays a critical role in harnessing resources for productive activity. The financial sector also ensures that resources are efficiently mobilized and allocated in a manner that will enhance the development of the economy. As identified by Ahonkhai (2018), the financial sector performs critical activities such as the provision of securities markets, fund management, insurance, pension services and risk management. Financial deepening may be regarded as the ability of the financial system to supply funds to the government and the private sectors (Caballero & Krishna-Murthy, 2004). Adequate financial deepening therefore suggests that a nation's economy has good financial instruments, institutions and possesses the ability to provide short term financial intermediation for rapid economic growth. Financial deepening is also regarded as financial depth. Financial deepening shows the level of development of financial markets by way of efficiency of financial intermediation (Honohan, 2004). Klein and Olive (2008) noted that the greater the financial deepening, the more significant is the ability of the financial sector to reallocate financial resources in support of economic development. Mirkin, Kuznetsova & Kuznetsov (2013) aver that financial deepening

Reflects the compatibility between the volume of production and the size and structure of the financial sector in terms of savings, investments and redistributive mechanisms particularly via financial instruments.

With the rapid globalization of financial markets, concern has heightened over declines in the level of savings, investment and financial deepening in many developing countries, particularly, those of Sub-Saharan Africa (SSA). This concern has exerted pressures on national monetary authorities to re-examine and re-evaluate their domestic monetary policies with a view to finding probable solutions. In Nigeria, the Structural Adjustment Program was introduced in 1986 to among other things, correct the structural imbalances in the Nigerian economy and to liberalize the financial and payment systems. In this connection, interest rates were de-regulated the process of licensing new banks simplified.

Since 1986, the government through the central bank of Nigeria has employed various monetary and structural policies aimed at deepening the financial system and aimed at reducing repression in the banking sector. These measures include the licensing of new banks in order to enthrone the market principle of free entry and free exit into the banking sector, the introduction and strict enforcement of prudential guidelines and mass disqualification of unfit and improper personnel in the management of banks. Others include the abolition of sectoral credit allocation and interest rate ceilings, deregulation of interest rate regime and the tenfold increase in minimum paid up capital requirement by banks aimed at strengthening the operational viability of the banks and the mass liquidation of distress banks in order to eliminate contagion effects.

Despite the introduction of these various monetary and structural policies aimed at deepening the Nigerian financial system, bank failures have continued to occur, while the economy grow marginally. It is against this backdrop that the study intends to investigate the impact of monetary policies on financial deepening in Nigeria from 1990 to 2019. The study shall rely on the statistical inference of test methodology in testing the several indicators which have been selected a priori in order to ascertain if monetary policies has actually led to financial deepening in Nigeria between 1990 and 2019.

LITERATURE REVIEW

Conceptual Review

Anowor et al posits that monetary policy is one of the key drivers of economic growth and development through its impact on economic variables.

From the above therefore Monetary policy can be seen as a macroeconomic variable that that major objectives are the attainment of price stability and sustainable economic growth.

Florence et al define Financial deepening as the ratio of money supply to gross domestic product. It seeks to establish how the supply leading side of money contributes to the development in the financial markets of the financial system and ultimately the growth of the economy. The higher the money supply, the more accessible to funds by investors for investments.

Theoretical Framework

The theoretical framework upon which this paper is based is the Keynesian theory of monetary policy.

The Keynesian Theory of Monetary Policy

In the Keynesian analysis, monetary policy plays a crucial role in affecting economic activity but did not agree with the classical view that the supply of money influences the price level directly and that the economy always stays at full employment level. They also rejected the notion that the velocity of circulation of money is constant. Instead the Keynesians believed in an indirect link between money supply and real GDP. They contended that an expansionary monetary policy increases the supply of loanable funds through the banking system causing interest rate to fall. With lower interest rates, aggregate expenditures on investment and interest-sensitive consumption goods usually increases causing real GDP to rise. The increased investment will raise effective demand through the multiplier effect thereby increasing income, output and employment (Jhingan, 2010).

The Keynesians, however, remained skeptical about the efficacy of monetary policy under certain conditions. They argued that expansionary monetary policy that increases the reserves of the banking system need not lead to a multiple expansion of money supply because banks can simply refuse to lend out their excess reserves. Furthermore, the lower interest rates that result from an expansionary monetary policy need not induce an increase in aggregate investment and consumption expenditures because firms and households demands for investment and consumption goods may not be sensitive to the lower interest rates. The Keynesians believed in the concept of liquidity trap which is a situation in which real interest rates cannot be reduced by any action of

the monetary authorities. Hence, at liquidity trap, an increase in the money supply would not stimulate economic growth because of downward pressure of investment owing to insensitivity of interest rate to money supply and the only way out is fiscal policy. For these reasons, the Keynesians placed less emphasis on the effectiveness of monetary policy and more emphasis on fiscal policy, which they regarded as having a more direct effect on real GDP (Adefeso and Mobolaji, 2010; Jhingan 2010). In the Keynesian monetary policy, the rate of interest is determined by the demand for and supply of money and changes in equilibrium rate of interest are caused by changes in demand and supply of money. Since the supply of money is determined by the monetary authority which is normally fixed in the short run, then the money supply curve is perfectly inelastic. The Keynesians viewed the demand for money as the desire to hold cash for transaction, precaution and speculative purposes. The speculative demand for money depends upon the rate of interest or bond prices while the precautionary and transaction demand for money depends on the level of income. In a situation of unemployment, Keynes posited that unemployment arises from inadequate aggregate demand which can be increased by increase in money supply which generates increase spending, increase employment and economic growth (Onyeiwu, 2012).

Empirical Review

Adofu (2010), studied monetary policy reforms and financial deepening in Nigeria over a period of 1970-2004. Using the ordinary least squares method, the study found out that monetary authorities have deepened the Nigerian financial system. The study also found out that interest rate regimes to be more market driven and less negative in real terms, bank lending and national income increased, national saving expended. The study recommended that the central bank of Nigeria should ensure constant supervision of the banks and other financial institutions.

Anowor & Okorie (2016) in a study “reassessment of the impact of monetary policy on economic growth in Nigeria” adopted the error correction model approach, the study utilized time series secondary data spanning between 1982 and 2013. The findings revealed that a unit increase in cash reserve ratio (CRR) led to approximately seven units increase in economic growth in Nigeria. The result was in line with economic growth and price stability. The study recommended that monetary authorities should give major attention to cash reserve ratio (CRR) monetary policy tool as it will produce a more desired result in terms of economic stabilization.

Ademefa & Obamuyi (2018) studied the effect of financial deepening and the performance of manufacturing firms in Nigeria from 1970 to 2016 and the study employed the Augmented Dickey-Fuller, Philips-Perron and Breusch pagan Godfrey test to ensure robust regression results. The model was specified and hypotheses were tested with the Autoregressive Distributed Log model and mann-whitney U test. Results obtained from the study revealed that broad money supply has direct and significant impact on index of manufacturing production in Nigeria in the long run and a direct and insignificant impact in the short run. The study also found out that financial deepening impacted more on the manufacturing sector performance in the post-financial reforms period. Based on its findings, the study encouraged that government should launch new financial reforms capable of enhancing the accessibility of manufacturing sector to credit and also ensure adequate implementation and monitoring of the existing policies on financial reforms in Nigeria with a view to deepening the Nigerian financial system.

Idris (2019) studied the relationship between monetary policy and economic growth in developing countries using time series data, co-integration test and the ordinary least square (OLS) technique in estimating the model coefficients and showcase the policy nexus between the variables. The study found the existence of long run relationship between monetary policy indicators and economic growth, the study also found that money supply has positive effect while both exchange rate and interest rate have negative effect on the real GDP. Based on this findings, the study encouraged that monetary authorities in Nigeria should adequately manage and monitor the growth level of money supply in order to realize the desired growth level with the socio-economic and political conditions in Nigeria. There is growing needs to formulate appropriate monetary measures which might encourage borrowing through sound and productive interest rate as well as exchange rate.

Oparah & James (2019) examined the impact of monetary policy on financial stability in the Nigerian banking industry for the period of 2008 and 2016. Using error correction model, the findings revealed that the impact of monetary policy on financial stability in the Nigerian banking industry was weak. The study revealed a significant long run equilibrium relationship between monetary policy and financial stability in the Nigerian banking industry with a speed of adjustment to long run equilibrium of 66.54% are more effective channels of transmitting monetary policy to financial stability in the banking industry than interest rate channel.

Nwajiaku, A. & Obi-Nwosu (2020) examined the effect of financial deepening on entrepreneurial growth in Nigeria using the Granger causality test with autoregressive distribute log (ARDL) technique of model estimation using data from 1986 to 2018, the study found out that there is no significant effect of financial

deepening on entrepreneurial growth. However, entrepreneurial growth was found to significantly influence financial deepening through banking and insurance sector deepening. Based on the findings of the study, the study encouraged that the monetary policy rate should be lowered to a single digit as against the current double digit (14%) by the central bank of Nigeria.

Methodology

This study focuses on monetary policy and financial deepening in Nigeria. The Ex-post facto research design is deployed. The study used time series data sourced from Central Bank of Nigeria statistical bulletin (2019), having a scope of (29) years that is from 1990 to 2019. The study used the following variables; Broad money supply (M2) which is both the proxy for financial deepening and independent variable. Other variables include; Exchange rate, Monetary policy Rate (which are policies under the control of monetary authorities), Real Gross Domestic Product and Credit to Private sector.

Model Specification

This study adapts the model of Adofu, (2010) with a slight modification in the model, where interest rate is replaced with Monetary policy rate and aggregate credit to the economic is replaced with credit to private sector. Hence the functional form of the model is given as

$$MS = f(EXCH, MPR, RGDP, CPS) \dots\dots\dots 1$$

Since the variables entered the model in a log linear form, equation 2 is given as

$$\text{Log MS} = \beta_0 + \beta_1 EXCH + \beta_2 MPR + \log \beta_3 RGDP + \log \beta_4 CPS + U_t \dots\dots\dots 2$$

a priori expectation ($b_1 < 0$, b_2 , b_3 , $b_4 > 0$)

Where;

MS = Broad Money Supply
EXCH= Exchange Rate
MPR = Monetary Policy Rate
RGDP = Real Gross Domestic Product
CPS= Credit to private sector
 U_t = White noise
 b_1, b_2, b_3 = Parameters to be determined.

PRESENTATION AND DISCUSSION OF RESULT

Unit Root Tests for Stationarity

A test of stationarity that has become widely popular over the past several years is the unit root test. A time series is said to be stationary if it's mean and the value of the covariance between the two time periods depends only on the distance or gap or lag between the two time periods and not the actual time at which the covariance is computed (Gujarati, 2009). In this study, the Augmented Dickey-Fuller (ADF) is applied to test for stationarity.

The general specification of the unit root model is given as follows;

$$\Delta Y_t = B_1 + B_2 + \partial Y_{t-1} + \sum_{t=1}^{\infty} \alpha_t \Delta Y_{t-1} + U_t \dots\dots\dots (5)$$

Where Y_t is the variable under investigation and U_t is a random error term.

Table 1: Augmented Dickey Fuller Unit Root Test

Series	Type of test	Critical values			Order of co-integration
		1%	5%	10%	
LMS	-3.44	-3.67	-2.96	-2.62	1 (0) **
MPR	-3.09	-3.67	-2.96	-2.62	1 (0) **
EXC	-4.43	-3.68	-2.97	-2.62	1 (1)*
LCPS	-3.64	-3.68	2.97	-2.62	1(1)**
LRGDP	-4.90	-3.68	-2.97	-2.62	1(1)*

Source: Researcher's computation using E views 9

Table 1 above reveals the stationarity of the variables used where money supply and monetary policy were stationary at levels while Exchange rate, credit to private sector and Gross Domestic product became stationary after first difference.

Descriptive Statistic

Table 2

Stat Properties	LMS	EXC	MPR	LCPS	LRGDP
Mean	7.789	123.78	13.645	7.245	9.45
Median	7.833	127.24	13.500	7.129	9.465
Maximum	10.279	307.20	26.000	9.77	11.879
Minimum	4.229	8.037	6.000	3.513	6.158
Std. Dev.	1.927	92.142	3.833	2.000	1.736
Skewness	-0.291	0.637	0.765	-0.2521	-0.27
Kurtosis	1.751	2.758	5.369	1.826	1.986
Jarque.Bera	2.373	2.10	9.952	2.03	1.66
Probability	0.305	0.349	0.006	0.360	0.434
Obs	30	30	30	30	30

Source: Researcher's computation using E views 9

The result in table 2 shows a descriptive analysis of the variables. It shows, the mean, median, maximum, minimum, standard deviation, skewness, kurtosis, jarque-bera, probability for broad money supply (proxy for financial deepening), exchange rate, monetary policy rate, credit to private sector, real gross domestic product, from 1990 to 2019, from the result we will observe that the mean values of broad money supply, exchange rate, monetary policy rate, credit to private sector, real gross domestic product are 7.789,123.78,13.645,7.245 and 9.45 respectively. This shows that the variables during the period of study have positive values. This implies that the variables have grown on the average during the study period. The values of standard deviation for broad money supply, exchange rate, monetary policy rate, credit to private sector, real gross domestic product are 1.727,92.142,3.833,2.000, and 1.736 respectively.

Co- integration Analysis

Based on the unit root test, the next, is the co-integration test to determine if the variables under study (LMS, MPR, EXCR, LCPS, LRGDP) have a long run relationship. The co integration technique can be used if two series are integrated of the same order.

Table 3: Johansen Co-integration test

Hypothesized No of CE(s)	Trace Statistic	Critical Values 0.5	Hypothesized No of CE(s)	Max Eigen Statistics	Critical Value 0.5
None*	94.94334	69.81889	None	41.67296	33.87687
Almost 1*	53.27038	47.85613	Almost 1	27.39628	27.58434
Almost 2	25.87410	29.79707	Almost 2	17.44966	21.13162
Almost 3	8.424446	15.49471	Almost 3	5.084953	14.26460
Almost 4	3.339493	3.841466	Almost 4	3.339493	3.841466

Trace test indicates 2 cointegrating eqn (s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

The co-integration results in table 3 for the variables, (MS, EXCR, MPR, CPS, RGDP) reveals that both the trace statistic indicate 2 co-integrating equations at 5% level of significance while max eigen value test indicates 1 co-integrating equation(s) at 5% level of significance. This indicates that there is a long run relationship between monetary policy and financial deepening in Nigeria. We therefore reject the null hypothesis of no co-integration amongst the variables but accept the alternative hypothesis.

The confirmation of the existence of co-integration among the variables, we proceed to employ the ordinary least square method of estimation.

Table 4 Regression Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.492684	0.643539	2.319491	0.0288
EXC	0.001757	0.000855	2.056093	0.0504
MPR	-0.020699	0.011170	-1.853126	0.0757
LCPS	0.843352	0.129371	6.518874	0.0000

LRGDP	0.026602	0.152376	0.174581	0.8628
R-squared	0.993293	Mean dependent var	7.789520	
Adjusted R-squared	0.992220	S.D. dependent var	1.927248	
S.E. of regression	0.169990	Akaike info criterion	-0.555139	
Sum squared resid	0.722418	Schwarz criterion	-0.321606	
Log likelihood	13.32708	Hannan-Quinn criter.	-0.480430	
F-statistic	925.6407	Durbin-Watson stat	0.819950	
Prob(F-statistic)	0.000000			

Table 4 presents the regression results for the model. It shows that the explanatory variables included in the model explained 99.2 percent of the variations in broad money supply (proxy for financial deepening) in Nigeria. The coefficient C shows a positive and significant relationship between the dependent and independent variables in the long run.

The result reveals a positive relationship though not statistically significant between real gross domestic product, exchange rate and money supply given the probability values of 86.2% and 5.04% respectively. However, the result also reveals that there exist a positive and statistically significant relationship between broad money supply and credit to private sectors at 0.0000% probability value. This means that a unit change in CPS will result to 84.3352% rise in money supply. The result also revealed that monetary policy rate has a negative relationship but statistically insignificant. This negative relationship can be attributed to the meagre money in the vault of the central bank of Nigeria which could not exert a significant impact on money supply for the period under study.

The F-statistic shows that the model is statistically significant and that the independent variables are significant explanatory factors of the dependent variable. The above implies that the model has a goodness of fit. The Durbin Watson statistic of 0.819950 reveals that there is no presence of serial correlation among the variables used in the model.

CONCLUSION AND RECOMMENDATION.

The empirical analysis has confirmed that monetary policy measures (exchange rate, real gross domestic product, monetary policy rate) except credit to private sector have not achieved the desired objective of deepening the financial system of Nigeria, this could be related to the sluggish growth rate as the economy is characterized by high and volatile inflation, distorted interest rate and exchange structures and low level of financial intermediation. The study assessed the impact of monetary policy on financial deepening in Nigeria from 1990 to 2019 using secondary data. The result has led to the conclusion credit to private sector has impacted significantly on broad money supply (proxy for financial deepening) in Nigeria. While exchange rate, real gross domestic product has positive impact though not statistically significant. Monetary policy rate has a negative impact and not statistically significant on broad money supply.

Based on the findings, the following recommendations were made; Monetary authorities should pay more attention to credit to private sector as it significantly impact broad supply (proxy for financial deepening) in Nigeria.

Monetary policy authorities should review periodically monetary policy rate and complimentary measures to boost the impact of monetary policy rate on broad money supply.

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ANALYSIS OF COST AND RETURN OF TRADITIONAL MILK PRODUCTION IN GANJUWA LOCAL GOVERNMENT AREA OF BAUCHI STATE NIGERIA

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Abstract

The study examined the cost and returns of traditional milk production in Ganjuwa local Government Area of Bauchi State. Ninety-Five respondents were selected using purposive sampling techniques and structured questionnaire were administered to collect information. The data collected were analyzed using descriptive statistics and multiple regression analysis. The result shows that traditional milk producers have a mean of 36 years and a household size of 6-10 was prevalent amounting to about 47.37%. Similarly about 52.63% of the respondents possessed cattle heads of 30 and below. All the inputs used in the traditional milk production were used profitably in the study area hence the finding indicated a profitable venture. Furthermore, the study observed that 58.6% of the variation in the total revenue was accounted for by the variables included in the model. Herd size was significant at $p < 0.001$, age at first calving and level of education of pastoralist were also significant at $p < 0.005$. However, major constraints affecting traditional milk production includes; in-adequate grazing reserves and water sources, absence of cattle routes and lack of access to affordable veterinary services and drugs. It is therefore recommended that traditional milk production under pastoralist could best be achieved through improving feeds supply by establishing pastoral lands and rehabilitation of existing ones, increasing the efficiency of the veterinary and extension services, so as to encourage the cross breeding of the local breeds with improve breeds for improvement, construction of earth dams and boreholes and provision of more cattle routes.

Keywords: Analysis, Cost, Returns, Milk, Production and Ganjuwa

INTRODUCTION

Population increases, rapid urbanization and rising income continue to derive demand for animal products upward and the supply-demand gap continues to widen, yet the production system remains largely underdeveloped (Taiwo *et al*; 2007).

Sub-Saharan Africa, with a population of 640 million people and Nigeria with an estimated figure of 187 million people as at 2016, which is expected to reach 2.5 billion and 226 million respectively by the year 2050 (Population Reference Bureau 2016), will require substantial quantity of food, especially that of animal origin. Milk and meat are the most important sources of animal protein in sub-Saharan Africa and these products have a

potential to improve, even in small amount, diet based on either one or two food crops characteristic of the region.

Ruminants, comprising sheep, goats and cattle, constitute the farm animals largely reared by farm families in the country's agricultural system. Nigeria has population of 34.5million goats, 22.1million sheep and 13.9million cattle. The larger proportion of these animals' population are however largely concentrated in the northern region of the country than the southern region. Specifically, about 90 percent of the country's cattle population and 70 percent of the sheep and goat populations are concentrated in northern region of the country Adegbola. (1982). Concentration of Nigeria's livestock-base in the northern region is most likely to have been influenced by the ecological condition of the region which is characterized by low rainfall duration, lighter sandy soils and longer dry season (Lawal-Adebawale 2012).

Milk is exceptionally a good source of protein which is of high biological value in promoting the growth of young (Hecorange and Ngoddy, 1985). From nutritional point of view, it provides the nation with a basic food containing practically all the essential ingredients to promote and maintain life i.e. protein, carbohydrate, fat, Mineral and vitamins. Milk industry remains rural and traditional with Fulani pastoralist controlling about 95% of the national herd (FAO, 1990). The producers are peasant and are often located at some considerable distance from the urban centers and are generally scattered among the rural communities. These producers supply rural consumers and much of the milk is consumed in the household where it is produced or near-by communities. These producers practice no selection or breeding for the improvement of milk yield and other traits desirable in good dairy animal. There is no record of any type, hence productivity of the animal is often difficult to determine. They do not cultivate pasture but rely on grazing in the open ranges, usually following their animal to fresh feeding ground with the change of season (Looshi *et al.*, 1999).

The system of production and facilities are poor by modern dairy standards, although there are thousands of such producing units, they are hardly enough to provide the basis for a decent standard of living for those dependent on them. There are relatively few good dairy cows among the millions of cattle found under this system of production. Nevertheless, they account for approximately 80-90% of the total milk supply in tropical Africa where dairy is unorganized (Looshi *et al.*, 1999).

The annual collectable milk from the national herd is approximately 650,000 tones (Anon, 1999). According to the World Bank (1991), Africa produced about 10 million metric tons (MT) of milk in 1988 but the average annual per capita consumption of dairy products in Sub-Saharan Africa is about 27kg (O'Conner, 1993). The import of dairy products into sub-Saharan Africa has increased steadily since 1996 the nominal value of these product is from US\$680 million in 1980 (Vom Massaw, 1989), an outrageous sum of the countries of the region.

Presently, the local production of milk is less than 1% of the total annual demand that has been estimated at 1.45 billion liters, making the total milk consumption in Nigeria less than 10 liters per head whereas the global average is about 40 liters per head. In other parts of Africa, it is 28 liters per head. It has been estimated that about 500,000 cows and between 300,000 to 400,000 hectares of land is required to meet the national demand of the country (RM. 1990). In view of this fact, a research in this area is worth undertaken.

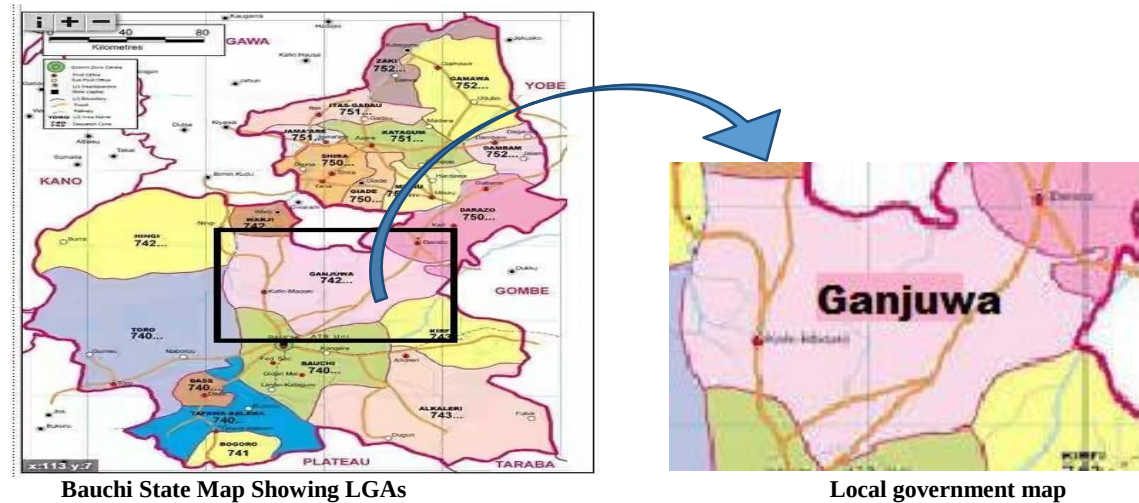
METHODOLOGY.

Study Area.

Ganjuwa Local Government Area covers an estimated area of 3,372km². Kafin Madaki is the Local Government Headquarter. It is located about 44 kilometers North of Bauchi Town, the State capital. The area falls between latitude 9°30" North and 10°30" North of the equator and Longitude 10°11" East and 30°00" East, it has a population of about 161.437 thousand inhabitants based on the 2006 National population Census, most of whom live in the rural areas. The local government shares a common boundary with Ningi and Warji L.G.A's in the north-west, Bauchi and Kirfi L.G.A's in the south, Gombe State in the east, Darazo L.G.A in the North-east and Jigawa State in the North.

The vegetation of the area is savannah and rich in terrain, possessing all physical features like sandy, loamy and hilly, thick woody forest and grazing land. The hottest season in the area is around April to May while the coldest months are December, January and part of February. The mean relative humidity varied between 19% and 79%, the lowest value is from January – March. The mean monthly temperatures were between 26.9°C and 33.54°C. August and September are the month with heaviest rainfall. The average annual rainfall is about 862mm.

The major occupations of the inhabitants are farming, trading, cattle rearing, fishing, and handcrafts, weaving, iron bending and blacksmithing. While major tribe in the area are, Denawa, Gerawa, Sirawa, Miyawa, Hausa, Fulani and Fa'awa, located in different areas. The major towns are Kafin Madaki, Soro, Miya, Zalanga, Ganjuwa, Kariya, and Nasarawa (information unit, Ganjuwa L.G.A.) 1988.



Sampling Technique.

Pastoralist milk producers were identified and selected with the aid of the pastoralists head or “*Hardo*” of the area through visits. Ninety-five (95) respondents were purposively selected and questionnaires were administered with the aid of enumerators. The questionnaires were administered according to the number of respondents in the villages: Kafin-Madaki (20), Filin Shagari (35), Soro (20), and Miya (20). The high number of questionnaires distributed in Filin Shagari was due to the high concentration of respondent in the area.

Data collection.

The information collected includes; the socio-economic characteristics of the pastoralist, milk production variables such as herd size, management system, cost of feeds, medication and the constraints associated with traditional milk production.

RESULT AND DISCURSSION

Socio-economic Characteristics of the Pastoralist.

Socio-economic attributes of the pastoralist considered in the study includes; Age, educational level, household size and herd size. Result of the socio-economic characteristics is presented in Table 1.

Table 1: Socio- economic Characteristics of the Respondents

Variables	Frequency	Percentage
Age		
18 – 25 years	7	7.37
26 – 35 years	45	47.37
36 – 45 years	30	31.58
46 – 50 years	10	10.53
51-50 years	3	3.16
Educational Level		
Primary	3	3.16
Qur'anic	88	92.63
Never go to school	4	4.21
Household size		
1-5	23	24.21
6-10	45	47.37
11-15	15	15.79
16-20	7	7.61
Above 20	5	5.26
Herd size		
<30	50	52.63
40-89	30	31.58
90-149	8	8.42
150-199	5	5.26
200 and above	2	2.11

Source: field survey December 2020.

The age distribution of the pastoralist in Table 1 shows that, there was no milk producer younger than eighteen years and older than fifty years. 47.37% of pastoralists are between the ages of 26 and 53 years. Age is a factor that may enhance the adoption of innovation and as reported by Nwaiwu *et al.*, (2012) age is a determinant of human reasoning, decision making and responsibility. Younger and middle aged individuals are known to be active and innovative (Adeoye *et al.*, 2011). They are also expected to effectively utilize available resources (Nwaiwu *et al.*, 2012). The result also indicated that, the pastoralist farmers are still agile and strong to undertake and provide effective labour force required for the pastoral milk production.

Household size refers to the group of persons staying in the same compound and eating from the same pot including other dependents that may be outside. According to the National Population Commission (NPC, 2006), these individuals think of themselves as a unit. The result in Table 1 reveals that, 47.37% of the pastoralist farmers had household sizes ranging between 6 and 10 people. However, the household size of between of more than 20 persons was evident constituting about 5.26%. Availability of labor in undertaking economic activities is largely dependent on the size of the household (Katanga *et al.*; 2019). Large family size have been established among sesame farmers, this implies labor availability for pastoral activities and that the larger the household size the more the family labor and the lesser the cost of hired labor in the agricultural production, this is in conformity with the position of Musa (2003) who reported that, the higher the household size the more the family labor and the less the cost of hired labor in production and marketing activities.

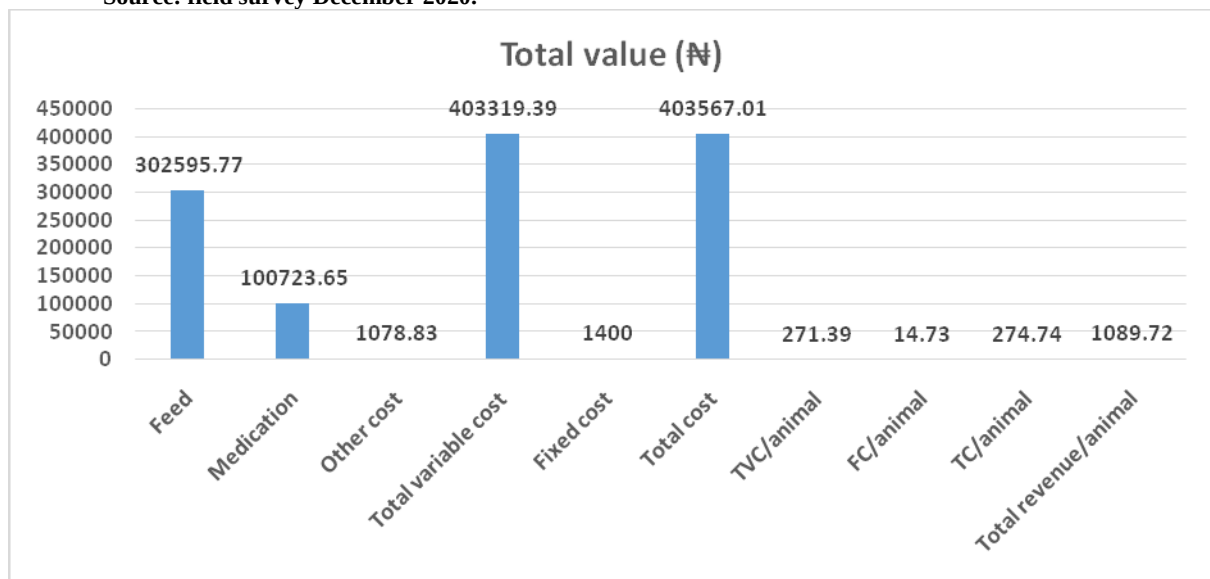
Educational status of the respondents is very important toward the strength or weakness in the managerial capability and adoption of innovation (Ayoola, 2010). The educational status of the pastoral farmers in Table 1 shows that, 92.63 % of the pastoral farmers had Qur'anic education, 3.16% received primary while 4.21% have neither received Quranic nor western education. Education helps the farmer to easily understand and apply new practices and techniques in the production processes.

This refers to the number of heads of cattle own in a herd by a pastoralist. The pastoralist were categorized in to small, medium or large scale based on the size of their herd. The result in Table 1 shows that, majority of the herders (52.63%) owned 30 heads and below. sizeable (31.58%) were owned between 40 and 89 heads of cattle. Only 7.37% owned between 150 and above cattle heads. The results indicated that majority of the traditional milk production comes from small to medium pastoralist which are the commonest form of Nigerian's agro-pastoral system found nthe country as earlier reported by Musa (2003) that, small and medium scale farm holding account for about 95% of the total agricultural output in Nigeria. The implication of this finding is that, achievement of the sustainable development goals in terms of food self sufficiency and promotion of non oil export would be difficult.

Table 2: Cost and returns components of traditional milk production per month

Cost components	Cost (₦)/head	Total value (₦)
Feed	3185.2	302595.77
Medication	1060.24	100723.65
Other cost	11.35	1078.83
Total variable cost	4245.96	403319.39
Fixed cost	14.73	1400
Total cost	4248.07	403567.01
TVC/animal	2.85	271.39
FC/animal	0.155	14.73
TC/animal	2.89	274.74
Total revenue/animal	11.47	1089.72

Source: field survey December 2020.



Surveys are the most common data collection vehicle used by countries with existing Cost of production (CoP) programmes (FAO 2010). The main reason for this is that most of the information on CoP is better known by the farmers themselves. In addition, many countries have a long experience in undertaking agricultural surveys in areas such as production and revenue measurement. These information sources and experiences in surveys are leveraged to expand the data collection to areas such as cost of production.

Cost and return of Traditional Milk production for three (3) months

In production, cost could either be fixed or variable. Fixed cost is related to input that do not change with level of production (output) in a short run period, while the variable costs are those that change as the output change. Fixed cost in the traditional milk production includes the depreciation on ropes, milking containers and housing, whereas the variable cost includes cost of feed, labour, medication and others (marketing, tax, etc.). The result in Table 3 reveals that, feed cost constitutes 74.89% of the total cost, while the medication and other cost accounted for 24.95% and 0.61% respectively.

The result further reveals a gross margin of ₦818.33 per cow for three month and net farm income of ₦814.98. Similarly, a gross ratio of 0.25, operating ratio of 0.98 and fixed ratio 0.253 were recorded, all these indices shows that, traditional milk production was profitable in the area. Additionally, return per Naira invested was ₦3.96k implying that for each Naira invested a profit of ₦3.96k was returned hence a rate of returns of 396%.

Table 3: Profitability Indices of Traditional Milk Production per Cow per Month

Profitability components	Value (₦) or ratio
GM (GI-TVC)	818.33
NFI (GI-TC)	814.98
OR (TVC/TC)	0.98
FR (TC/GI)	0.25
GR (TC/GI)	0.25
GM/(TVC)	4.01
Return/naira (NFI/TC)	3.96
Rate of return	396%
GM/TFC	73.94

Source: field survey, December 2020.

CONCLUSION AND RECOMMENDATIONS

From the findings of the study, It can be concluded that, milk production under pastoralist is profitable especially with large herd size and younger lactating cows, despite the challenges of access to quality feeds, inadequate grazing land and efficient veterinary and extension services.

The empowerment of traditional milk production under pastoralist could best be achieved through;

- Improving feed supply by establishing more pastoral grazing land, and rehabilitation of the existing ones with a network of cattle routes
- Encouraging the cross-breeding of the local breed with exotic for improvement.
- Provision of earth dams and water drinking sites and rehabilitation of the existing ones
- Provision of accessible and affordable veterinary extension services and drugs
- Legislation against grazing reserves , cattle route and drinking points encroachment

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DOES CAPITAL MARKET INFLUENCES ECONOMIC GROWTH IN AFRICA? EVIDENCE FROM PANEL DATA

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Abstract:

This research analyzes the impact of capital market on economic growth of Nigeria, Ghana, Kenya and South Africa using time series data from 1980 to 2014. The methodology used is panel estimation comprise of pooled ordinary least square (OLS), fixed effect and random effect techniques. Diagnostics test were also applied. The result from the pooled OLS reveals that countries have common market structure. The result of the fixed effect and random effect models confirms the existence of static interdependencies among countries which suggest the evidence of spillover effect among the countries. It also constructed three dummies aimed to account for country specific effect, the findings reveals that there is evidence of country specific effect for the period under study. However, the result of the Hausman test confirms that the null hypothesis of the random effect model cannot be rejected and suggest that the appropriate model to be used is the random effect model. Finally, we conclude that, the nature of capital markets and the pattern of economic activities in Africa revealed the reasons why the market is performing below expectation. Therefore, government and regulatory agencies should promote a sound Africa stock market integration by creating a platform that will engender best corporate practice, market information which will result in growing investment, increased confidence in the financial system among African countries.

Keywords: Capital market, Panel Data, Spillover Effect, Economic Growth, African Countries

INTRODUCTION

Capital Market plays an important role in determining the condition of growth in an economy. Similarly, the market has been identified as an institution that contributes to the socio-economic growth and development of emerging and developed economies. This is made possible through some vital roles played, such as channeling resources, promoting reforms to modernize the financial sectors, financial intermediation capacity to link deficit to surplus sector of the economy, and a veritable tool in the mobilization and allocation of savings among competitive uses which are critical to the growth and efficiency of the economy (Pat and James, 2010). Ultimately, the relationship between capital market and economic growth is a central concern and a specific issue to both economist and policy makers (Schumpeter, 1912). Thus, the capital market comprises the complex of institutions and mechanisms through which medium term funds and long term funds are pooled and made available to individual business and governments Jhingan (2004). Similarly, the market influences economic growth through encouraging savings among individuals and providing avenues for firm financing (Charles & Charles, 2007).

Experience from the recent global financial crisis has shown that an economy with a weak monetary institution is bound to collapse as such, numerous effort and policies are being put in place by the government and monetary authorities to improve the Financial System of some African countries, yet the level of Financial Intermediation is still weak in these countries. This is a serious impediment towards attaining high level of growth, development and productivity. More so, contribution to the literature on the impact of Capital and Economic Growth on African Countries Nexus are numerous but more effort is still needed using panel data econometric analysis to evaluate the performance of capital market in relation to economic growth in Nigeria, Ghana, Kenya and South Africa. The research study among other things will also examine the nature of cross section dependence among the countries under studies and further determine the nature of heterogeneous relationship among the variables used in the model.

EMPIRICAL REVIEW

A number of research and studies have been carried out on the impact of capital market and economic growth on African countries. However, some of the notable empirical literatures which are considered relevant to this research study are closely examined below. Kofi (1998) assess the factors affecting the delivery and settlement of transactions are performed satisfactorily by brokers and further establishes that the entry into and exist from the Ghana stock market are without any significant restriction. The study further recommends a campaign to educate the Ghanaian public about the activities of the Ghana stock exchange and to promote investment in general and further advice the government on the need to give fiscal incentives in the form of taxation in favor of listed companies and pursue prudent macroeconomic policies, particularly in the area of inflation management. Demetriades, et al (2001) utilized time series data from five developed countries, to examine the relationship between stock market and economic growth, controlling for other effect of the banking system and stock market and economic growth, controlling for other effect of the banking system and stock market volatility. Their result supports the view that, although banks and stock market may promote economic growth, the effect of banks is more. They further elucidate that the contribution of stock market to economic growth may have been exaggerated by studies that uses cross country regressions.

Analyzing the development of Capital Market and growth of Sub-Saharan Africa a case study of Ghana is the work of Ziorklui (2001), the study identifies constraints of capital market development in Ghana and looks at how recent policy changes impact market development, growth and poverty alleviation. The study is an integration of an analytical framework with a synthesis of secondary financial and primary data collected through field survey questionnaires and interviews. Descriptive statistical test and econometric analysis was employed to stylized facts of capital market in Ghana. His findings revealed that financial sector reform has addressed some major constraint towards the development of the capital market in Ghana. Thus suggested that it is crucial create a viable macroeconomic environment for capital market development through Deficit reduction and balanced budget strategy.

In a study, Geneva (2002) elucidates “Promoting growth in African Capital Markets by implementing, the New Partnership for African Development (NEPAD) programme”. NEPAD is a new approach of partnership with the rest of the world based on a promise by African nations to be of collective good behavior, domestically, economically and politically. The success of NEPAD is also based on its being owned and led by Africans. Mohtadi and Agarwal (2004) examined the Capital Market and Economic Growth in developing countries using a panel data for 21 emerging markets for a period of 21 years (1977 - 1997), their findings revealed that turnover ratio is an important and statistically insignificant determinant of investment by firms and that this investment in turn are significant determinant of aggregate growth. Foreign direct investment is also found to have a strong positive influence on aggregate growth. The result of their study indicates that both turnover ratio and market capitalization are important variables as determinants of economic growth.

in addition, Juan et al (2008) scrutinize how growth and quality of capital market drive foreign capital: The case of cross-border mergers and acquisitions from leading emerging Economies from 1987-2006. Findings revealed that stock market variables, via Capitalization and Value Addition encourage the number of deals and value of cross border mergers and acquisition and suggested that higher reforms in capital market could increase firm level of direct investment. In the same vain MD Wadud (2009) made an in-depth study in the South Asian countries being a developing continent like Africa on financial development and economic growth carefully relating the long-run causal relationship between financial development and economic growth for the South Asian countries of India, Pakistan and Bangladesh for a period between (1976 - 2008), stating that financial development emanates from financial systems that encourage financial stability applying the cointegrated vector autoregressive model to establish a long-run relationship between financial development and economic growth. The findings explain a stable relationship between financial development and economic growth for these countries furthermore results of error correction models indicate Granger causality between financial

developments to economic growth. Aboudou (2010) observed that stock market is an indicator of an economy financial health, while examining stock market development and economic growth in the period (1995-2006) via the time series econometric investigation attempting to analyze both the short-run and long-run relationship by constructing an error correction model applying the major stock market indicators namely size and liquidity, finding explains that stock market development positively affect economic growth in West African monetary union both in the short-run and long-run.

More so, Samuel (2011) examined the challenges to the growth of capital markets in underdeveloped economies between (2003-2007) despite the universal recognition that stock exchanges are the most pragmatic and cost effective method of raising capital especially to private sectors, firm in developing and under developing economies have consistently stunned the stock exchange hence most of the IPDs that have occurred on the exchanges in underdeveloped markets have been state driven rather than market driven. Applying expert interviews of key informants, to develop a conceptual model for examining the various factors for the private sectors failure to adequately use the stock market as a financing market, subsequently for firms to go IPO or to operate to a higher global business standard there is a need for legislation obligating firms of a given size to file financial statements with a designated body. This requirement is now standard in several emerging market jurisdictions such as Taiwan Limitations to these research according to Samuel (2011) is the paucity of data in which private firms are not obliged to disclose to the public their operating results and financial positions.

Jonathan (2011) relate the determinants of venture capital in Africa, applying a cross-sectional data set covering (36) African countries in a semi-logarithmic model. The study finds that the rule of law, R & D expenditure as a percentage of GDP and better information between investors and potential investees are positively and significantly related to ventures capital activity in Africa. Furthermore, it also finds that capital gains tax rates are negatively and significantly related to venture capital activity, on the continent, employing the Ordinary Least Square (OLS) method. Also, the findings indicate that institutional environment affecting financial factors and regulatory factors attempts to explain venture capital activities in Africa, stating that if private sector development actors wish to increase the potency of the venture capital instrument in a missing middle reduction toolkit, they should focus on these factors to stimulate venture capital activity on the continent. However, Collins (2012) attempts to empirically ascertain whether African Stock Markets can improve its information efficiency, employing parametric and non-parametric variance ratios tests on 8 African continent-wide spanning from (1995 - 2011). Findings revealed that formal harmonization and integration of African Stock Markets may improve their informational efficiency. Furthermore, examining the role of capital market in emerging Economy is a study by Isenmila and Akinola (2012), the study reveals that a peculiar experience in most African economies is that the challenges with good quality institutions such as democratic accountability could have resulted to the weak capital market development in Africa because they increase political risk and reduce the viability of external finance. Collins (2012) noted that, despite experiencing rapid growth in their number and size, facts shows that African Stock Market remains highly fragmented, small, illiquid and technologically weak, thus affecting its efficiency.

More so, Okechukwu (2013) studied the trends in stock market on sub-Saharan countries from 1991-2009. His study was on six selected countries of sub-Saharan Africa. The applied panel data analysis and his findings reveals that private capital stock market development measured by market capitalization, stock turnover ratio and foreign direct investment have positive significant correlation with growth in per capita output on sub-Saharan Africa. His study further recommends that foreign direct investment and development of equity market in sub-Saharan Africa should be encouraged through trade and market liberalization. Likewise, Ifuero and Abudu (2013), Examine stock market and economic growth in Ghana, Kenya and Nigeria. The study further explains the causal relationship and the direction of causality between stock market development and economic growth spanning from (1989-2009). The empirical findings of the study shows that there is no causal relationship between stock market development and economic growth in Ghana and Nigeria, but however revealed a bidirectional causal relationship between stock market development and economic growth in Kenya. The study further recommend that policy makers and regulatory bodies should formulate and implement policies that will attract investors and avail the real sector of the economy the much needed fund for the production and encourage listing of companies that contribute largely to GDP in the nation stock exchange.

Kapingura and Makhetha (2013) evaluate the causal relationship between the bond market development and economic growth in African between (1995 -2012) applying the Engle Granger cointegration method and the pairwise granger causality test was likewise used. Empirical results of their finding reveals that their exist significant relationship between economic activities and bond market capitalization, implying that the African government should put in place policies which will promote the development of the bond market as one of the ways to mobilize resources and promote economic growth.

In a study of the Asian economy as an emerging economy Christopher Gan et al(2013) Views the cross-sectional analysis of stock returns on the Chinese A-share stock market between (1996-2005) applying the Fama-french three-factor model (1993) and CAPM, their findings revealed a positive relationship between book-to-market ratio and stock excess returns and negative relationship between size and stock excess returns. Further implying that the fama-french three factor model is more accurate in predicting stock excess returns than the CAPM the size effect is stronger than that of the Book-to-Market ratio (BTM), the results also suggest that stock profitability is related to size and BTM ratios in China's Stock Market.

Furthermore, Forgat (2013) look at the finance and economic growth nexus: complementarities and substitutability between the banking sector and financial markets in Africa, using South Africa as a case study and employed the time series analysis using the VAR model. His findings revealed that financial intermediaries and financial market have different impacts on economic growth given their different roles in the economy. This implies that their bidirectional causality between stock market and economic growth and therefore recommends that financial market development should be encourages through appropriate mix of taxes, legal and regulatory policies to remove barriers to financial market operations and thus enhance their efficiency. Abidemi and Nosakhham (2013) view financial openness and capital market development for some selected West African countries from 1988 – 2010 and adopted the panel regression technique, their findings revealed that higher financial openness in the sub-region would enhance the development of domestic capital market. However, the pattern of foreign capital inflow to a country as well as the structure of external assets and liabilities appears to play a role in explaining the impact of financial openness on domestic capital markets within the West African sub-region and thus recommend the need for emerging countries, especially in the West African sub-region to be more selective in terms of inflow of foreign capital into the capital markets. Financial development and economic growth is a study put forward by MD in addition, Bayemi et al (2013) Empirical Relationship between the stock markets and macroeconomic variable evidence from African Stock Markets from (1988 - 2011) and employed a panel residual based test of pedroni and error correction based test of wasteland, their findings revealed that in the long-run, foreign direct investment and external debt exert a positive impact on the African Stock Market while negative impact will be recorded for money supply.

Moreover, Masafumi (2013) capital market integration: progress ahead of the East African community monetary Union. The study confirms that member countries have made noticeable progress in developing domestic capital markets through a regional approach, removing constraints on capital transactions and harmonizing market infrastructure. Policy option recommends the need to harmonize market infrastructure, strengthen regional surveillance mechanism and encourage local currency bond issuance by multilateral financial institutions. In addition, Daniel (2014) stock market integration in West African Monetary Zone and applied a Linear and Non-Linear Cointegration approach. The result from the linear cointegration indicates that the only active stock markets (Ghana Stock Exchange and Nigerian Stock Exchange) in the region are not integrated. However, the linear method shaved a bleak sign of integration. Also, a fractional integration method showed that Ghana Stock Exchange has infinite stock duration, the Nigerian Stock Exchange is long-lived, as such the markets are more of segmented than integrated and hence suggest that the countries work towards harmonizing the Capital market through cross listing and adopting common capital market policies. However, Jalloh (2015) examines how stock market capitalization influences economic growth in Africa. The study employs a dynamic panel estimation approach with a view to assessing the relative impact of stock market capitalization on economic growth in Africa. The result from the study revealed that raising stock market capitalization by a marginal average of 10% induces growth on average by 5.4% in countries studied. Therefore, the positive and significant relationship between stock market capitalization and economic growth as found in this study provides encouraging signals for African countries to explore stock markets as a potential avenue for expediting economic growth. There is therefore a dire need for policy makers in Africa to direct attention towards the implementation of policy measures that will encourage the development of stock market with a view to promoting economic growth. The effect of macro-economic variables on stock returns in the east Africa via Kenya, Uganda and Nigeria is put forward by Kaunyangi and Tabitha (2015) panel data regression analysis and descriptive analysis were applied in the study. Their findings reveal that macroeconomic variables are contributing significantly on stock returns in East Africa. The study recommends that policy makers in east Africa should make effort towards improving the macroeconomic condition of the region to improve stock returns.

Based on the empirical studies analyzed in the course of this research work on African countries, it was observed by some scholars that capital market has positive impact on economic growth while other scholars are of the view that the market has no impact on economic growth. Therefore, this study is aimed at contributing to this debate through panel data econometric analysis, pooled OLS, fixed effect, random effect model and Hausman test on Nigeria, Ghana, Kenya and South Africa.

METHODOLOGY

This paper employs secondary data basically cross sectional and time series data ranging from 1980-2014. The relevant data were sourced from Central Bank statistical bulletin of relevant countries, world federation exchange data base and data bank group database on the following variables; Real Gross Domestic Product (RGDP), Stock market capitalization (SMC), Stock turnover ratio (STR), Value of traded stock (VTS), Number of listed stock (NLS). The African capital Market of the following Countries are included in the Paper Nigeria, Ghana, Kenya and South Africa. However, the choice of selecting these countries are based on availability data and nature of economic activities involved in the country thus, studying their financial market will us make generalization on other African countries. The technique of analysis employed in this paper is Panel econometric analysis. Also, fixed effect model, Random effect model and pooled ordinary least square model will be relied upon to analyze the data collected. Panel econometric analysis plays a vital role when it becomes necessary to examine the nature of cross section dependence among the countries under studies and to determine the nature of heterogeneous relationship among the variables used in the model.

Model Specification and Estimation Procedure

The functional model is specified as:

$$RGDP_{it} = f(SMC_{it} TVL_{it} STR_{it} NLC_{it} \omega t_{it}) \dots \dots \dots (1)$$

Where

RGDP= Gross Domestic Product

SMC = Stock Market Capitalization

STR= Stock Turnover Ratio

TVL =Value of Traded Stock

NLC =Number of Listed Securities

Wt = Country-specific effect at time t

$\alpha_0 \dots \alpha_6$ = Parameters

t=Current period

i=individual observation

e=Error term in the model

The Model will be estimated in the context of panel data. Thus, the study will use the fixed effect model (FE), Random effect model (RE), and the pooled Ordinary least Square model. In a panel data set, a given sample of N individuals is observed at different time periods and thus provides multiple observations on each individual in the sample.

$$y = \alpha + x\beta + \mu \dots \dots \dots (2)$$

Where y explain log of gross domestic product and x is a vector of determinant of capital market growth. Furthermore, assume that there are data for individuals at time periods. However, if it is constant for all cross-section units, then the data set is called a balanced panel. Otherwise the panel is unbalanced.

Specification of Fixed and Random Effects Regression Models

Assume we have an economic relationship that involves a dependent variable, Y , two observable explanatory variables x_1 and x_2 and one or more unobservable confounding variables. We have panel data for Y , x_1 and x_2 . the panel data consists of N -units and T -time periods, and therefore we have N times T observations. The classical linear regression model without the intercept is;

$$\gamma_{it} = \beta_1 x_{it1} + \beta_2 x_{it2} + \mu_{it} \dots \dots \dots (3)$$

For $i = 1, 2, \dots \dots \dots, N$ and $t = 1, 2, \dots \dots \dots, T$

Where γ_{it} is the value of Y for the ith unit for the tth time period; x_{it1} is the value of x_1 for the ith unit for the tth time period, x_{it2} is the value of x_2 for the ith unit for the tth time period, and μ_{it} is the error for the ith unit for the tth time period. The fixed effects regression model, which is an extension of the classical linear regression model is;

$$\gamma_{it} = \beta_1 x_{it1} + \beta_2 x_{it2} + V_i + s_{it} \dots \dots \dots (4)$$

Where $\mu_{it} = V_i + s_{it}$ we have decomposed the error term for the classical linear regression model into two components. The component v_i represents all unobserved factors that vary across units but are constant over time. The component s_{it} represents all unobserved factors that vary across units and time. We assume that the net effect on y of unobservable factors for the ith unit that are constant over time is a fixed parameter, designated a_1 . Therefore, we can rewrite the fixed effects model as

$$\gamma_{it} = \beta_1 x_{it1} + \beta_2 x_{it2} + a_1 + a_2 + \dots + a_n + s_{it} \dots \dots \dots (5)$$

We have replaced the unobserved error component V_i with a set of fixed parameters, $a_1 + a_2 + \dots + a_n$ one for each of the N units in the sample. For example, a_1 represents the net effect on y of unobservable factors that are constant over time for unit one. These N fixed parameters control for the net effects of all unobservable factors that differ across units but are constant over time. Intuitively, we are using each unit as a control for itself. This

is because variation in y over time cannot be explained by factors that vary across units, but don't vary over time.

Estimation

Two estimators can be used to estimate the parameters of the fixed effects regression model. 1) Least squares dummy variable estimator. 2) Fixed effects estimator. The least squares dummy variable estimator involves two steps. In step 1, we create a dummy variable for each of the N units in the study. These N dummy variables are defined as follows.

$$DK_{it} = 0 \text{ If } K \neq i$$

$$DK_{it} = 1 \text{ If } K = i$$

In step 2, we run a regression of the dependent variable on the N dummy variables and the explanatory variables, x_1 and x_2 using the OLS estimator. That is we estimate the following linear regression model using the OLS estimator.

$$y_{it} = \beta_1 x_{it1} + \beta_2 x_{it2} + a_1 D_{1it} + a_2 D_{2it} + \dots + a_n D_{nit} + s_{it} \dots \dots \dots (6)$$

We obtain estimates of the N fixed effects constant parameters and the two slope parameter. The estimate of the constants and slope parameters are unbiased in small samples. The estimates of the slope parameters are consistent in large samples with a fixed T as $N \rightarrow \infty$. However, the estimates of the constant parameters are not consistent, with a fixed T as $N \rightarrow \infty$. This is because as we add each additional unit we add a new parameter. In general, the larger the T , the better the estimate of the constant parameter, because of this, when T is small many researchers views of the intercept parameters as controls, and ignore the actual estimates.

RESULTS AND DISCUSSIONS

Findings from the pooled OLS showed that the parameters of the model confirm to the apriori expectation and the explanatory variable is best explained by the dependent variables. The R^2 is approximately 60% which explains the joint significance in explaining the explanatory variables which are captured by GDP while 40% explains other factors not captured in the model. In addition, the coefficient measures the unit change in growth associated with a unit change in the parameters that indicate stock market capitalization, stock market turnover ratio, value of traded stock, number of listed securities and gross domestic product. However, stock market capitalization, value of traded stock and number of listed securities were found to be statistically insignificant while turnover ratio is found to be statistically significant this implies that countries under study have common capital market structure that may be similar within each country. However, This finding is similar with the study of Ifuero and Abudu (2013) and Echokoba et al (2013) Furthermore, when all the variables in the model are held constant, there will be a positive variation to a tune of 2.15 units in GDP. A unit change in stock market capitalization will lead to an increase in GDP by 0.17 which is statistically insignificant. However, a unit change in stock market turnover ratio will lead to an increase in GDP by 2.51 which is statistically significant. Also, a unit change in value of traded stock will lead to an increase in GDP by 0.03 which is statistically insignificant and a unit change in number of listed securities will lead to an increase in GDP to a tune of 8.73 units which is statistically insignificant. Therefore, the result from these findings indicates that all the countries under study have common capital market structure that may be similar within each country. Thus, countries exhibit somewhat similar pattern of stock market.

More so, the result of the fixed effect and random effect model where country specific effect is considered confirms the existence of static interdependencies among countries which suggest the evidence of spill over transmission of capital market among African countries under study. Also, the use of Hausman test was to determine which among the random effect and the fixed effect is the right one for use in the course of this study. Therefore, in this study the null hypothesis of the random effect model cannot be rejected and implies that the appropriate model to be used in modeling the impact of capital market on economic growth on selected African countries is the random effect model. This finding is similar with the study of Kaunyangi and Tabitha (2015) who examined the effect of macroeconomic variables on stock returns in east African community stock exchange market. Though, their study link macroeconomic variable with stock returns on east Africa but however revealed that the appropriate model to be used in modelling the macroeconomic variables on stock returns in east Africa is the random effect model. This paper further estimated fixed effect dummy variables regression model in table 4.8 (see appendix) the study introduces three dummies (d_2 d_3 d_4) the dummies constructed are aimed to account for country specific effects in the relationship as there exist differences in the nature and pattern of market in each country. Also, introducing these dummies will enable us account for other variables that are not captured in model. Therefore, imposing the dummies in the model enables us estimate the average effect of the parameters in the model. Going by the result from this findings it can asserted that since the coefficient of dummy variable d_2 is -3.15 it implies that Ghana is 3.15 lower than Nigeria in terms of growth rate in gross domestic product. Similarly, coefficient of dummy variable d_3 is -4.06 which implies that Kenya is 4.06 times lower than Nigeria in terms of growth rate in gross domestic product and coefficient of dummy

variables d_4 is -1.83 which implies that South Africa is -1.83 times lower than Nigeria in terms of growth rate in gross domestic product. In order to make an outstanding comparison, the study utilized the Breush-Pagan test for random versus OLS in table 4.10 (see appendix). The use of this test was to make a comparison between the random effect and the OLS model. The probability values were found to be more than 0.05. Hence we cannot reject the null hypothesis and conclude that the random effect model is more appropriate than the OLS. This finding is consistent with the findings from the Hausman test in the previous paragraph which suggests that the appropriate model, in modeling the impact of capital market on economic growth in Africa is the random effect model.

CONCLUSION AND POLICY RECOMMENDATIONS

The study examined the economic impact of capital market and economic growth of Nigeria, Ghana, Kenya and South Africa. Panel estimation revealed a weak relationship between capital market and economic growth in Africa. Combined data of the capital market of the four countries do not have significant effect on the combined economy. Hence, it is observed that capital market in Africa generally have not contributed significantly to growth and development of African countries. Therefore, the nature of capital markets and the pattern of economic activities in Africa revealed the reasons why the market is performing below expectations as the market has suffered from numerous factors such as low level of public awareness and participation, failure of corporate governance, market failure and policy inconsistencies are the factors that account why the market is contributing insignificantly to GDP among African countries. Therefore, the economic draw of this market and its negative contribution to GDP is hampered by many factors which if not properly addressed squarely the market may likely collapse completely.

Based on the aforementioned, there is need for government and regulatory agencies to promote a sound Africa stock market integration by creating a platform that will engender best corporate practice, market information which will result in growing investment, increased confidence in the financial system among African countries. Likewise, government and regulatory agencies should ensure relative stability in the banks-based financial sector and market based stock market of the economy to foster capital formation, increased investment and ensure stability in the financial system.



EFFECT OF FINANCIAL DEVELOPMENT ON ENVIRONMENTAL QUALITY: EVIDENCE FROM NIGERIA

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Abstract

The role of environmental quality on sustainable growth and development of any economy cannot be overemphasized. The paper examined the impact of financial development on environmental quality in Nigeria from 1981 to 2018. The autoregressive distributed lag method was used to examine the level relationship (long run) and found a long-run relationship among the variables. Financial development, population growth, economic growth and energy usage positively contributes to environmental degradation in the short and long runs in Nigeria. We found environmental population Kuznets curve (EPKC) hold in Nigeria while the environmental carbon Kuznets curve (ECKC) does not hold in Nigeria. Financial development, economic growth, energy usage, and population growth have a casual effect on carbon dioxide emission (CO₂) in the short run. The result emphasizes the need to channel financial resources toward clean energy projects and adopt new technology to improve carbon footprint to improve environmental quality. The government should take the lead in adopting renewable energy technology and decommissioning nonrenewable technology aggressively in Nigeria.

Keyword: Financial development, Environmental Quality, CO₂ emission, ARDL Method, Nigeria Economy.

INTRODUCTION

Environmental degradation has assumed a dangerous proportion; this has heightened concern by the proponent of sustainable development in recent time. This socioeconomic menace has drawn the attention of researcher and policymakers in both developed and developing economies. Increased attention is devoted to the problem of carbon dioxide emission in a developed country in recent times. The search for factors responsible for continuous increase in carbon dioxide emission is endless, and studies aimed at providing answers have produced mixed results. Human activities such as productions, consumptions, transportation and urbanization etc, are regarded as primary determinants of carbon dioxide emission. Financial development is associated with environmental quality. Zhang (2011) financial development influence environmental quality via three channels: First, stock market development assist listed companies to lower financing costs, increase financing channels, diversified risk and optimize asset/liability structure, this enable them to buy new installations and invest in new projects and consequently increase energy consumption and carbon emissions. Second, financial development might attract foreign direct investment, which enhances economic growth and exacerbate carbon emissions. Third, effective and efficient financial intermediation is favourable to consumers' loan activities, making it easier for consumers to buy expensive items such as luxury houses, air conditioners, automobiles, refrigerators, washing machines etc. Hence increase their carbon-dioxide emission footprint (Zhang, 2011). A well-developed financial sector could also aid in adopted energy-saving method of production and environmentally-friendly

consumer products. The financial sector plays a significant role in the economic development of both developing and developed countries. Efficient management of the financial system allows countries to use financial resources productively, even with limited financial resources; this creates a socio-economic environment that is more favourable for the progress of innovation and stimulates economic development (Furuoka, 2015a). A well developed and managed financial system attracts investors, boosts the stock market, and improves the efficiency of economic activities. Financial development is an integral part of every economy. It is promoting the stock market and banking activities in the economy. The financial sector attracts foreign direct investment, which in-turns aids in the financial system by improving economic efficiency. There is a strong correlation between the financial system and economic activities (Sadorsky, 2011).

There are two streams of views concerning the effects of financial development on environmental quality. One view holds that an efficient financial intermediation increase opportunities for investment increased lending to firms and households; it will encourage firms and consumers to invest in the new financial project and purchase high earned consumable items, thereby raising energy consumption (such as refrigerator, Air conditioner, Television, automobiles and machinery etc.). The growing energy consumption, in turn, increased Carbon dioxide emissions into the atmosphere and organic pollutants into the earth Ecosystem (Zhang, 2011; Boutabba, 2014; Abbasi & Riaz, 2016; Shahbaz et al., 2016c; Bekhet et al. 2017).

On the contrary, developed financial institutions and capital markets provide the opportunity for investable funds to the renewable energy sector and loan and equity financing in funding green renewable energy projects, respectively (Dasgupta, Hong, Laplante, & Mamingi, 2004). A well developed financial system provides an avenue to offer credits for environmentally friendly projects at low financing costs. Besides, FDI may lead to technological innovation by local firms, which can help reduce energy usage (Alfaro, Chanda, Kalemli-Ozcan, & Sayek, 2006; 2004, Hermes & Lensink, 2003; Bailliu, 2000; Jalil & Feridun, 2011, Tamazian et al., 2009; Claessens & Feijen, 2007). Therefore, financial development might be an incentive for increased energy substitution (which reduces energy consumption and CO₂ emission). The results or outcomes of research on financial development-environment quality nexus are ambiguous at best. Research on financial development-environmental quality is limited in Nigeria to the best of our knowledge, and the econometric approach employed is fraught with the defect.

The paper is structured as follows: following the introduction is section II, a literature review on financial development and environmental quality; Section III concerned itself with its methodology. Section IV deals with empirical analysis and discussion of results, while section V concludes and recommendations are provided.

LITERATURE REVIEW

Numerous studies have examined the relationship between financial development and CO₂ emission with diverse outcomes; this includes but not limited to Islam et al. (2013) affirmed both long and short-run relationships between financial development and CO₂ emissions in Malaysia. Boutabba (2014) found that financial development aggravates CO₂ emissions in India. In the same vein, Abbasi and Riaz (2016) found that financial development is the main contributor to CO₂ emissions in small and emerging economies. Shahbaz et al. (2016c) found that financial development is detrimental to environmental quality in Pakistan. Bekhet et al. (2017) established that financial development is liable for raising CO₂ emissions in Gulf Cooperation Council (GCC) countries except for United Arab Emirates (UAE). Kahouli (2017) established a unidirectional causal relationship between financial development and CO₂ emissions in South Mediterranean economies (SMEs). Also, Khan et al. (2017a) found that financial development reduces CO₂ emissions in Pakistan and Bangladesh but accentuated in India. Tamazian et al. (2009) examined the relationship between economic growth, financial development and climate quality for BRIC countries. It was found that financial development helps new technologies emerges to boost energy efficiency and carbon emission concentration to decrease. Frankel and Romer (1999) opined that developed financial markets enhance foreign direct investment inflows and stimulate green energy technology adoption. Financial development serves as a channel for cutting edge environmentally-friendly technology (Birdsall & Wheeler, 1993; Frankel & Rose, 2002). Some studies show that financial development inversely impacts energy consumption and thus CO₂ emissions (Tamazian et al., 2009). Furthermore, a developed financial sector may bring down the cost of borrowing, promote investment in the clean energy sub-sector, and diminish CO₂ emissions (Tamazian et al., 2009; Tamazian & Rao, 2010; Shahbaz, 2009; Shahbaz et al., 2010a, 2010b). Yuxiang & Chen (2010) posit that financial development policies encourage progress (advanced technology), cut CO₂ emissions and promote domestic production. Al-mulali and Sab (2012) state that economic growth and increase in energy consumption will increase aggregate demand, which will, in turn, lead to increase demand for financial services, which could result in the financial sector setting up sound financial policies to control the amount of CO₂ emissions. Also, Frankel and Romer (1999) stated that financial development in developing countries will be more motivated to adopt new energy

Technologies, which is a move to reduce the environmental effects caused by developing countries. Cole and Elliot (2005) posit that financial development allows medium or large businesses to grow and generate economies of scale through the effects of this growth, thereby reducing the use of resources and CO₂ emission. Zhang (2011) opines that financial development will lead to financial inefficiency, which causes CO₂ emissions to rise. Cole and Elliot (2005) corroborated the inefficiency view and pointed out that small-scale enterprises are likely to increase their size through financial development assistance and raise carbon emissions. Haseeb et al. (2018) examined the effect of energy consumption and financial development for BRICS countries. They found that energy consumption and financial developments are the main contributors to carbon dioxide emissions and that the EKC hypothesis holds in BRICS economies. Siddique (2017) examined the impact of financial development and energy consumption on CO₂ emission for Pakistan for the period of 1980 to 2015. He found the energy consumption and financial development increased carbon dioxide emissions in Pakistan. Energy consumption and financial development enhance production level and economic growth but also increase carbon dioxide emissions (Siddique et al., 2016). However, studies that found financial development could play a positive role in curbing CO₂ emission; Khan et al. (2017b) found bidirectional causality between financial development and CO₂ emissions in Asia. Riti et al. (2017) also reaffirmed the role of financial development in reducing CO₂ emissions in 90 countries. A financially developed country makes it easier to adopt advanced technology in the energy sector, which helps reduce CO₂ emissions significantly, that investment in technology improves efficiency in the energy sector (Kumbaroglu et al., 2008). Tadesse (2005) found that financial development enhances technological progress, which is a main determinant of productivity. Shahbaz et al. (2010b) posit that financial development stimulates investment by risk-sharing. Lanoie et al. (1998) stated that the financial market could help curb CO₂ emissions by incentivizing firms' compliance with the environmental standard. Dasgupta et al. (2004) showed that South Korean firms lose market value if they appear on the violating environmental list. Tamazian et al. (2009) also showed that economic and financial development negatively impact CO₂ emissions for BRIC nations, the United States and Japan; both factors help reduce CO₂ emissions. They also noted that financial sector reforms and trade liberalization help reduce CO₂ emissions. Tamazian and Rao (2010) employed the GMM approach to finding the effects of institutional, economic, and financial developments on CO₂ emissions for transitional economies. They found that these factors aid in lowering CO₂ emissions.

Yuxiang and Chen (2010) Used provincial data from China; they showed that financial development reduces industrial pollutants. They claimed that financial development induces capitalization, technology, income, and regulations that positively affect environmental quality. Jalil and Feridun (2010) examined the impact of financial development, economic growth, and energy consumption on environmental pollution in China using aggregate data over the period 1953-2006. They found that financial development reduces CO₂ emissions in China. Lee and Chen (2015) examined the relationship between CO₂ emissions and financial Development in OECD countries; they found that financial development can help E.U. countries lower their CO₂ emissions, and there is no evidence of EKC in E.U. countries. Xing et al. (2017) showed that financial development could improve carbon emissions condition in China, and this impact does not only reflect the regional difference. On the contrary, Omri et al.'s (2015) found a neutral relationship between financial development and CO₂ emissions in 12 MENA (the Middle East and North Africa) countries. Salahuddin et al. (2017) affirmed the neutral effect of financial development on CO₂ emissions in Kuwait, and Baloch et al. (2018) also reported a neutral relationship between financial instability and CO₂ emissions in Saudi Arabia.

METHODOLOGY

This paper is premised on Ang's (2007) CO₂ model and augmented with financial developments to establish cointegration relationships among CO₂ emissions, energy use, population, GDP and financial development. We employed the autoregressive distributed lag method developed by Pesaran et al. (2001). This method has numerous econometric advantages compared to another cointegration method. First, the endogeneity problem is alleviated due to appropriate lags, and parameter testing difficulties inherent in the long run are eradicated in a method such as Engle-Granger. Second, the long and short-run parameters could be estimated simultaneously. Third, all variables are assumed to be endogenous. Fourth, the econometric method assuaged the stress of establishing the order of integration among the variables and pretesting for unit roots. Whereas all other approaches required the variables in a time series regression equation are integrated of order one or at least of the same order, i.e., the variables are I(1), only ARDL or bound cointegration could be estimated irrespective of whether the underlying variables are I(0), I(1) or fractionally integrated and fifth, there is no need for lags length symmetry for the variables, in other words, each variable can take different lags depending on its relative significance in the model (Pesaran & Shin, 1999; Pesaran et al., 2001).

Model Specification

To capture the impact of financial development on environmental quality, the following empirical model is formulated thus;

$$CO_{2t} = f(ENG_t, POP_t, GDP_t, FD_t)v_t \dots\dots\dots 1$$

Equation (1) is transformed into natural logarithms to ensure uniformity in the unit of measure and allows us to interpret the estimated parameters in terms of elasticity;

$$\ln CO_{2t} = \gamma_0 + \gamma_1 \ln ENG_t + \gamma_2 \ln POP_t + \gamma_3 \ln GDP_t + \gamma_4 \ln FD_t + v_t \dots\dots\dots 2$$

Where

$\ln CO_{2t}$ is the natural log of carbon dioxide emission (a proxy for environmental quality) at time t, measured as metric tons per capita.

$\ln ENG_t$ is the natural log of fossil fuel consumption at time t, measured as the percentage of total energy consumption (kg of oil equivalent per capita)

$\ln POP_t$ is the natural log of population density at time t, measured as no of person per square kilometre.

$\ln GDP_t$ is the natural log of gross domestic product at time t, measured in 2000 constant U.S. dollars.

$\ln FD_t$ is the natural log of financial development indicator at time t, as a percentage of GDP.

V_t is error term at time t.

The expected sign from the estimated coefficient of the variables is as follows; $\gamma_1 > 0$, $\gamma_2 > 0$, $\gamma_3 > 0$ and $\gamma_4 < 0$, in other words, increase in energy usage, production, the population will increase Carbon dioxide emission, while improvement in financial development in an economy could lead to an increase or decrease in carbon dioxide emission depending on the application or the area of usage.

The error correction version of the ARDL model is specified thus;

$$\Delta \ln(CO_{2t}) = \gamma_0 + \sum_{i=1}^m \gamma_i CO_{2t-i} + \sum_{i=1}^n \beta_1 \Delta \ln ENG_{t-i} + \sum_{i=1}^n \beta_2 \Delta \ln POP_{t-i} + \sum_{i=1}^n \beta_3 \Delta \ln GDP_{t-i} + \sum_{i=1}^n \beta_4 \Delta \ln FD_{t-i} + \xi ECT_{t-1} + \varepsilon_t \quad 3$$

Bound Test

$$\Delta \ln(CO_{2t}) = \alpha_0 + \sum_{i=1}^j \beta_1 CO_{2t-i} + \sum_{i=1}^j \beta_2 \Delta \ln ENG_{t-i} + \sum_{i=1}^j \beta_3 \Delta \ln POP_{t-i} + \sum_{i=1}^j \beta_4 \Delta \ln GDP_{t-i} + \sum_{i=1}^j \beta_5 \Delta \ln FD_{t-i} + \delta_1 CO_{2t-i} + \delta_2 \ln ENG_{t-i} + \delta_3 \ln POP_{t-i} + \delta_4 \ln GDP_{t-i} + \delta_5 \ln FD_{t-i} + \varepsilon_t \dots\dots\dots 4$$

$$\Delta \ln ENG_t = \alpha_0 + \sum_{i=1}^j \beta_1 \Delta \ln ENG_{t-i} + \sum_{i=1}^j \beta_2 CO_{2t-i} + \sum_{i=1}^j \beta_3 \Delta \ln POP_{t-i} + \sum_{i=1}^j \beta_4 \Delta \ln GDP_{t-i} + \sum_{i=1}^j \beta_5 \Delta \ln FD_{t-i} + \delta_1 \Delta \ln ENG_{t-i} + \delta_2 CO_{2t-i} + \delta_3 \ln POP_{t-i} + \delta_4 \ln GDP_{t-i} + \delta_5 \ln FD_{t-i} + \varepsilon_t \dots\dots\dots 5$$

$$\Delta \ln POP_t = \alpha_0 + \sum_{i=1}^j \beta_1 \Delta \ln POP_{t-i} + \sum_{i=1}^j \beta_2 \Delta \ln ENG_{t-i} + \sum_{i=1}^j \beta_3 CO_{2t-i} + \sum_{i=1}^j \beta_4 \Delta \ln GDP_{t-i} + \sum_{i=1}^j \beta_5 \Delta \ln FD_{t-i} + \delta_1 \ln POP_{t-i} + \delta_2 \ln ENG_{t-i} + \delta_3 CO_{2t-i} + \delta_4 \ln GDP_{t-i} + \delta_5 \ln FD_{t-i} + \varepsilon_t \dots\dots\dots 6$$

$$\Delta \ln GDP_t = \alpha_0 + \sum_{i=1}^j \beta_1 \Delta \ln GDP_{t-i} + \sum_{i=1}^j \beta_2 \Delta \ln POP_{t-i} + \sum_{i=1}^j \beta_3 \Delta \ln ENG_{t-i} + \sum_{i=1}^j \beta_4 CO_{2t-i} + \sum_{i=1}^j \beta_5 \Delta \ln FD_{t-i} + \delta_1 \ln GDP_{t-i} + \delta_2 \ln POP_{t-i} + \delta_3 \ln ENG_{t-i} + \delta_4 CO_{2t-i} + \delta_5 \ln FD_{t-i} + \varepsilon_t \dots\dots\dots 7$$

$$\Delta \ln FD_t = \alpha_0 + \sum_{i=1}^j \beta_1 \Delta \ln FD_{t-i} + \sum_{i=1}^j \beta_2 \Delta \ln GDP_{t-i} + \sum_{i=1}^j \beta_3 \Delta \ln POP_{t-i} + \sum_{i=1}^j \beta_4 \Delta \ln ENG_{t-i} + \sum_{i=1}^j \beta_5 CO_{2t-i} + \delta_1 \ln FD_{t-i} + \delta_2 \ln GDP_{t-i} + \delta_3 \ln POP_{t-i} + \delta_4 \ln ENG_{t-i} + \delta_5 CO_{2t-i} + \varepsilon_t \dots\dots\dots 8$$

$$H_0 = \delta_1 = \delta_2 = \delta_3 = \delta_4 = \delta_5 = 0 \text{ No level relationship}$$

And alternative null hypothesis of cointegration:

$$H_1 = \delta_1 = \delta_2 = \delta_3 = \delta_4 = \delta_5 \neq 0 \text{ Level relationship exists}$$

RESULT AND DISCUSSION

Table 1 displayed the descriptive statistic; energy use has the highest means while the gross domestic product has the lowest mean value of all the variables. Also, energy use has the highest median value while the gross domestic product has the lowest median value. In the same vein, energy use has the highest minimum and maximum values while the gross domestic product has the least minimum and maximum values. However, the standard deviation, which measures the variability of a variable, shows that carbon dioxide emission (CO2) was the most volatile while financial development was the least volatile of all the variables. Furthermore, carbon dioxide emission (CO2), financial development and population were negatively skewed, while gross domestic product and energy use were positively skewed. All variables were normally distributed as the probability values of the Jar-Bera were well above 0.05 for critical values at a 5% level of significance.

The unit root test in table 2 shows that all variables were not stationary at level except population, and they were different once and became stationary. It implied that the variables were ordered one variable I(1) except population, an order zero I(0) variable. Having found the variables were integrated of a different order and the highest order been one. We proceed with our cointegration analysis using the ARDL method.

Table 1 Descriptive Statistics

Statistics	CO2	FD	GDP	LPOP	LENG
Mean	11.09	2.97	2.58	8.17	18.56
Median	11.16	2.98	2.51	8.38	18.56
Maximum	11.57	3.13	3.06	11.39	18.99
Minimum	10.47	2.76	2.22	4.97	18.13
Std. Dev.	0.38	0.08	0.24	2.20	0.25
Skewness	-0.34	-0.14	0.71	-0.08	0.01
Kurtosis	1.59	2.59	2.28	1.59	1.82
Jar-Bera	3.47	0.34	3.57	2.85	1.97
Probability	0.18	0.84	0.17	0.24	0.37
Observation	34	34	34	34	34

Source: Author's Computation

Table 2 Unit Root Test

Variable	Level			Variable	First difference		
	ADF	Critical Value	Result		ADF	Critical Value	Result
LCO2	-1.7946 (0.6844)	-3.5529	I(1)	ΔCO2	-5.5568 (0.0001)	-2.9571	I(0)
LFID	-2.1381 (0.5066)	3.5529	I(1)	ΔFID	5.2361 (0.0002)	-2.9571	I(0)
LGDP	-1.4288 (0.8333)	-3.5529	I(1)	ΔGDP	-3.1951 (0.0296)	-2.9571	I(0)
LPOP	-5.6913 (0.0005)	-3.5529	I(0)	ΔPOP	-	-	-
LENG	-2.6573 (0.0922)	-3.5529	I(1)	ΔENG	-6.0845 (0.0000)	-2.9571	I(0)

Note: Figure in parentheses are MacKinnon (1996) one-sided p-values.

Source: Author's Computation

Lag length selection

The first step in analysis involving the ARDL model is the determination of optimal lag length for each variable involved in the estimation. Using traditional unrestricted VAR procedures to determine symmetry lags length for all variables as in other class of autoregressive models does not provide optimal estimates for this model.

Table 3 displays the results of lag lengths selection criteria of our model using four information criteria. The Akaike information criteria (AIC), Schwarz information criteria (SIC), Hannan-Quinn criteria (HQC) and Adjusted R-squared (A.R.) all criteria select the same lag lengths for individual variables, except Adjusted R-squared (A.R.), which provide different lags length and it diagnostic test shows error term is not normally distributed. Since the diagnostic test of A.R. fails one of the OLS assumptions. We proceed to estimate cointegration among these variables with the selected ARDL (1, 0, 0, 4, 0) model. Moreover, the underlines diagnostic test for these information criteria shows these models are correctly specified; there is no first and second-order autocorrelation (serial correlation), No heteroscedasticity (Homoscedasticity), No ARCH effect in residual and normally distributed. Hence the model is suitable for inference. Also worthy of note, as stated by Pesaran et al. (2001), the serial correlation has consequences on cointegration result, hence assessing diagnostics tests before embarking on cointegration estimate from the selected model.

Table 3 Model Selection Criteria

Model	Model selection criteria			
	AIC ARDL(1, 0, 0, 4, 0)	SIC ARDL(1, 0, 0, 4, 0)	HQC ARDL(1, 0, 0, 4, 0)	Adj R ² ARDL(3, 0, 0, 4, 0)
D I A G N O S T I C	$\chi^2_{FF}(1)=0.2721$	$\chi^2_{FF}(1)=0.2721$	$\chi^2_{FF}(1)=0.2721$	$\chi^2_{FF}(1)=0.2992$
	$\chi^2_H=0.3727$	$\chi^2_H=0.3727$	$\chi^2_H=0.3727$	$\chi^2_H=0.4837$
	$\chi^2_{AKH}(1)=0.5837$	$\chi^2_{AKH}(1)=0.5837$	$\chi^2_{AKH}(1)=0.5837$	$\chi^2_{AKH}(1)=0.2579$
	$\chi^2_{SC}(1)=0.6493$	$\chi^2_{SC}(1)=0.6493$	$\chi^2_{SC}(1)=0.6494$	$\chi^2_{SC}(1)=0.8492$
	$\chi^2_{SC}(2)=0.9031$	$\chi^2_{SC}(2)=0.9031$	$\chi^2_{SC}(2)=0.9031$	$\chi^2_{SC}(2)=0.5823$
	$\chi^2_N=0.0955$	$\chi^2_N=0.0955$	$\chi^2_N=0.0955$	$\chi^2_N=0.0030$

Notes: χ^2_{FF} , χ^2_H , $\chi^2_{AKH}(1)$, $\chi^2_{SC}(1)$, $\chi^2_{SC}(2)$, χ^2_N are Lagrange multiplier statistic test for functional form

Mis-specification,

residual heteroscedasticity, ARCH effect, autocorrelation (serial correlation), non-normal error, respectively.

Source: Author's Computation

Table 4 Bound Co-integration Test.

Dep. Variable	No. Variable (K)	F-Statistics	Conclusion
F _{CO2} (CO2 FD, GDP, POP,ENG)	4	12.26	Cointegration
F _{FD} (FD CO2, GDP, POP, ENG)	4	4.55	Cointegration
F _{GDP} (GDP FD,CO2, POP, ENG)	4	6.05	Cointegration
F _{POP} (POP GDP, F.D.,CO2, ENG)	4	39.22	Cointegration
F _{ENG} (ENG POP, GDP, FD,CO2)	4	7.13	Cointegration
Pesaran, et al (2001) Critical Value	Sign. Level	I(0) Bound	I(1) Bound
	10%	2.45	3.52
	5%	2.86	4.01
	1%	3.74	5.06

Source: Author's Computation

The ARDL Bound Test

After appropriate lags have been determined, the next step is estimating the ARDL bound test cointegration approach. The test was carried out by estimating eq.(4) and the normalization method for eq. (5-8) By taking each variable as a dependent variable, Pesaran and Pesaran (1997) advocated using selected lags (1, 0, 0, 4, 0), and the estimated autoregressive distributed lag model displayed in Table 4.4. This test involves restricting the first lagged level for all variables using the F-statistic through the Wald test (bound test) to determine the joint significance of the level variables.

Table 4 shows that Carbon dioxide emission (CO2), financial development, Gross Domestic Product (GDP), Population (POP) and Energy use (ENG) were jointly co-integrated (long-run relationship). The F-statistic from bound test for F_{CO2}(CO2|FD, GDP, POP, ENG) = 12.26, F_{FD}(FD|CO2, GDP, POP, ENG) = 4.55, F_{GDP}(GDP|FD, CO2, POP, ENG) = 6.05, F_{POP}(POP|GDP, FD, CO2, ENG)= 39.22 and F_{ENG}(ENG|POP, GDP, FD, CO2)=7.13 were greater than upper bound of 4.01 Pesaran critical value at 5% level, four independent variables (k=4) with no constant and trend, case I. Hence we are 95 per cent confident that these variables have a long-run relationship; that is, they co-move in the long run. Having found the variables co-integrated, it means there must be an error correction model to determine the speed of adjustment in the short run when they might drift apart.

Table 5 Parsimonious statistical output for the short and long run model

Variable	Coefficient	Standard Error	t-statistics	Probability
Short Run Coefficient				
C	-10.72	4.23	-2.53	0.0187
ΔCO_2	0.52	0.20	2.56	0.0194
ΔLFD	0.48	0.23	2.05	0.0419
ΔLPOP	13.47	2.70	4.98	0.0000
$\Delta\text{LPOP}(-1)$	31.59	6.40	4.93	0.0001
$\Delta\text{LPOP}(-2)$	23.54	5.94	3.95	0.0006
$\Delta\text{LPOP}(-3)$	-5.41	2.22	-2.43	0.0232
ΔLENG	1.50	0.39	3.82	0.0009
$\text{ECM}(-1)$	-0.39	0.17	-2.20	0.0380
$R^2=0.9192$	Adj. R^2 =0.8740	F-statistic =20.4897(0.0000)	DW=1.1775	
Long Run Coefficient				
C	55.63	36.19	1.53	0.1351
LENG	1.69	0.64	2.64	0.0128
LFD	1.16	0.37	3.13	0.0040
LGDP	0.37	0.12	3.08	0.0380
LPOP	2.99	1.08	2.76	0.0126
$R^2=0.87025$	Adj. R^2 =0.8068	F-statistic=30.73 (0.0000)	DW=2.3774	

Source: Author's Computation

Table 6 Short and Long Run Diagnostic Test

Model Type	χ^2_{FF}	χ^2_H	$\chi^2_{ARH}(1)$	$\chi^2_{SC}(1)$	$\chi^2_{SC}(2)$	χ^2_N
Short Run	0.0965 (0.9242)	1.4213 (0.2478)	0.4472 (0.5095)	0.3195 (0.5793)	0.1514 (0.8607)	1.5025 (0.4717)
Long Run	0.2830 (0.7792)	1.5486 (0.2145)	1.6811 (0.7004)	0.7827 (0.6098)	0.9660 (0.1756)	1.1789 (0.5546)

Notes: χ^2_{FF} , χ^2_H , $\chi^2_{ARH}(1)$, $\chi^2_{SC}(1)$, $\chi^2_{SC}(2)$, χ^2_N are Lagrange multiplier statistic test for functional form

specification, residual heteroscedasticity (homoscedasticity), ARCH effect, autocorrelation (serial correlation), non-normal error, respectively.

Source: Author's Computation

Having found the variables are co-integrated with one another. Table 5 displayed estimated short and long-run results. Financial development impacted positively on environmental quality in Nigeria. That is, a 1% increases in financial development will lead to a 0.48% and 1.16% fall in environmental quality in Nigeria and statistically significant in both the short and long run. This result is consistent with (Zhang, 2011; Sadorsky, 2011; Sadorsky, 2010; Tamazian and Rao, 2010; Tamazian et al., 2009). This result is not surprising as more credit advances to business are gear toward the installation of new plant and expansion activities as against adoption of new technology that is an environmentally friendly or environmental quality enhancement in Nigeria and adoption of environmentally friendly/energy saving consumer product is at best very low, if any, because old and outdated electronics, used car Etc. are among the most patronized products by Nigerian consumers.

Change in the population growth, first, and second lagged of population lead to increase in CO₂ emission in the short run, however, the third lag of population leads to a reduction in CO₂ emission in the short run. For instance, a 1% change in population, first and second lagged of populations will lead to 13.47%, 31.59% and 23.54% increase in CO₂ emission respectively in the short run while 1% increase in third lags of the population will lead to 5.41% reduction in CO₂ reduction in Nigeria. Also, the population has a positive influence on environmental quality in the long run; a 1% per cent increase in population will lead to a 2.99% reduction in environmental quality. It implied the existence of environmental population Kuznets curve (EPKC) hold in both the long and short-run in Nigeria.

Furthermore, production has a positive and significant impact on the environment. A 1% increase in production will lead to an increase of 0.37% in environmental degradation. However, production was insignificant. Hence, it was the drop in the short run. It also implied that the environmental carbon Kuznets curve (ECKC) does not hold in Nigeria, given that the impact became significant in the long run as against insignificant short run, our result is inconsonant with the findings by (Lee & Chen, 2015 and Kais & Ben-Mbarek, 2017). The error correction term [ECM (-1)] is negative and statistically significant. It means any environmental disequilibrium

in the previous period, 39% are corrected in one year, all things being equal. Table 3 shows that independent variables explain adj R^2 87 and 81% in short and long-run variation in the dependent variable. The joint significant given by F-stat 30.8 p-value (0.00) and 20.7 (0.00) in the short and long run, collectively the independent variables, are significant determinant of the dependent variable.

Diagnostic Test

Table 4 displayed the diagnostic test result for functional form misspecification test; the analysis shows the model is free from function form misspecification bias, the error variance is Homoscedastic, no ARCH effect in the model, no first and second-order autocorrelation (serial correlation) in residual and residuals were normally distributed and white noise in both short and long run as displayed table 4. The coefficient stability test shows both short and long-run coefficients were stable, it can be discerned from the CUSUM and CUSUM squared test figure 1 and 2 that the line is well within the lower and upper critical bound of 5%.

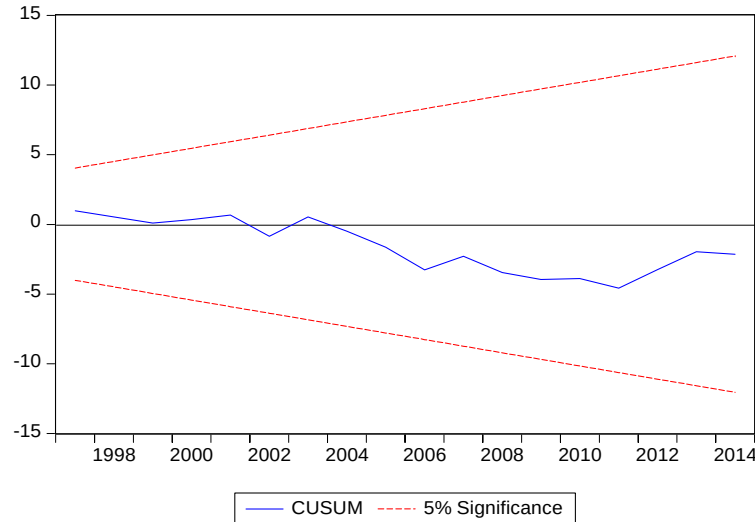


Figure 1 CUSUM coefficient stability graph

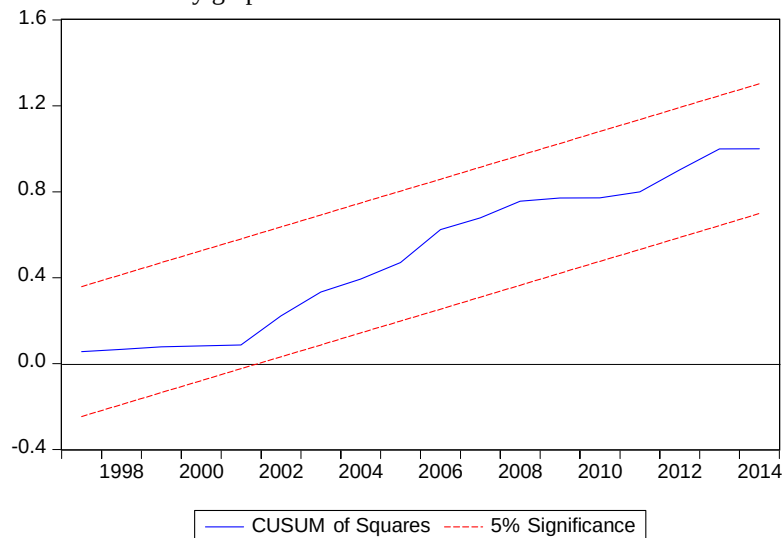


Figure 2 CUSUM Squared coefficient stability graph.

Analysis of Short Run Causality

To determine short-run causality from independent variables to the dependent variable; the test was conducted on non-parsimonious results obtained from the short-run model by imposing joint restriction on change and lags of each variable via F-statistic through Wald test; null hypothesis: the variables are jointly zero. Table 5 shows short-run causality among variables in the carbon dioxide emission (CO_2) model. Financial development, Economic growth, Energy usage and population all cause carbon dioxide emission in the short run.

Table 5 Short-run Causality

Direction of Causality	F-stat	P-value	Conclusion
Financial development → CO ₂	5.6313	0.0278	Causal effect
Economic Growth → CO ₂	8.9583	0.0072	Causal effect
Energy Use → CO ₂	15.7539	0.0008	Causal effect
Population → CO ₂	7.5154	0.0004	Causal effect

Source: Author's computation

CONCLUSION AND POLICY RECOMMENDATION

The role of environmental quality on sustainable growth and development of Nigeria's economy or any other cannot be overemphasized in policy formulation and implementation and its implication on the sustainability of the economy. The paper examined the impacts of financial development on environmental quality in Nigeria from 1981 to 2018. The study employed an autoregressive distributed lag method to examine the level relationship (long run) among the variable of interest; Carbon dioxide emission (CO₂), financial development, energy usage, economic growth and population growth.

Financial development, population growth, economic growth, and energy usage were positive contributors to environmental degradation in Nigeria's short and long run. Despite the negative impact of these factors on environmental quality, the analysis shows the environmental population Kuznets curve (EPKC) hold in Nigeria. However, the environmental carbon Kuznet curve (ECKC) does not hold in Nigeria. The result further shows that, this variable had a level relationship (long run), which is confirmed by the negative and statistical significance of the error term. That is any disequilibrium in the previous period, 39% is corrected in one year. Also, there is a short-run causal effect from financial development, economic growth, energy usage and population to carbon dioxide emission. The result emphasizes the need to channel financial resources toward clean energy projects and adopt new technology to improve carbon footprint to improve environmental quality. The government should take the lead in adopting renewable energy technology and decommissioning nonrenewable technology aggressively in Nigeria.

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AN ASSESSMENT OF THE IMPACT OF RURAL BANDITRY IN SABON BIRNI LOCAL GOVERNMENT AREA OF SOKOTO STATE, NORTH WESTERN NIGERIA

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Abstract

This study examined the effect of banditry on livelihood of rural households in Sokoto State, North Western Nigeria. Data was collected from sampled households in the banditry prone communities of Sabon Birni Local Government Areas of Sokoto State. Descriptive and inferential statistics were employed to analyze the data. The study revealed that rural households have been subjected to frequent banditry attacks in which they rustle livestock, and abducts household members. Banditry also threatened farming activities, which is the major means of livelihood in the study area, as most farmers become afraid of going to farms for fear of being attacked by the bandits. In line with the findings, there is the need to ensure optimum security in these communities by deploying adequate stationed security personnel. An interventions and programmes on alternative means of rural livelihood should also be introduced in the rural areas of the state. There is also need to improved and sustained community-security personnel relation. The government also needs to ensure that the rural areas are provided with basic education, social amenities, infrastructures and other basics of livelihood.

Keywords: Banditry, Livelihood, Rural household, Sokoto State

INTRODUCTION

In recent time, the North Western Nigeria has been plagued by the scourge of armed banditry and continues to subject rural communities in the region to frequent attacks, looting grain and food reserve, rustle livestock, abducting females and subjecting them to various forms of abuses. Banditry has caused a great havoc of insecurity in the region. It disrupts rural economic activities, threatened farming activity and has emerged as a major challenge to public safety and internal security in the North Western Nigeria. There is growing concern in parts of Northern Western Nigeria over insecurity caused by bandits.

Many people have been killed over the past decade by armed bandits in the North Western Nigeria. The menace tends to be high in rural areas of Katsina, Zamfara and Sokoto states of North Western Nigeria. Nigeria Security Tracker documented that fatalities from banditry in 2017 and 2018 were 1,041 and 2,037 deaths respectively (Campbell, 2018). It has been revealed that over 180,000 persons registered in eight officially designated Internally Displaced Persons (IDPs) camps in most part of 2018 while over 500,000 displaced people have turned into “refugees” in their various localities as they squat in uncompleted buildings in the most deplorable conditions (Ortom, 2019).

The menace of armed banditry in Sabon Birni local government of Sokoto state is worsened by the proliferation of light weapons. The difficult terrain of the area particularly the scenario around the bush of MUJABURA and BURKUSUMA bordering Niger republic, couple with lack of social amenities such as good roads, absence of power supply, health facilities and poverty aggravated the situation. Thus transforming the area into ideal space for banditry and provide potential routes for banditry activities.

It is against this background we intend to undertake an in-depth study on the impact of armed banditry in rural areas of Eastern Senatorial District of Sokoto state, North Western Nigeria. Specifically the study will examine the impact of armed banditry on livelihood of rural household in Sabon Birni local government area. The study is presented in five sections which comprises the first section as an introduction, the second section review literature, the third section presents the methodology, forth is the presentation of data and discussion while the fifth is the conclusion.

LITERATURE REVIEW

Theoretical Review

The study attempts critical review of relevant theories that have the potential of explaining the research problem in a bid to identifying suitable model(s) that could satisfactorily address the impact of armed banditry and its attendant consequences on livelihood of rural household.

Because of the complexity of the study, we will adopt Household utility theory and broad concept of anomie theory. Household utility theory was developed by Michael and Becker (1973). Household utility theory emphasized on the role of marginal utility in determining household labour resource allocative decision into various form of income generating activities.

On the other hand, Shalangwa (2013) stated that a number of theorists have tried to explain criminal behavior that appears to be heavily concentrated in the lower class social groups, and several theorists have based their explanation on the concept of anomie originally described by Emile Durkheim in the 19th century. Following on the work of Emile Durkheim, strain theory have been advanced by Robert K. Merton 1957; Albert K. Cohen 1955; Richard Cloward and Lloyd Ohlin 1960; and Robert Agnew 1992.

This study will also adopt the broad concept of anomie. This is because, to Durkheim, a situation of anomie arose only when weak social regulation was unable to restrain people's aspirations during economic turmoil, while for Merton, it resulted from the lack of a structured and legitimate means for most people in the society to attain what is indiscriminately held out to all as the ultimate goal –material wealth. However, not everyone will be able to attain such wealth but, everyone is expected to try, or risk being called lazy or unambitious.

Empirical Review

In an attempt to address insecurity in Nigeria, several studies have examined the impact of banditry on livelihood of rural households (Ladan and Mutawalli 2020; Campbell 2018; Ortom 2019). However, little is known about how banditry in North Western Nigeria and its impact on rural livelihood. Most of the research on insecurity has been perennial and give emphasis on Boko Haram insurgency and herdsmen-farmer conflicts.

Ladan and Matawalli (2020), explain the impacts of banditry on food security in Katsina state. The methodology adopted is focus group discussion. The results have shown that banditry has negatively affected food security in Katsina State. According to Gdzama, Saddiq, Oduhie and Dariya (2018).examines rural banditry and its effects on rural economy in Kamuku forest in BirninGwari local government of Kaduna state. The study used descriptive statistics and the results shows that banditry affects rural economy. Similarly, Shalangwa, (2013), studied the nature and consequences of armed banditry in communities of Adamawa State, using a qualitative data. The results indicates that armed banditry was as a result of influx of ex-combatants from Nigeria's neighbouring war torn countries, unemployment, easy availability of arms.. In another study, Agbu, Musa and Zhema (2020), examines the consequences of the activities of Boko Haram insurgency and armed banditry in the Northern part of Nigeria. The study used multi-disciplinary approach in analysing the two phenomenons. The study reveals that Boko Haram insurgency and armed herdsmen attacks in the North East region leading to the social, political and economic instability in North East and Nigeria as a whole. Meanwhile, Okoli and Agada (2004), examines the phenomenon of kidnapping in Nigeria with a view to underscore its implications for national security. Data was sourced through secondary source and qualitative analysis was employed. The study reveals that kidnapping has been motivated and sustained by criminal quest for material accumulation.

On their own efforts, Uche and Iwuamadi (2018), studied the upsurge in rural violence in Nigeria by the activities of armed herdsmen invasion of Nimbo community in Enugu state. The study reveals that, beyond the common conflicts triggers the factionalisation of a local vigilante in the Nimbo community breed criminals' activities that escalated the tensed environment. Awotokum, Nwozo and Shola, J (2020), examines conflicts and the retrogression of sustainable development. This study generated both primary and secondary data to evaluate the socio-economic and political implications of the herders-farmers conflicts in Nigeria. The study reveals that herders-farmers conflicts have inflicted serious costs on the Nigerian economy.

The same way, Okoli and Abubakar (2021), investigated the phenomenon of crime loadism as a new trend in armed banditry in Nigeria. The study adopted a mixed qualitative method to analysed data. The results of the study reveals that the prevalence of grossly under-governed territorial space in the country side by side and border of the Nigeria created vacuum of security that is being exploited by criminals. Much more than this, Mawoli and Adamu, (2020), sought to examine academics' recommendations on the sustainable panacea to Herders-Farmers conflict in Nigeria. The study used content analysis. for analyzing the data.

METHODOLOGY

Sampling Procedure

A cross sectional Multi Stage sampling procedure was adopted in this study. In the first stage, three (3) wards with high reported cases of banditry attacks were purposely selected. In the second stage, three (3) most affected banditry prone communities were purposively selected from the LGA. Then lastly, a total number of 10 households' were randomly selected from each of the selected community, two (2) out of which cover expected un-retrieved questionnaires. This gives a total number of 48 households that represent the sample size of the population. The names of selected communities are presented in Table 1. The sample size of the study was computed using a Krecie and Morgan Table. The population of the study was determined on the basis of the Nigerian Bureau of statistics data.

Table 1: Sample of Respondents

No.	Ward	Selected Banditry Prone communities			Sample Size
1.	Gangara	Gnagara	Dantasakko	Elum	9
2.	Gatawa	Dunkawa	Burkusuma	Dama	8
3.	Tarah	Tarah	Garin Idi	Tashalawa	8
4.	Kurawa	Masawa	Garki	Dan Adua	8
5.	Lajinge	Dantudu	Gajet	Turtsawa	7
6	Tsamaye	Makwana	Alkalawa	Yarbulutu	8
Total Sample of Respondents					48

Source: Field Survey, 2020

In all, forty eight households were selected from the selected communities. It is important to note that some of the selected prone banditry communities with high tense of insecurity were interviewed at the local government headquarters-Sabon Birni. A structured questionnaire was developed as an instrument for data collection. The questionnaire focuses on the socio-economic characteristics of the respondents, causes and effects of banditry on livelihood of rural households in the affected communities.

RESULTS AND DISCUSSION

The data obtained from the survey was analyzed using descriptive and inferential statistics. Descriptive statistics of household socio-demographic characteristics presented in Table 2 indicates that 61% of the households were headed by males and 39% females. The marital status of the respondents indicated that about 85% of the female headed are widows that their husbands were killed by either natural death or armed banditry. The results further reveals that despite rising level of insecurity, farming remains the major means of livelihood of predominance of the population. Others engaged in petty trading, and other means of livelihood activities to earn income.

The descriptive results also show that overwhelming majority (49%) of the respondents are within 20 – 40 age bracket. Forty five per cent (45%) of the respondent are 41– 60 age bracket while 3% and 2% consists of respondents above 60 years and 20 years and below respectively. This implies that the majority of the households are in their active, rational and productive ages; a condition expected to impact positively on productivity. It is evident from the results that about 82% of the households have not acquired formal education. It shows that only 18% have formal education; with 6% Primary education, 7% Secondary education and 5% diploma and equivalents. This indicates that there is high level of illiteracy in the banditry prone areas of Sabon Birni local government.

Table 2: Socio-Demographic Characteristics of Households

Variable	Frequency	Percentage	Mean
Gender of Household Head			
Male	29	61	
Female	19	39	
Total	48	100	
Age (Years)			42.59
20 and Below	2	2.64	
21-40	23	48.81	
41-60	21	45.12	
61 and Above	2	3.43	
Total	48	100	
MARITAL STATUS			
Married	29	60.42	
Widowed	17	35.09	
Divorced	2	4.49	
Total	48	100	
EDUCATIONAL QUALIFICATION			
No Formal Education	39	82.60	
Primary	3	5.80	
Secondary	4	7.39	
Diploma and Equivalent	2	4.75	
Degree and Equivalent	0	0.00	
Total	48	100	
MAJOR OCCUPATION			
Unemployed	13	27.70	
Crop Rained Farming	17	34.56	
Petty Trading	10	21.11	
Livestock Farming	2	3.96	
Civil Servants	1	2.37	
Transportation	1	2.90	
Waving	2	3.17	
Mining	0	0.79	
General Service	2	3.43	
Total	48	100	
HOUSEHOLD SIZE (NUMBER)			10
Less than 5	13	27.18	
6-10	19	39.05	
11-20	14	29.29	
More than 20	2	4.49	
Total	48	100	

Source: Field Survey, 2020

The findings further reveals that households across the banditry prone communities have a large population with an overall average size of 10 members. The large household size has implication for resource allocation and banditry activities, particularly in an area where majority of the population are poor and extremely vulnerable with fewer or no assets.

Results on the impact of banditry on household livelihood presented in Table 3 indicated that banditry has adversely affected the means of household livelihood in the banditry prone communities. About 30.61% of households had lost their occupations due to rising level of insecurity in the state. This may likely deepen employment crisis which have been one of the drivers of banditry crime in the region. By comparing means of household livelihood in pre banditry and banditry periods, the results show that about 25% of the households have quit farming activity due to fear of banditry attack. Quittance from farming lead to decline in agricultural production in the midst of the existing food crisis, thereby enhancing food insecurity in the region and the state as a whole. Banditry has also limited trade flows which consequently lead to decline in market supplies in some worse affected areas. The results presented in Table 3 also revealed that about 3.16% of the rural households have moved to transportation and General services sector. This Issue will be devastated if predominant farmers form the quantum of transition to other set of jobs.

Table 3: Impact of Banditry on Means of Livelihood

Major Means of Livelihood	Pre-banditry Period		Banditry Period		Banditry Impact
	Hhs No.	%	Freq	%	
Unemployed	0	0	14	30.61	30.61% lost their jobs
Rain-fed Farming	27	57.15	15	32.19	25% abandoned farming
Petty Trading	12	24.80	10	20.32	4.5% stop trading
Livestock Farming	4	7.65	2	3.69	4% stop livestock farming
Civil Servant	1	2.37	1	2.37	No Change
Transportation	1	2.11	2	3.17	1.06 moved to transportation
Weaving	2	3.69	2	3.43	1.07 stops Weaving
Mining	0	0.79	0	0.79	No Change
General Services	1	1.32	2	3.43	2.11% moved to General Service
Total	48	100	48	100	

Source: Field Survey, 2020

The results also indicated that banditry crime had devastating effect on farming activity in banditry prone communities of Sabon Birni LGA. Results presented in Table 4 revealed that about 53.83% of the households have abandoned their farm land due to fear of banditry attack. Out of the 53.8%; 11 % fall in the category of 0.5-3 hectares, 27 % abandoned 2-3 hectare and about 13.48%. Farming activity has now been restricted within distances of few kilometers from the city and village centers due to fear of attacks by the bandits. This has made majority of farmers to be cultivating less than 1 hectare of land. Accordingly, significant percentage of large-scale farmers cultivating 4 hectares and above, have abandoned their farmlands.

Table 4: Impact of Banditry on Farming Activity

SIZE OF CULTIVATED FARM LAND (In Hectares)	PRE BANDITRY PERIOD		BANDITRY PERIOD		FARM ABANDONED DUE TO FEAR OF BANDIT ATTACK (In Hectares)
	Freq	%	Freq	%	
0	0	0	26	53.83	54 % Abandoned Entire Land
<1.00	10	20.32	9	19.53	1.04% Abandoned <1.00 Hectares
1.01-2.00	15	32.98	11	22.96	10.02 Abandoned 1-2 Hectares
2.01-3.00	14	28.23	1	1.32	27% Abandoned 2-3 Hectares
3.01-4.00	4	7.92	1	2.37	2.93% Abandoned 3-4 Hectares
>4.00	5	10.55	0	0	10.55 Abandoned >4.00 Hectares
Total	48	100	48	100	

Source: Field Survey, 2020

The result presented in Table 5 indicated that banditry has adversely affected livestock holding of households residing in banditry prone communities of Sokoto state. Out of households that owns livestock, 68.4 percent lost their cattle, 64.8 sheep and 53.83 goats to the bandits. Loss of livestock in the communities tend to affect banditry coping strategy as most of the households sell their livestock to cope with banditry shock. It also affects food security and nutritional status of the region and entire country as rural households reared livestock.

Table 5: Impact of Banditry on Livestock Holding

Livestock Stolen by bandits	Number of affected Households	Percentage
Cattles:		
<5	142	37.74
6-10	73	19.26
11-15	24	6.33
16-20	13	3.43
>20	7	1.85
Total	259	68.34
Sheeps:		
<10	142	37.47
10-20	56	14.78
21-30	34	8.97
31-40	8	2.11
>40	4	1.06
Total	244	64.38
Goats:		
<10	108	28.50
10-20	52	13.72

21-30	19	5.01
31-40	16	4.22
>40	09	2.37
Total	204	53.83

5.0 Conclusion and Recommendations

This study examined the impact of banditry on livelihood of rural households in banditry prone communities of Sokoto State. The results indicate that banditry has adversely affected rural economic activities. The intensification of the bandit attacks led to loss of assets such as cattle, sheep, goats and livelihoods. Fear of bandit attack has also threatened farming activity, which is major means of rural livelihood in the area.

The results have implication on planning of interventions and policies targeted towards rural development, poverty reduction and improvement of food security in banditry areas. It implies the need for the policy makers and authorities to consider the development of their local development plans on the needs and priorities of banditry prone communities.

To cushion the adverse effect of banditry on rural livelihood, there is also need to ensure optimum security in banditry communities by deploying adequate stationed security personnel. An interventions and programmes on alternative means of rural livelihood should also be introduced to improve rural livelihood. There is also need to improved and sustained community-security personnel relation. The government also needs to ensure that the rural areas are provided with basic education, social amenities, infrastructures and other basics of livelihood.

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AN ASSESSMENT OF THE IMPACT OF RURAL BANDITRY IN SABON BIRNI LOCAL GOVERNMENT AREA OF SOKOTO STATE, NORTH WESTERN NIGERIA

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Abstract

This study examined the effect of banditry on livelihood of rural households in Sokoto State, North Western Nigeria. Data was collected from sampled households in the banditry prone communities of Sabon Birni Local Government Areas of Sokoto State. Descriptive and inferential statistics were employed to analyze the data. The study revealed that rural households have been subjected to frequent banditry attacks in which they rustle livestock, and abducts household members. Banditry also threatened farming activities, which is the major means of livelihood in the study area, as most farmers become afraid of going to farms for fear of being attacked by the bandits. In line with the findings, there is the need to ensure optimum security in these communities by deploying adequate stationed security personnel. An interventions and programmes on alternative means of rural livelihood should also be introduced in the rural areas of the state. There is also need to improved and sustained community-security personnel relation. The government also needs to ensure that the rural areas are provided with basic education, social amenities, infrastructures and other basics of livelihood.

Keywords: Banditry, Livelihood, Rural household, Sokoto State

INTRODUCTION

In recent time, the North Western Nigeria has been plagued by the scourge of armed banditry and continues to subject rural communities in the region to frequent attacks, looting grain and food reserve, rustle livestock, abducting females and subjecting them to various forms of abuses. Banditry has caused a great havoc of insecurity in the region. It disrupts rural economic activities, threatened farming activity and has emerged as a major challenge to public safety and internal security in the North Western Nigeria. There is growing concern in parts of Northern Western Nigeria over insecurity caused by bandits.

Many people have been killed over the past decade by armed bandits in the North Western Nigeria. The menace tends to be high in rural areas of Katsina, Zamfara and Sokoto states of North Western Nigeria. Nigeria Security Tracker documented that fatalities from banditry in 2017 and 2018 were 1,041 and 2,037 deaths respectively (Campbell, 2018). It has been revealed that over 180,000 persons registered in eight officially designated Internally Displaced Persons (IDPs) camps in most part of 2018 while over 500,000 displaced people have turned into “refugees” in their various localities as they squat in uncompleted buildings in the most deplorable conditions (Ortom, 2019).

The menace of armed banditry in Sabon Birni local government of Sokoto state is worsened by the proliferation of light weapons. The difficult terrain of the area particularly the scenario around the bush of MUJABURA and BURKUSUMA bordering Niger republic, couple with lack of social amenities such as good roads, absence of power supply, health facilities and poverty aggravated the situation. Thus transforming the area into ideal space for banditry and provide potential routes for banditry activities.

It is against this background we intend to undertake an in-depth study on the impact of armed banditry in rural areas of Eastern Senatorial District of Sokoto state, North Western Nigeria. Specifically the study will examine the impact of armed banditry on livelihood of rural household in Sabon Birni local government area. The study is presented in five sections which comprises the first section as an introduction, the second section review literature, the third section presents the methodology, forth is the presentation of data and discussion while the fifth is the conclusion.

LITERATURE REVIEW

Theoretical Review

The study attempts critical review of relevant theories that have the potential of explaining the research problem in a bid to identifying suitable model(s) that could satisfactorily address the impact of armed banditry and its attendant consequences on livelihood of rural household.

Because of the complexity of the study, we will adopt Household utility theory and broad concept of anomie theory. Household utility theory was developed by Michael and Becker (1973). Household utility theory emphasized on the role of marginal utility in determining household labour resource allocative decision into various form of income generating activities.

On the other hand, Shalangwa (2013) stated that a number of theorists have tried to explain criminal behavior that appears to be heavily concentrated in the lower class social groups, and several theorists have based their explanation on the concept of anomie originally described by Emile Durkheim in the 19th century. Following on the work of Emile Durkheim, strain theory have been advanced by Robert K. Merton 1957; Albert K. Cohen 1955; Richard Cloward and Lloyd Ohlin 1960; and Robert Agnew 1992.

This study will also adopt the broad concept of anomie. This is because, to Durkheim, a situation of anomie arose only when weak social regulation was unable to restrain people's aspirations during economic turmoil, while for Merton, it resulted from the lack of a structured and legitimate means for most people in the society to attain what is indiscriminately held out to all as the ultimate goal –material wealth. However, not everyone will be able to attain such wealth but, everyone is expected to try, or risk being called lazy or unambitious.

Empirical Review

In an attempt to address insecurity in Nigeria, several studies have examined the impact of banditry on livelihood of rural households (Ladan and Mutawalli 2020; Campbell 2018; Ortom 2019). However, little is known about how banditry in North Western Nigeria and its impact on rural livelihood. Most of the research on insecurity has been perennial and give emphasis on Boko Haram insurgency and herdsman-farmer conflicts.

Ladan and Matawalli (2020), explain the impacts of banditry on food security in Katsina state. The methodology adopted is focus group discussion. The results have shown that banditry has negatively affected food security in Katsina State. According to Gdzama, Saddiq, Oduhie and Dariya (2018).examines rural banditry and its effects on rural economy in Kamuku forest in BirninGwari local government of Kaduna state. The study used descriptive statistics and the results shows that banditry affects rural economy. Similarly, Shalangwa, (2013), studied the nature and consequences of armed banditry in communities of Adamawa State, using a qualitative data. The results indicates that armed banditry was as a result of influx of ex-combatants from Nigeria's neighbouring war torn countries, unemployment, easy availability of arms.. In another study, Agbu, Musa and Zhema (2020), examines the consequences of the activities of Boko Haram insurgency and armed banditry in the Northern part of Nigeria. The study used multi-disciplinary approach in analysing the two phenomenons. The study reveals that Boko Haram insurgency and armed herdsman attacks in the North East region leading to the social, political and economic instability in North East and Nigeria as a whole. Meanwhile, Okoli and Agada (2004), examines the phenomenon of kidnapping in Nigeria with a view to underscore its implications for national security. Data was sourced through secondary source and qualitative analysis was employed. The study reveals that kidnapping has been motivated and sustained by criminal quest for material accumulation.

On their own efforts, Uche and Iwuamadi (2018), studied the upsurge in rural violence in Nigeria by the activities of armed herdsman invasion of Nimbo community in Enugu state. The study reveals that, beyond the common conflicts triggers the factionalisation of a local vigilante in the Nimbo community breed criminals' activities that escalated the tensed environment. Awotokum, Nwozo and Shola, J (2020), examines conflicts and the retrogression of sustainable development. This study generated both primary and secondary data to evaluate the socio-economic and political implications of the herders-farmers conflicts in Nigeria. The study reveals that herders-farmers conflicts have inflicted serious costs on the Nigerian economy.

The same way, Okoli and Abubakar (2021), investigated the phenomenon of crime loadism as a new trend in armed banditry in Nigeria. The study adopted a mixed qualitative method to analysed data. The results of the study reveals that the prevalence of grossly under-governed territorial space in the country side by side and border of the Nigeria created vacuum of security that is being exploited by criminals. Much more than this, Mawoli and Adamu, (2020), sought to examine academics' recommendations on the sustainable panacea to Herders-Farmers conflict in Nigeria. The study used content analysis. for analyzing the data.

METHODOLOGY

Sampling Procedure

A cross sectional Multi Stage sampling procedure was adopted in this study. In the first stage, three (3) wards with high reported cases of banditry attacks were purposely selected. In the second stage, three (3) most affected banditry prone communities were purposively selected from the LGA. Then lastly, a total number of 10 households' were randomly selected from each of the selected community, two (2) out of which cover expected un-retrieved questionnaires. This gives a total number of 48 households that represent the sample size of the population. The names of selected communities are presented in Table 1. The sample size of the study was computed using a Krecie and Morgan Table. The population of the study was determined on the basis of the Nigerian Bureau of statistics data.

Table 1: Sample of Respondents

No.	Ward	Selected Banditry Prone communities			Sample Size
1.	Gangara	Gnagara	Dantasakko	Elum	9
2.	Gatawa	Dunkawa	Burkusuma	Dama	8
3.	Tarah	Tarah	Garin Idi	Tashalawa	8
4.	Kurawa	Masawa	Garki	Dan Adua	8
5.	Lajinge	Dantudu	Gajet	Turtsawa	7
6	Tsamaye	Makwana	Alkalawa	Yarbulutu	8
Total Sample of Respondents					48

Source: Field Survey, 2020

In all, forty eight households were selected from the selected communities. It is important to note that some of the selected prone banditry communities with high tense of insecurity were interviewed at the local government headquarters-Sabon Birni. A structured questionnaire was developed as an instrument for data collection. The questionnaire focuses on the socio-economic characteristics of the respondents, causes and effects of banditry on livelihood of rural households in the affected communities.

RESULTS AND DISCUSSION

The data obtained from the survey was analyzed using descriptive and inferential statistics. Descriptive statistics of household socio-demographic characteristics presented in Table 2 indicates that 61% of the households were headed by males and 39% females. The marital status of the respondents indicated that about 85% of the female headed are widows that their husbands were killed by either natural death or armed banditry. The results further reveals that despite rising level of insecurity, farming remains the major means of livelihood of predominance of the population. Others engaged in petty trading, and other means of livelihood activities to earn income.

The descriptive results also show that overwhelming majority (49%) of the respondents are within 20 – 40 age bracket. Forty five per cent (45%) of the respondent are 41– 60 age bracket while 3% and 2% consists of respondents above 60 years and 20 years and below respectively. This implies that the majority of the households are in their active, rational and productive ages; a condition expected to impact positively on productivity. It is evident from the results that about 82% of the households have not acquired formal education. It shows that only 18% have formal education; with 6% Primary education, 7% Secondary education and 5% diploma and equivalents. This indicates that there is high level of illiteracy in the banditry prone areas of Sabon Birni local government.

Table 2: Socio-Demographic Characteristics of Households

Variable	Frequency	Percentage	Mean
Gender of Household Head			
Male	29	61	
Female	19	39	
Total	48	100	
Age (Years)			42.59
20 and Below	2	2.64	
21-40	23	48.81	
41-60	21	45.12	
61 and Above	2	3.43	
Total	48	100	
MARITAL STATUS			
Married	29	60.42	
Widowed	17	35.09	
Divorced	2	4.49	
Total	48	100	
EDUCATIONAL QUALIFICATION			
No Formal Education	39	82.60	
Primary	3	5.80	
Secondary	4	7.39	
Diploma and Equivalent	2	4.75	
Degree and Equivalent	0	0.00	
Total	48	100	
MAJOR OCCUPATION			
Unemployed	13	27.70	
Crop Rained Farming	17	34.56	
Petty Trading	10	21.11	
Livestock Farming	2	3.96	
Civil Servants	1	2.37	
Transportation	1	2.90	
Waving	2	3.17	
Mining	0	0.79	
General Service	2	3.43	
Total	48	100	
HOUSEHOLD SIZE (NUMBER)			10
Less than 5	13	27.18	
6-10	19	39.05	
11-20	14	29.29	
More than 20	2	4.49	
Total	48	100	

Source: Field Survey, 2020

The findings further reveals that households across the banditry prone communities have a large population with an overall average size of 10 members. The large household size has implication for resource allocation and banditry activities, particularly in an area where majority of the population are poor and extremely vulnerable with fewer or no assets.

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Major Means of Livelihood	Pre-banditry Period		Banditry Period		Banditry Impact
	Hhs No.	%	Freq	%	
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Rain-fed Farming	27	57.15	15	32.19	25% abandoned farming
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Table 4: Impact of Banditry on Farming Activity

SIZE OF CULTIVATED FARM LAND (In Hectares)	PRE BANDITRY PERIOD		BANDITRY PERIOD		FARM ABANDONED DUE TO FEAR OF BANDIT ATTACK (In Hectares)
	Freq	%	Freq	%	
0	0	0	26	53.83	54 % Abandoned Entire Land
<1.00	10	20.32	9	19.53	1.04% Abandoned <1.00 Hectares
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3.01-4.00	4	7.92	1	2.37	2.93% Abandoned 3-4 Hectares
>4.00	5	10.55	0	0	10.55 Abandoned >4.00 Hectares
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AN ANALYSIS OF THE IMPACT OF ELECTRICITY SUPPLY ON THE OUTPUT OF SMALL AND MEDIUM ENTERPRISES IN NIGERIA

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Abstract

This study examined the impact of electricity supply on output level of Small and Medium scale Enterprises in Nigeria between 1988 and 2019. The study was motivated on the grounds of constant power outages in the country that is so detrimental to the firms' productivity. The methodology of Vector Error Correction Mechanism (VECM) was employed and it was found that electricity supply is positively and significantly related to SMEs output. It was also revealed that electricity supply Granger causes SMEs output for the period under study. It was further revealed in the study that government expenditure on infrastructure is positively and significantly related to SMEs output. Government expenditure on infrastructure was also found to Granger cause SME output in Nigeria. It was therefore recommended that policy makers need to quickly design policies that will tackle the generation of electricity, liberalise the sector more for private enterprises that have the capacity to operate at that level to come in and there is also a need to further liberalise the section of the supply chain to avoid regional monopoly of the distribution companies.

JEL Classification: L66, L67, O13

Keywords: Electricity Supply, Small and Medium, Enterprises, Firms Output

INTRODUCTION

Most activities and especially all economic activities of man revolve around electricity supply in the nation. More importantly, electricity supply plays an important role in the socio-economic and technological development of every nation. It is needed in the production process and therefore can be considered as one major factor that affects production. Any change in the quality and quantity of electricity supply available for the production of goods and services will greatly influence production and evidently the level of output of both industries. Inadequate electricity supply and its effect on business enterprises especially small and medium enterprises has been a subject of concern in the third world or developing countries. Electricity supply is part of the economic infrastructure mostly needed for increased performance and output of firms. The interrelationship between electricity supply and productivity and social services has been asserted to be very strong (Sambo, Garba, Zarma, and Gaji, 2010).

The small and medium enterprises form the bulk of the production sub-sector in the Nigerian economy (Ariyo, 1999; Ihua, 2005), yet, a major factor that could aid their productive performance has been left practically unattended. Electricity supply gap has been of great concern over the past few decades. In 2003, the Energy Commission of Nigeria projected that the country needed to generate at least 103,000MW by 2020 if it would attain the required full economic industrialisation (Sambo, Garba, Zarma and Gaji, 2010) but so far, only about 5,150MW has been the highest electricity supply generated in the country since 1980 and according to Awoyinka (2018) the country will need about 180,000MW to enjoy a stable electricity supply.

Consequent upon this irregular supply of electricity, the country constantly experiences a decline in production and profitability. The work of Adenikinju (2003) showed that there is a strong correlation between the amount of electricity supplied and the performance of business enterprises. Efficiency of electricity supply from the national grid brings down the running and overhead costs of businesses and that leads to higher profitability in the long run. Failure to provide adequate electricity makes the firms spend the money that could have been reinvested while trying to secure an alternative source of power, which are not cost effective on productivity, simply because of additional maintenance costs.

In an attempt to improve the supply challenge of electricity in the country, there has been a lot of government spending in the area of infrastructure that should have helped to boost the supply, but rather than improving, the story has not significantly changed. It is expected that increase in public spending on electricity should positively improve the supply and positively impact on SMEs output. However, the position of erratic power and inadequate power supply has remained unaddressed and it has led to the closure of several SMEs who cannot cope with costs of alternative power generation. This work therefore is set out to examine the effect of electricity supply on the output of small and medium scale enterprises in Nigeria.

LITERATURE REVIEW

Lugman, Hag and Ahmad (2021) studied the role deficiency of quality and dependable electric power supply could have on the performance and competitive ability of firms in the developing economies especially in the South East Asian countries. The Stochastic Frontier methodology was employed in the analysis and the use of Ordinary Least Square and Beta regression were employed to estimate the parameters. The findings revealed that power outages lead to a technical efficiency of firms in South East Asian countries. It was therefore recommended that the countries concerned should embark on appropriate and adequate investment in the energy sector to enjoy a secure and reliable power supply in the countries and consequently increase in productivity and competitive capacity.

Olabode (2019) attempted to examine the problem of electricity supply and the small-scale businesses' performance in Ondo State. Using both descriptive and multiple regression methods of estimation, the findings revealed that the capacity, duration and how reliable electricity supply is affects small businesses' performance positively. Howbeit, the work could not establish the link between the cost of supply of electricity, its quality and business performance in the state. It was therefore recommended that policies that could improve the quality and quantity of electricity should be designed to positively enhance the productivity of small businesses in Nigeria.

Abdisa (2018) examined the constraint that power supply unreliability has on productivity of firms in developing countries especially in Ethiopia between 2011 and 2015. The World Bank data was used to carry out the analysis and the findings revealed that firms' productivity were negatively affected and similarly increasing the production cost by 15 percent. It was discovered that the cost is higher for smaller firms because of the size of their output. This result was substantiated by the work of Cole, Elliot, Occhiali and Strobi (2018) on 14 countries in Sub-Saharan Africa. They were able to construct an instrument to represent the power outages dependent on the size of electric power produced by the hydro stations. Firm-level data from the World Bank Enterprise survey was used and the results revealed that there exists a negative relationship between firms' sales and power instability. It was further established that if other countries can reduce their power outages to the level obtained in South Africa, firms in these countries will increase their sales by 85.1 percent and climbing to about 117.4 percent for firms that do not use generators. It was therefore recommended that policies to increase output of electricity to stabilize the supply should be put in place these countries to boost both their productivity and sales.

Yakubu, Akeem, and Abubakar (2018) carried out a study on how electricity supply instability affects the output of small and medium scale enterprises in Kogi State. The work made use of a survey study and using both content validity and reliability of the instrument. The findings showed that an unreliable power supply generates increase in the operating cost of these business enterprises and therefore heightens the risk of business failure in these firms. The recommendation is for the government and stakeholders to craft policies that will ensure a delivery of alternative power supply that is capable of reducing the cost of production and improve the profitability of these firms. Similarly, Magongo and Sacolo (2018) studied the economic cost of power fluctuations in Eswatini, Swaziland. The work employed both direct and indirect cost method and using a binary logistic regression to estimate the coefficients, the findings showed that the industrial sector experienced the highest cost when compared with other sectors. The implication of this is that power outages increases the operating costs of the industries in this sector and that further weaken the profitability and long run productivity from this sector in the long run. The work therefore recommended that energy policies that could help to improve the generation of alternative energy sources should be designed to lower the cost of production and raise the standard of living.

Modi and Adamu (2016) examined how electricity supply affects the output of small and medium enterprises in Mubi. The work used primary data obtained by administering questionnaire and using regression analysis to estimate the parameters. The outcome of the analysis showed that electricity supply has a negative relationship with the performance of these firms. It was therefore recommended that these firms will do well in terms of higher productivity and growth if there is the provision of a more stable electric power supply. This study was

supported by the work of Nyanzu and Adarkwah (2016), who examined how electricity affects SMEs performance in two of the regions in Ghana. Data sourced from the World Bank were used consisting of 710 firms and employed chi-square and t-test for pattern analysis while using Ordinary Least Square regression method for the estimation. The findings similarly revealed that profitability of these firms were negatively affected by unstable power supply in the country especially those located in the northern area of the country. Recommendations includes investing in energy mix that will develop alternative sources of electricity supply and hence, improve on the productivity and efficiency of the firms

Ugwoke, Dike and Elekwa (2016) examined the relationship between firms' consumption of electricity and their production in Nigeria between 1980 and 2014. The work employed a double-log linear formation to estimate the parameters. The findings revealed that there exists a negative relationship between consumption of electricity and industrial production, although the parameters were not statistically significant. It was therefore recommended since the government could not fulfil their obligation of providing adequate electricity supply; there should be a policy of tax relief for firms that privately generate their own power. This work was corroborated by Mezghani and Hedi (2016) in their study on electricity consumption and economic growth in Saudi Arabia between 1971 and 2010. Their work employed the Time-varying parameters Vector Autoregressive (TVP-VAR) methodology for the analysis. The work showed that the model was suitable for the examination of the relationship between electricity consumption, real Gross Domestic Product and carbon emission. The study however discovered that the erratic electricity supply in the 1970s and 1980s must have affected the GDP negatively during that period. It was therefore recommended that policies to militate against such volatility of power supply should be designed to be able to stabilize the growth in GDP.

Gado and Obumneke (2015) conducted a study on the effects of electricity on the growth of Small and Medium Enterprises (SMEs) in Nigeria between 1990 and 2013. The work employed the methodology of Ordinary Least Squares (OLS) for the estimation of the parameters. The findings found that erratic power supply or fluctuations in electricity supply led to decline in SMEs growth. It was therefore recommended that Government should increase investment in power infrastructures and improve on the implementation of power distribution privatisation.

Enofe and Ishola (2014) examined the effect of public expenditure on electricity on economic and social activities in Nigeria between 1970 and 2011. The work employed the Error Correction Mechanism (ECM) to estimate the parameters. It was revealed in the result that government expenditure on electricity is positively related with socio-economic activities in the country. It was therefore recommended that government spending should be more targeted to boost electricity supply and consequently productivity in the country.

Braimah and Amponsah (2012) carried out a qualitative survey of the effects of frequent and unannounced electricity blackouts on the operations of Micro and Small Scale Industries (MSI) in the Kumasi metropolis of Ghana. A sample of 320 MSIs were chosen from three industrial clusters in Kumasi area. The observation was that power failure lasted for about an average of 10 hours 30 minutes in a month. This power failure was found to force about 44 percent of the sample size to unproductiveness while the remaining 56 percent had to rely on alternative power supply which on the average costs about Ghs15.5 to run per month. This consequently reduces the operation and productivity of the MSIs in the region. It was therefore recommended that policies should be crafted to address the factors that are responsible for the fluctuations to be able to stabilize the productivity of the firms in this area. Most of the works reviewed stopped their analysis in 2015 and that is a gap that this work intends to fill in Nigeria by updating the year scope. The works that are more updated are centred on state level analysis and this work will be using a national data to carry out its analysis.

Theoretical Framework

This study adopts the theory of Unbalanced Growth by Hirschman (1969). The theory postulates that economic development such as growth of micro, small, and medium enterprises can be accelerated through investment into key sectors of the economy such as power or electricity supply. The theory is based on the principles of inducement and pressures. It is the inducement or pressure generated by some initial investment that calls for subsequent investment in other activities or production. The rationale for the choice of this theory is premised on the following: Deliberate investment by government in the power sector (which represents Social Overhead cost) increases the capacity of the sector to supply electricity.

⇒ Supply of Electricity = $f(\text{Investment in Electricity})$

Consistent and adequate power supply leads to direct productive activities which directly affects the performance of the enterprises in terms of productivity

⇒ Productivity of firms = $f(\text{Electricity Supply})$.

Consistent and adequate power supply should positively influence the output and productivity of enterprises. Regular power supply reduces the cost of production of the SMEs and that increases their profitability.

MODEL SPECIFICATION

Following the works of Modi and Adamu (2016) where monthly turnover of small and medium enterprises was modelled to depend on power supply, number of employees, wages and salaries and the work of Gado and Obumneke (2015) where SME output as a percentage of GDP was modelled to depend on electricity power consumption, electricity supply, federal government expenditure on capital and recurrent expenditure, this study will adapt their approach to modelling the relationship among the variables of interest. The variables that will be used in this work to address the objective includes: Electricity supply in KV, Manufacturing output of the small and medium scale enterprises, Government expenditure on economic and social services, which is a proxy for expenditure on infrastructure. In addition to these, the work also considered exploring the influence of access to credit by small and medium scale enterprises, which is proxied by loan to Small and Medium scale enterprises. Therefore, the functional model is expressed as follows:

$$SMEQ_t = f(ES_t, GEI_t, LSME_t) \quad \dots \quad (1)$$

Where $SMEQ_t$ = Small and Medium Scale Enterprises output in time t, ES_t = Electricity Supply in time t, GEI_t = Government Expenditure on Infrastructure in time t, and $LSME_t$ = Loans to Small and Medium Scale enterprises in time t.

Model (1) can be re-expressed in econometric format for estimation:

$$SMEQ_t = \alpha_t + \beta_1 ES_t + \beta_2 GEI_t + \beta_3 LSME_t + \mu_t \quad \dots \quad (2)$$

A priori Expectations

The theoretical expectation of each of the parameters can be as stated below:

$\beta_1 > 0$, all things being equal. $\beta_2 > 0$, all things being equal, $\beta_3 > 0$

After the Unit root test on all the variables, it was found that all the variables were not stationary at level, but became stationary after first differenced. It was also confirmed that the variables were cointegrated using Johansen's cointegrating technique. The estimation technique that is suitable for this work shall therefore be Vector Error Correction model (VECM), which is specified below:

Vector Error Correction Model

The Vector Error Correction Model restricts the long run behaviour of the endogenous to converge to their cointegrating relationships while allowing for a short run adjustment. The cointegrating term is known as the error correction term since the deviation from the long run equilibrium is corrected gradually through a series of partial short run adjustments.

Given a three-variable case (y, x and z), the VECM can be specified as:

$$\Delta y_t = \alpha + \sum_{i=1}^{k-1} \beta_i \Delta y_{t-i} + \sum_{j=1}^{k-1} \delta_j \Delta x_{t-j} + \sum_{m=1}^{k-1} \theta_m \Delta z_{t-m} + \rho_1 ECT_{t-1} + e_{1t} \quad (3)$$

$$\Delta x_t = r + \sum_{i=1}^{k-1} \beta_i \Delta y_{t-i} + \sum_{j=1}^{k-1} \delta_j \Delta x_{t-j} + \sum_{m=1}^{k-1} \theta_m \Delta z_{t-m} + \rho_2 ECT_{t-1} + e_{2t} \quad (4)$$

$$\Delta z_t = \gamma + \sum_{i=1}^{k-1} \beta_i \Delta y_{t-i} + \sum_{j=1}^{k-1} \delta_j \Delta x_{t-j} + \sum_{m=1}^{k-1} \theta_m \Delta z_{t-m} + \rho_3 ECT_{t-1} + e_{3t} \quad (5)$$

Where: $k-1$ = the lag length and it is reduced by 1 because of the differencing, β_i , δ_j , θ_m = short run dynamic coefficients of the model's adjustment long run equilibrium.

ρ_1 = speed of adjustment parameter with a negative sign.

ECT_{t-1} = the error correction term, which is the lagged values of the residuals obtained from cointegrating regression of the dependent variable on the regressors. It contains long run information derived from the long run cointegrating relationships.

u_{it} = residuals or error terms referred to as impulses, shocks or innovations.

We can re-present the models above in a more compact format, where the dependent variable is expressed as a function of its lag and the lag of other variables in the system.

$$\Delta Y_t = \alpha + \sum_{i=1}^{k-1} \gamma_i \Delta Y_{t-i} + \sum_{j=1}^{k-1} \delta_j \Delta X_{t-j} + \sum_{m=1}^{k-1} \theta_m \Delta Z_{t-m} + \rho_1 ECT_{t-1} + u_t \quad (6)$$

$$\text{From equation (13), } ECT_{t-1} = [\gamma_i Y_{t-1} - \delta_j X_{t-1} - \theta_m Z_{t-1}] \quad \dots \quad (7)$$

= the lagged OLS residual obtained from the long run cointegrating equation:

$$Y_t = [Y_{t-1} - \delta_1 X_{t-1} - \theta_1 Z_{t-1}]$$

The ECT explains that previous period's deviation from long run equilibrium influences the short run movement in the dependent variable. ρ_1 = the coefficient of the ECT and represents the speed of adjustment. It measures the speed at which Y returns to equilibrium after changes in X and Z have occurred.

In this work, we have four variables, and they are presented as follows,

Where the Vector X_t is defined as follows:

$$X_t = f(SMEQ_t, ES_t, GEES_t, LSME_t) \quad (8)$$

The VECM model for this work is specified as follows:

$$\Delta SMEQ_t = \alpha + \sum_{i=1}^{k-1} \beta_i \Delta ES_{t-i} + \sum_{j=1}^{k-1} \delta_j \Delta GEES_{t-j} + \sum_{m=1}^{k-1} \theta_m \Delta LSME_{t-m} + \rho_1 ECT_{t-1} + u_{1t} \quad (9)$$

Where the variables are as defined in (1).

Nature and Sources of Data

The data for this work is a time series secondary data. The data include Electricity supply (ES), sourced from the National Bureau of Statistics (NBS), Small and Medium Scale manufacturing output (SMEQ), sourced from NBS, Government Expenditure on Economic and Social Services (GEES), sourced from NBS, Loans to Small and Medium Scale enterprises (LSME), sourced from Central Bank Statistical Bulletin.

Presentation and analysis of Results

Unit Root Test

Table 5.1 shows the results of the Unit root test for the variables. It showed that all the variables have unit root at level (with the probability values higher than 5 percent level of significance), but when differenced once, they became stationary. This is indicated by the Probability values of all the variables less than 5 percent after first differenced. This implies that all of them are integrated of order one. This is the condition that enables us to go for cointegration using Johanson's cointegration technique.

Table 5.1: Unit Root Test

Unit Root Test using Augmented Dickey-Fuller test									
	At Level			At First Difference					
Variables	ADF Statistics	t-Value	5% level	Prob. Value	ADF Statistics	t-Value	5% level	Prob. Value	Order of Integration
SMEQ	0.1495		0.1495	0.9647	-3.0026		-3.0026	0.0453	I(1)
ES	-0.3136		-0.3136	0.9123	-4.5902		-4.5902	0.0009	I(1)
GEES	-1.3001		-1.3001	0.6177	-7.5314		-7.5314	0.0000	I(1)
LSME	-0.4468		-0.4468	0.8886	-4.7496		-4.7496	0.0006	I(1)

Source: Computed by the author using eviews 10

Cointegration Test

The result of the cointegration tests are displayed in table 5.2. The results showed that there is at least one cointegration model among the variables indicated by the probability value of both the Trace test and Max-Eigen test results which are 0.0138 and 0.0112 respectively. Another way it can be pointed out is when the Trace and the Max-Eigen statistics are higher than the 5 percent critical values. The implication of this result is that there is a long run relationship among the variables.

Table 5.2: Cointegration test using Johansen test method

	Trace Test			Max-Eigen Test		
H_0	Trace Statistic	5% Critical Value	P-Value.	Max-Eigen Statistic	5% Critical Value	P-Value
None *	53.39950	47.85613	0.0138	32.36433	27.58434	0.0112
At most 1	21.03517	29.79707	0.3554	11.22760	21.13162	0.6246
At most 2	9.807565	15.49471	0.2958	9.789584	14.26460	0.2261
At most 3	0.017982	3.841466	0.8932	0.017982	3.841466	0.8932

Source: Computed by the author using eviews 10

Optimal Lag Selection

As a result of both the unit root and cointegration test results indicating a cointegrating model, a vector error correction model has to be estimated. That means that there will be a correction to the past disequilibrium in the

long run. But an optimum lag length must be selected using the selection criteria. Out of the five selection criteria, three of them suggested lag 2 and two chose lag 1. The choice that has the highest was then picked as lag 2.

Vector Error Correction Model

After the choice of appropriate lag length, the Vector Error Correction was then estimated following the model specified in (9) as displayed in table 5.3.

Table 5.3: Vector Error Correction Model
Dependent Variable: SMEQ

Variables	Coefficient	Std. Error	t-Statistic	Prob.	
ECT(-1)	-0.15097	0.05061	-2.98296	0.0071	
D(SMEQ(-1))	-0.12493	0.230143	-0.54283	0.593	
D(SMEQ(-2))	0.42045	0.224508	1.872761	0.0751	
D(ES(-1))	3.768724	2.40503	1.567018	0.1321	
D(ES(-2))	4.254286	2.34994	1.81038	0.0846	
D(GEES(-1))	1.264584	0.524369	2.411627	0.0251	
D(GEES(-2))	0.302314	0.650713	0.464589	0.647	
D(LSME(-1))	-74.2821	29.24671	-2.53985	0.0191	
D(LSME(-2))	-53.5703	36.54771	-1.46576	0.1575	
C	135.8707	67.35718	2.017168	0.0566	
R-squared		0.67802		F-statistic	4.913483
Adjusted R-squared		0.540028		Prob. (F-statistic)	0.001273
Durbin-Watson stat			2.048807		

Source: Computed by the author using *eviews 10*

Long run relationship and causality

The first on the list of variables in table 5.3 is the Error Correction term which is negative (correctly signed) and it is significant with a probability value of 0.0071 or 0.07 percent, which is less than 5 percent. That shows that there is a long run relationship among the variables and the error correction term is (ECT) is significant. The coefficient of ECT denotes the speed at which any deviation from past equilibrium will be adjusted in the long run. It shows the long run causality running from the independent variables to the dependent variable. The coefficient shows the speed of adjustment of 15 percent per annum.

Short run relationship and causality

The lagged values of the variables show the short run relationship with the dependent variable. The coefficients of lags one and two of Electricity supply are positive, which means that more supply of electricity generates more SME output but the coefficients are not individually significant. However, when the joint coefficients are tested using Wald test, the lags one and two of electricity supply are significant in affecting SME output. Their joint significance shows that there is causality running from Electricity supply to SME output.

The next variable is the Government Expenditure on Economic Services lags one and two. The coefficients are positive and properly signed. That indicates that GEES positively influences SME output. Lag 1 of GEES is significant in explaining the performance of SME output with probability value of 0.0251. When the two lags are tested with Wald test, they are both significant. The joint significance indicates that there is causality running from GEES lags one and two to SME output.

Granger Causality

The Granger causality test is also used to determine short run causality among variables. The results are presented in table 4.5. Individual variables have Granger causal effect on SME output and they all have joint causal effect on SME output, with the probability values less than 5 percent.

Decision rule: If the probability value of any of the coefficients is less than 5%, we reject the null hypothesis that there is no causality running from the variable to the dependent variable. These results agree with the Wald test conducted on the coefficients. The result is table 5.4 showed that electricity supply, government expenditure on economic and social services and loans to SMEs can Granger cause SME output in Nigeria.

Table 5.4: Granger causality

Dependent variable: D(SMEQ)			
Excluded	Chi-sq	df	Prob.
D(ES)	7.598407	2	0.0224
D(GEES)	5.996429	2	0.0499
D(LSME)	6.809262	2	0.0332
All	17.35195	6	0.0081

Source: Computed by the author using eviews 10

It has been revealed that the independent variables have short run significant effect and causality on the dependent variable. The implications include possibility of altering the SME output in the short run by adjusting the independent variables. This finding agrees with the work of Modi and Adamu (2016) and Gado and Obumneke (2015) that showed that if SME output is to be improved, electricity supply must be increased and outages must decline.

Residual Diagnostic Tests

The residuals of the variables were subjected to some diagnostics, such as Seral Correlation, Normality and Heteroscedasticity as shown in table 5.5.

Table 5.5: Residual Diagnostics	
Type of Test	Chi sq P-value
VEC Residual Serial Correlation LM Tests	0.1023
VEC Residual Normality Tests Jarque-Bera	0.1160
VEC Residual Heteroskedasticity Tests (Levels and Squares)	0.0404

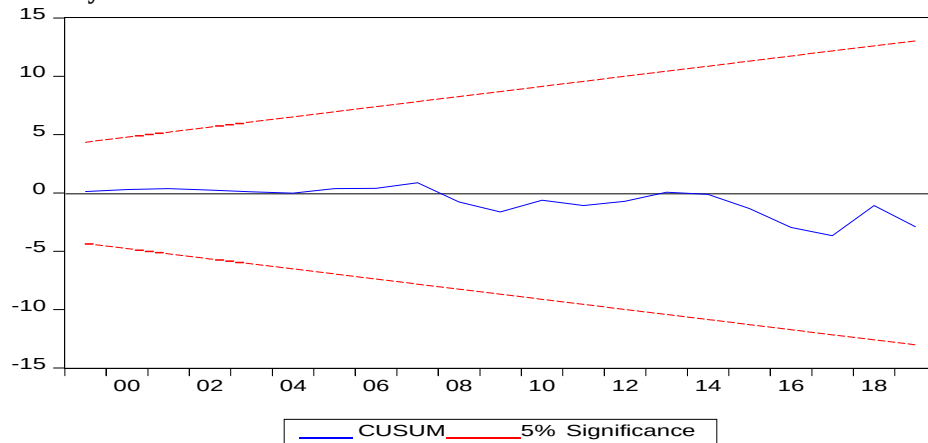
Source: Computed by the author using eviews 10

The serial correlation and normality tests have their probability values less than 5 percent, and so we reject the null hypotheses of presence of autocorrelation and no normal distribution among the residuals. The only problem here is that the residuals do not have constant variance, they are heteroscedastic.

Stability test

The model was also tested for stability using Cusum Test as shown in figure 5.1. The model is stable seeing that it lies within the 5 percent significance levels. That implies that the model is good for prediction and forecast.

Figure 5.1: Stability test



Source: Computed by the author using eviews 10

The findings of this work have, therefore, been seen to have satisfied majority of econometric and statistical requirements for a model to be useful for policy analysis.

SUMMARY AND POLICY RECOMMENDATIONS

This study examined the effect of electricity supply on small and medium enterprises in Nigeria and the study has shown that electricity supply in Nigeria has a direct relationship with SMEs output and SMEs output can be Granger caused by electricity supply. Government expenditure on economic services, which is a proxy for public expenditure on infrastructure also positively affects SMEs output and can also Granger cause it.

It is therefore recommended that:

- i. There is a need for policy makers to quickly design policies that will tackle the generation of electricity, liberalise the sector more for private enterprises that have the capacity to operate at that level.
- ii. There is the need to further liberalise the transmission phase of the electricity supply chain so as to make the little supply gets to the consumers so as to reduce electricity loss in transmission.
- iii. The distribution phase of the supply chain is another major setback in the supply of electricity. There is a need to further liberalise the section of the supply chain to avoid regional monopoly of the distribution companies.
- iv. Government expenditure on infrastructure needs to be further beefed up especially on electricity infrastructure. The transmission phase been handled by the government is not enough. There is need to change the entire electricity infrastructure such as cables, poles, and transformers.

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IMPACT OF NATIONAL HEALTH INSURANCE SCHEME (NHIS) ON EMPLOYEES' PRODUCTIVITY IN ADAMAWA STATE, NIGERIA

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Abstract

This study assessed the impact of the National Health Insurance Scheme (NHIS) on employee productivity. The study utilized data from the Federal College of Education (FCE) Yola, and American University of Nigeria (AUN) using a structured questionnaire. A sample of 200 respondents was drawn from the two institutions. Count data models were used to examine the effects of the benefits offered by NHIS on the productivity of workers. The findings from this study reveals that awareness and prevention campaign, drug quality, health treatment and dental care service reduce the probability of a worker falling sick and missing work days. The result shows 61% of workers who are insured have never missed work due to sickness in the last 12 months. The study recommends that, the services offered by the NHIS should be more strengthened and sustained since they are found to be impacting much on workers. Thus, proper monitoring and supervision of the programme are important to ensure that the goal of the scheme is attained. Awareness and prevention campaigns should be conducted at regular intervals to bridge the information asymmetric among individuals. When workers are enlightened and informed about certain diseases, for example, diabetes, blood pressure, cancer, etc. They will be able to take both preventive and curative measures. Health treatment should also be improved at the various healthcare centers enrolled in NHIS scheme to ensure that there is efficiency and effectiveness in the treatment given to the beneficiaries.

Keywords: Productivity, Health Insurance, NHIS

INTRODUCTION

Public and private organizations have been marred with health related problems of their employees. The associated problems can be viewed in terms of disability claims, hospitalization, absenteeism and lack of concentration in the work place due to sickness of self or of a family member, low morale and poor public relations among colleagues. This study aims at assessing the impact of national health insurance scheme on employees' productivity in Nigeria

National health insurance scheme (NHIS) is a social and security health care scheme designed to provide comprehensive healthcare delivery at affordable costs, covering employees of the formal and informal sectors, as well as the self-employed, rural communities, the poor and the vulnerable. It's a health care system in which the healthcare of an employee is paid for by both the employer and the employee.

The term „productivity“ means different things to different persons. As a phenomenon, it ranges from efficiency to effectiveness, to rates of turnover and absenteeism, to output measures, to measure of client or consumer satisfaction and, to intangibles, such as disruption in workflow and to further intangibles, such as morale, loyalty and job satisfaction. The least controversial definition of productivity, however, is the quantitative relationship between output and input (Antle & Capalbo, 1988; and Iyaniwura & Osoba, 1983).

Berger and Messer (2002) viewed that health is a form of capital, such that health care is both a consumption good that yields direct satisfaction and an investment good that yields indirect utility through increased productivity, fewer sick days and higher wages. This individual increase in output can translate into increases in

labor productivity. An increase in an individual's stock of health raises his productivity in both market and non-market activities.

Moreover, most of the studies carried out on the impact of health insurance on employee productivity were carried out in the developed countries, and research in this area received limited attention in Nigeria. This implies that there is a major gap on the relevant literature in developing countries, particularly Nigeria. The motivation for this study is therefore, to fill this gap by studying the situation in Nigeria and providing the evidence on the impacts of health and health insurance on employee productivity, taking the health care services provided by NHIS specifically, using models that are adequate to capture the effects of health insurance on employees' productivity.

LITERATURE REVIEW

Conceptual Literature

The Concept of Productivity

The definition of productivity is complex. This is because it is both a technical and managerial concept. Productivity is an overall measure of the ability to produce a good or service. More specifically, it is a measure of how specified resources are managed to accomplish timely objectives as stated in terms of quantity. Productivity may also be defined as an index that measures output (goods and services) relative to the input (labour, materials, energy, etc, used to produce the output). Productivity in industry is usually defined as the manufacturing output compared with an input. Output from the production process is compared with a chosen input and is usually expressed either as a ratio or percentage (Ronald, 2009).

Productivity is useful as a relative measure of the actual output of production compared to the actual input of resources measured across time or against common entities. As output increases for a level of input or as the amount of input decreases for a constant level of output, an increase in productivity occurs. Therefore, a "productivity measure" describes how well the resources of an organization are being used to produce input.

Types of Productivity Measures

a. Single Factor Productivity (SFP)

Single factor productivity (SFP) is defined as the ratio of a measure of out-put quantity to the quantity of a single input used. That is, a measurement of productivity that is a ratio of output and one input factor. A most well-known measure of single-factor productivity is the measure of output per work input, describing work productivity. Sometimes it is practical to employ the value added as output. Productivity measured in this way is called value-added productivity.

b. Labour Productivity (LP)

Labour productivity (LP) is defined as the ratio of a measure of output quantity to some measure of the quantity of the labour used, such as the total hours worked. Labour productivity is the amount of goods and services that a worker produces in a given amount of time. It is one of several types of productivity that economists measure. Labour productivity often referred to as workforce productivity, is a measure for an organization or company, a process, an industry, or a country. Workforce productivity is to be distinguished from employee productivity, which is a measure employed at individual level based on the assumption that the overall productivity can be broken down to increasingly smaller units until ultimately to the individual employee in order be used, for example for the purpose of allocating a benefit or sanction based on individual performance.

c. Total Factor Productivity (TFP)

Total factor productivity (TFP) is defined as the ratio of a measure of total output quantity to a measure of the quantity of total input. It is a variable which accounts for the effects in total output growth relative to the growth in traditionally measured inputs of labor and capital. If all inputs are accounted for, total factor productivity (TFP) can be taken as a measure of an economy's long-term technological change or technological dynamism. TFP cannot be measured directly. Instead, it is a residual, often called the Solow residual, which accounts for the effects in total output not caused by inputs.

Concept of National Health Insurance Scheme (NHIS)

The National health insurance scheme (NHIS) was established under Act 35 of 1999 by the Federal Government of Nigeria. The Scheme was officially launched on 6th June, 2005 and commencement of services to enrollees started in September 2005. The scheme is aimed at providing easy access to healthcare for all Nigerians at an affordable cost through various prepayment systems. NHIS is totally committed to securing universal coverage

and access to adequate and affordable healthcare in order to improve the health status of Nigerians, especially for those participating in the various programmes/products of the Scheme.

How National Health Insurance Scheme (NHIS) Works

An employer registers itself and its employee with the Scheme. Thereafter, the employer affiliates itself with an NHIS-approved Health Maintenance Organization, who now provides the employees with a list of NHIS-approved Health Care Providers (public and private). The employee registers him/herself and dependents with such Provider of his/her choice.

Upon registration, a contributor will be issued an identity card with a personal identification number (PIN). In the event of sickness, the contributor presents his/her identity card to his/her chosen Health Care Provider for treatment. A contributor has the right to change his/her Health Care Provider after a minimum period of three (3) months, if he/she is not satisfied with the services being given.

The Health Maintenance Organization (HMO) will make payment for services rendered to a contributor to the Health Care Provider. A contributor may, however, be asked to make a small co-payment (where applicable) at the point of service. Health Care Providers under this Scheme will either be paid by capitation or fee-for-service or per diem or case payment.

1. Capitation

This is payment to a Health Care Provider by the HMOs, on behalf of a contributor, for services rendered by the Provider. This payment is made regularly in advance for the services to be rendered

2. Fee-for-Service

The HMO makes this payment to non-capitation-receiving Health Care Providers, who render services on referral from other approved Providers.

3. Per Diem

Per diem fees are payments for services and expenses per day (medical treatment, drugs, consumables, admission fees, etc.) during hospitalization.

4. Case Payment

This method is based on a single case rather than on a treatment act. A Provider gets paid for every case handled till the end, (National Health Insurance Scheme, 2010).

Empirical Literature

Several studies have been conducted to evaluate the relationship between health insurance and employees' productivity. Michael (2010) examined the perceived impact of NHIS on registered workers in federal polytechnic Idah. The result showed health security and insurance is an important measure of enhancing productivity in both private and public organizations. A healthy workforce makes a productive workplace.

Katsuru et al. (2010) sought to assess the impact of occupational health safety (OHS) on productivity in commercial food industry employing primary data and using simple percentage. The study shows an occupational health related problem negatively affects workers productive capacity in the food industry, resulting to reduced worker output. Workers exhibit negative attitude and low morale towards work.

Umoru and Yaqub (2013) analyzed the labour productivity effects of health capital in Nigeria, using GMM methodology and cointegration. In his study, result showed health capital investment is a significant determinant of labour productivity in Nigeria. Health capital investment enhances productivity of labour force.

Pedersen and Skagen (2014) explored the determinant of productivity loss and the work performance for employees with presenteeism employing binary choice and count models. The result showed presenteeism does not lead to either postponing task or letting others take over. Most those experiencing presenteeism are found at scale of work with much worse performance. It also showed work performance declines with worsening health status and employees who have had a sickness absence perform better.

Dey and Flinn (2000) used an equilibrium model of wage and health insurance to examine the effects of employer-provided health insurance on job mobility rates and economic welfare. The result revealed jobs that do provide health insurance last almost five times longer than jobs that do not provide health insurance, and the mobility rate for jobs without health insurance is significantly higher than the mobility rate for jobs with health insurance. It's also showed that health insurance enhances welfare and productivity. While decreasing health insurance premium paid by employees increases the steady state health insurance coverage rate.

Fahima (1995) examined the effects of nutrition and health on labour productivity for women and men workers on the subsistence farm household and found out that an increase in caloric consumption increased the female labour productivity but health, as measured by weight for height of the female workers, was not significant. And caloric consumption of the male worker did not contribute to their productivity but their health, as measured by weight-for-height significantly added to the value of output.

Theoretical Framework

The Human Capital Theory

According to human capital theory increases in a person's stock of health and knowledge or human capital raise his productivity in the market sector of the economy, where he produces money earnings and in the nonmarket or household sector, where he produces commodities that enter his utility function. To realize potential gains in productivity, individuals have an incentive to invest in formal schooling and on-the-job training. The costs of these investments include direct outlays on market goods and the opportunity cost of the time that must be withdrawn from competing uses. This framework was used by Ben-Porath (1967) to develop models that determine the optimal quantity of investment in human capital at any age. In addition, these models show how the optimal quantity varies over the life cycle of an individual and among individuals of the same age. The model views health as a durable capital stock that yields an output of healthy time. Individuals inherit an initial amount of this stock that depreciates with age and can be increased by investment.

The approach uses the household production function model of consumer behavior (Lancaster, 1966; & Michael and Becker, 1973) to account for the gap between health as an output and medical care as one of many inputs into its production. This model draws a sharp distinction between fundamental objects of choice--called commodities--that enter the utility function and market goods and services.

METHODOLOGY

This study adopted a survey research design using a well-structured questionnaire administered. The targeted population for this study consists of the academic and non-academic staff of American University of Nigeria (AUN) and Federal College of Education (FCE), Yola in Adamawa State, Nigeria. A total number of 200 workers were selected, 100 from AUN and 100 from FCE, Yola. This sample selection was made using stratified sampling technique for effective coverage and complete representation. Non-probability sampling technique was used to select the two corporations for effective coverage and complete representation. Krejcie and Morgan 1970 sample determination table was used to arrive at the sample size.

The variables used in this study were developed based on the work of Dizioli and Pinheiro (2012) with some modification and adjustment on their measurement.

Model Specification

The study employed the use of count data models; Poisson regression and negative binomial models.

Poisson Regression Model

Poisson is the starting point for count data analysis, though it is often inadequate. The natural stochastic model for counts is a Poisson point process for the occurrence of the event of interest. The canonical regression specification for a variable Y that is a count of events is the Poisson regression,

$$\text{Prob}[Y = y_i | x_i] = \frac{\exp(-\lambda_i) \lambda_i^{y_i}}{y_i!} \quad (1)$$

$$\lambda_i = \exp(\alpha + x_i'\beta), y_i = 0, 1, \dots, i = 1, \dots, N \quad (2)$$

Where x_i is a vector of covariates and, $i = 1, \dots, N$, indexes the N observations in a random sample. The significant features of the Poisson model are its log linear conditional mean function

$$E[y_i | x_i] = \lambda_i \quad (3)$$

and its equi-dispersion,

$$\text{Var}[y_i | x_i] = \lambda_i \quad (4)$$

The distribution that is characterized with these parameters is said to have poisson probability distribution.

Standard Negative Binomial Distribution Model

The negative binomial model is employed as a functional form that relaxes the equi-dispersion restriction of the Poisson model. A useful way to motivate the model is through the introduction of latent heterogeneity in the conditional mean of the Poisson model. Thus, we write

$$E[y_i | x_i, s_i] = \exp(\alpha + x_i'\beta + s_i) = h_i \lambda_i \quad (5)$$

Where $h_i = \exp(\varepsilon_i)$ is assumed to have a one parameter gamma distribution, $G(\theta, \theta)$ with mean 1 and variance $1/\theta = \kappa_i$

$$f(h_i) = \frac{\theta^\theta \exp(-\theta h_i) h_i^{\theta-1}}{\Gamma(\theta)}, h_i \geq 0, \theta > 0 \dots\dots\dots 6$$

After integrating h_i out of the joint distribution, we obtain the marginal negative binomial (NB) distribution

$$\text{Prob}[Y = y_i | x_i] = \frac{\Gamma(\theta + y_i) \theta^\theta (1 - \theta)^{y_i}}{\Gamma(1 + y_i) \Gamma(\theta)} \dots\dots\dots 7$$

$$y_i = 0, 1, \dots, \theta > 0, \quad r_i = \theta / (\theta + \lambda_i) \dots\dots\dots 8$$

The latent heterogeneity induces over dispersion while preserving the conditional mean;

$$E[y_i | x_i] = \lambda_i \dots\dots\dots 9$$

$$\text{Var}[y_i | x_i] = \lambda_i [1 + (1/\theta)\lambda_i] = \lambda_i [1 + \kappa \lambda_i] \dots\dots\dots 10$$

$$\text{Where } \kappa = \text{Var}[h_i]$$

The study utilizes negative binomial model as a check against poor performance of the Poisson model to appropriately describe the count dependent variable. However, it adopts the two forms of negative binomial model, the negative binomial 1 and negative binomial 2.

It must be mentioned that the two forms of negative binomial differ only on the distribution they are following. They are used here to achieve a robust result in the study.

The density function for the negative binomial 1 (NB-1) model is given by

$$\Pr[Y = m | \gamma, \lambda] = \frac{\Gamma(m+1) \Gamma(\gamma)}{\Gamma(\gamma) \Gamma(m+1)} \left\{ \frac{\lambda}{\lambda + \gamma} \right\}^m \left\{ \frac{\gamma}{\lambda + \gamma} \right\} \dots\dots\dots 11$$

$$\text{Where } \lambda_i = \exp(x_i' \beta)$$

and the precision parameter is given by

$$\gamma_i = (1/\alpha)\lambda$$

Where α is an over dispersion parameter. As a result of this specification, we have:

$$E(y_i | x_i) = \lambda_i$$

and

$$V(y_i | x_i) = \lambda_i (1 + \alpha)$$

This model is called negative binomial-1 (NB1) model.

On the other hand, Negative binomial regression can be considered a generalization of Poisson regression and assumes that the conditional mean U_i of Y_i is not only determined by X_i but also a heterogeneity component e_i unrelated to X_i . The formulation can be expressed as

$$u_i = \text{Exp}(X_i \beta + e_i) = \text{Exp}(X_i \beta) \text{Exp}(e_i) \dots\dots\dots 12$$

Where, $\text{Exp}(e_i) \sim \text{Gamma}(\alpha^{-1}, \alpha^{-1})$

As a result, the density function of Y_i can be derived as

$$f(Y_i | X_i) = \frac{\Gamma(F_i + \alpha^{-1})}{\Gamma(F_i + 1) \Gamma(\alpha^{-1})} \left\{ \frac{\alpha^{-1}}{\alpha^{-1} + u_i} \right\}^{\alpha^{-1}} \left\{ \frac{u_i}{\alpha^{-1} + u_i} \right\}^{F_i} \dots\dots\dots 13$$

and the corresponding log likelihood function becomes

$$LL = \sum_{i=1}^n \left\{ \log \left[\frac{\Gamma(F_i + \alpha^{-1})}{\Gamma(F_i + 1) \Gamma(\alpha^{-1})} \right] - (Y_i + \alpha^{-1}) \log(1 + \alpha u_i) + \log(\alpha u_i) \right\} \dots\dots\dots 14$$

Therefore, the negative binomial model follows the Likelihood ratio where the estimators are obtained by maximizing the objective function of the distribution.

However, the empirical model is thus specifies as; productivity (proxied by days absence from work due to sickness) as a function of NHIS services. That's,

$$ABS = f(HI, DQ, AP, HS, HT, MC) \dots\dots\dots 15$$

Equation for estimation:-

$$ABS = \theta_0 + \theta_1 DQ + \theta_2 AP + \theta_3 H + \theta_4 HT + \theta_5 DCS + \mu \dots\dots\dots 16$$

Where

μ is the random error term.

ABS = Day's absence due to sickness

DQ = Quality of drugs

AP = Awareness and prevention campaign

HS = Regular health screening services

HT = Health treatment

DCS = Dental care services

More compactly, equation 16 can be represented as

$$y = \alpha + x' \beta + u \dots\dots\dots 17$$

Where x_i is a vector of covariates and, $i = 1, \dots, N$, indexes the N

The expected sign of the coefficients of the parameters of the model can also be explained as

$\theta_1, \theta_2, \theta_3, \theta_4$, and θ_5 are all expected to have a negative relationship with the number of days missed work due to sickness.

RESULTS AND DISCUSSION

Table 1: Poisson Model, Negative Binomial Model and Marginal effects

<i>Days absence</i>	<i>Poisson Model b/se/p</i>	<i>Poisson Marginal Effects b/se/p</i>	<i>Negative Binomial Model b/se/p</i>	<i>Negative binomial marginal effects b/se/p</i>
<i>Awareness & prevention camp</i>	-0.181 (0.098) 0.065	-.547 (0.293) 0.062	-0.372 (0.446) 0.405	-1.102 (1.315) 0.402
<i>Drug quality</i>	-0.123** (0.044) 0.005	-.377** (0.133) 0.005	-0.127 (0.164) 0.439	-.384 (0.501) 0.443
<i>Health treatment</i>	-0.005 (0.040) 0.908	-.014 (0.121) 0.908	-0.000 (0.151) 0.998	-.001 (0.457) 0.998
<i>Dental care services</i>	-0.112** (0.040) 0.005	-.342** (0.121) 0.005	-0.172 (0.160) 0.281	-.521 (0.49) 0.289
<i>Health screening</i>	0.190 (0.112) 0.091	.615 (0.383) 0.108	0.303 (0.507) 0.550	1.001 (1.834) 0.585
<i>Lnalpha Constant</i>	1.883*** (0.161) 0.000		2.143** (0.743) 0.004	
<i>R-squared N</i>			1.516*** (0.172) 0.000	

Source: Author Survey (2015)

Table 1 depicts the estimated results for the Poisson model, negative binomial model and their marginal effects respectively. From the Table, workers who hold insurance and have awareness and prevention campaigns are expected to have a reduced probability of missing work days due to sickness with 18% (37%). The probability is higher in the negative binomial than in the Poisson model. Looking at the marginal effects, it shows a one-day program of awareness and prevention campaign on diseases is associated with a 55% (1%) decrease in the number of missing work-days due to sickness.

The probability that a worker will miss work days falls by 12% (13%) when good quality drugs are provided. For the marginal effects, it implies that any additional quality drug given to a worker is associated with 37% (38%) reduction in day's absence due to sickness. Drug quality is statistically significant at the 5% level of significance for the Poisson, but statistically insignificant in the negative binomial at all levels.

Similarly, the probability that a worker will remain on admission and miss work days falls by 46% (32%). This means the probabilities are relatively high in both the two models. For the marginal effects, it shows a single health treatment offered to an individual during admission is associated with 14% (1%) reduction in day's absence due to sickness. The

Individuals who receive dental care service are expected to have a reduced probability of missing work days as a result of dental problems by 11% (17%). Looking at the marginal effects, it implies that every dental care service provided is associated with 3% (5%) decrease in missing work days.

However, missing work days increase by 19% (2.1%) when an individual is medically screened. From the marginal effects, it implies that a single health screening is associated with 11% (58%) increased number of

missing work days. This is not consistent with the a priori expectation of the model, because we expect a worker to get healthier when he/she is medically screened and is able to detect health problems at their early stages. However, this could be as a result of psychological problems that individuals may encounter when they get to know about their health problems. Statistically, health screening is insignificant at all levels of significance in both the models. When all the regressors are held constant, day's absence is expected to increase by 1.9% (2.1%).

However, the findings of this study corroborate that of Abiola (2011) which revealed a positive relationship between healths related programmes and employees' productivity in Nigeria.

Post-estimation Tests

Over-dispersion Test

Table 2: Over dispersion test for Poisson Model

<i>Ystar</i>	Coefficient	<i>Std.err.</i>	T	p>/t/	[95% conf. interval
<i>Muhat</i>	-.474	.015	-31.25	0.000	-.504 -.444

Source: Author's Survey (2015)

Table 2 presents over dispersion test for the poisson model because of its assumption of equi-dispersion and thus reports the statistics for the test. It can be inferred that the null hypothesis of equi-dispersion is rejected at all the levels of significance. Alternatively, the negative binomial model is likely to capture the data generating process more appropriately than the Poisson model.

Endogeneity Test for Poisson and Negative Binomial Models

Most of the coefficient in the Poisson and negative binomial estimations tend to be insignificant; this could be as a result of an endogeneity problem. Thus, they are subjected to the endogeneity test. The test is going to be a two-step procedure. The first step is to see the degree of correlation between the variables, which indicates the severity of the endogeneity problem and the second step is to correct the endogeneity problem that might arise. Thus, Tables 3 and 4 below depict the correlation matrix of the variables in the study.

Table 3: Correlation Matrix for Poisson Regressors

	<i>Awareness & prev.campaign</i>	<i>Drug quality</i>	<i>Health-treatment</i>	<i>Dental-care service</i>	<i>Health-screening</i>
<i>Awareness & prev. campaign</i>	1.0000				
<i>Drug quality</i>	-0.1645	1.0000			
<i>Health-treatment</i>	-0.1758	0.3135	1.0000		
<i>Dental-care service</i>	-0.2423	0.3091	0.5966	1.000	
<i>Health-screening</i>	0.3131	-0.1619	-0.3188	-0.3188	1.000

Source: Author's Survey (2015)

Table 3 depicts the correlation test for the explanatory variables in the Poisson model. From the Table the variable seems to be correlated. This may be as a result of the endogeneity among the variables. The test is conducted to correct the problem and obtain optimal parameters.

Table 4: Correlation Matrix for Negative Binomial Regressors

	<i>Awareness &prev.campaign</i>	<i>Drug quality</i>	<i>Health-treatment</i>	<i>Dental-care service</i>	<i>Health-screening</i>
<i>Awareness &prev.campaign</i>	1.0000				
<i>Drug quality</i>	-0.1645	1.0000			
<i>Health-treatment</i>	-0.1758	0.3135	1.0000		

Dental-care service	-0.2423	0.3091	0.5966	1.000	
Health-screening	0.3131	-0.1619	-0.3188	-0.3194	1.000

Source: Author's Survey (2015)

Table 4 depicts the correlation test for the explanatory variables in the negative binomial model. All the variables seem to be correlated. Thus, they are corrected as presented in the next Table.

Table 5: Endogeneity test for poisson model

Variables	Health treatment/ health screening	Dental care/drug quality	Drug quality/health treatment	Health screening/ Awareness &prev. campaign	Awareness & prev. camp. /Health screening
Chi2(2) Prob> chi2	445.86 0.0000	104.33 0.0000	2.03 0.3620	65.89 0.0000	83.31 0.0000

Source: field work 2015, computed by Stata 11

The variables are constructed based on the pairing of their correlation coefficient. From the Table 5 above, all the variables become statistically significant at all the levels of significance except the pairing of drug quality and health treatment. These variables that are found to be significant after correcting for the endogeneity problem can now be used for statistical inference.

Table 6: Endogeneity Test for Negative Binomial Model

Variables	Dental care/health treatment	Drug quality/health treatment	Awareness & prev. camp. /Health screening	Health treatment/ awareness & prev. camp.	Health Screening/ Drug quality
Chi2(2) Prob> chi2	0.32 0.8528	0.17 0.9186	7.65 0.0218	97.19 0.0000	2.91 0.2332

Source: Author's Survey (2015)

From the Table 6 above, health treatment versus awareness and prevention campaign and awareness and prevention campaign versus health screening are significant while dental care service versus health treatment, drug quality versus health treatment and health screening versus drug quality are not statistically significant.

The estimates from the two models have been corrected by addressing the problem of endogeneity attributed to the variables used in the study. Thus, it implies that we can estimate other statistics, such as marginal effects, incidence rate ratio (irr) and predicted probabilities that are useful for the analysis.

Table 7: Incidence Rate Ratio for Poisson and Negative Binomial Model

Days absence	Incidence rate ratio For poisson model	Incidence rate ratio for negative binomial model
Awareness & Prevention Campaign	.834 0.065	.689 0.405
Drug quality	.884 0.005	.880 0.439
Health treatment	.995 0.908	.999 0.998
Dental care Services	.894 0.005	.841 0.281
Health screening	1.209 0.091	1.354 0.550
Constant		
Pseudo R2	-623	-306
LL ratio	0.028	0.005

Source: Author's Survey (2015)

Table 7 depicts the incidence rate ratios for Poisson and negative binomial models. From the Table it can be seen that the incidence rate ratio for awareness and prevention campaign is computed to be 0.834 (0.689). When the figures are approximated to 1, it implies for every awareness and prevention campaign program conducted the chance of a worker coming to work because he/she is not sick is 1. Thus, the ratio of awareness and prevention campaign program is approximately 1:1

Similarly, the incidence rate ratio for drug quality is computed to be 0.884 (0.880). When approximated to 1, it means for every quality drug given, the chances of a worker coming to work is 1. Thus, the ratio for drug quality to days absence is 1:1

For health treatment, the incidence rate ratio is 0.99 (0.99). This shows for every health treatment provided, the chances of a worker coming to work is 1. Therefore, the ratio of health treatment to days absence is 1:1. Equally, the incidence rate ratio for dental care is computed to be 0.894 (0.841). This implies that for every dental care service offered, the chance of a worker not missing work is approximately 1. Thus the ratio of dental care service to days absence is 1:1. The incidence rate ratio for health screening is 1.209 (1.354). This means for every health screening conducted, the chance of a worker not missing work is 2. Therefore, the ratio of health screening to days absence is 1:2.

CONCLUSIONS

The existence of a vibrant and sound health sector is necessary for economic growth and sustained development. An effective health sector guarantees a sound and healthy workforce. A sound health care is one of the major ingredients for productivity. The provision of effective health care services that are affordable and accessible to workers had always been challenging prior to the implementation of the insurance scheme. The establishment of a health insurance scheme by the government has brought improvement in the health and livelihood of workers and their families.

Health insurance has an impact on the probability that a worker gets sick, misses workdays due to sickness, as well as the probability that he recovers and gets back to work. In recent times, many organizations are offering health related services to compliment the welfare of their workers. Empirical evidence from our study shows 61% of workers who hold insurance have never missed work days due to sickness in the last 12 months. However, the scheme need to be more effective and improve on some of its services, especially health screening. Other benefits proposed by the scheme are still not available in some health care centers.

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NEXUS BETWEEN FOREIGN DIRECT INVESTMENT, TRADE OPENNESS AND ECONOMIC GROWTH IN NIGERIA FOR THE PERIOD OF 1974 – 2020.

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Abstract

This research investigated the nexus between Foreign Direct Investment, Trade Openness and economic growth in Nigeria for the period 1974-2020. The regressions results showed that the goodness of fit is satisfactory (Adj. R-squared = 0.8), implying that the regressors in the model explain about 80% of the variations in the gross domestic product during 1974-2020. In the short run only exports are significant in explaining the variation in GDP. At 5% level of significance the first and third period lags of GDP (DLGDP_1 and DLGDP_3), the third period lag of FDI (DLFDI_3) and the lagged error correction term (ECT_1) are significantly different from zero, implying that they have an impact on GDP in the short run. The speed of adjustment towards long run equilibrium was 43.7% and significant. GDP granger causes exports and exports granger cause FDI, while all variables granger cause FDI. The study did not establish any granger causality between the variables of study. The econometric results show that the past and current Foreign Direct Investment, Trade Openness and economic growth of GDP itself have an impact on the growth domestic product in the long run. However in the short run it is export, first and third period lags of GDP, and the third period lag of FDI that have significant impact on GDP. Authorities should make sure that these are emphasized in the short run; however, in the long run outlook all Foreign Direct Investment, Trade Openness and economic growth should be emphasized.

Keywords: FDI, Trade Openness, Economic Growth, Regression

INTRODUCTION

Economic growth is an increase in the capacity of an economy to produce goods and services, compared from one period of time to another. It can be measured in nominal or real terms, the latter of which is adjusted for inflation. Traditionally, aggregate economic growth is measured in terms of gross national product (GNP) or gross domestic product (GDP), although alternative metrics are sometimes used Baldwin (2002).

Foreign direct investment (FDI) is a direct investment into production or business in a country by an individual or company of another country, either by buying a company in the target country or by expanding operations of an existing business in that country. Foreign direct investment is in contrast to portfolio investment which is a passive investment in the securities of another country such as stocks and bonds. World Bank (1996) conceptualized Foreign Direct Investment (FDI) as investment that is made to acquire a lasting management interest (usually 10% of voting stock) in an enterprise and operating in a country other than that of the investors (define according to residency) the investors purpose being an effective voice in the management of earning either long term capital or short term capital as shown in the nations balance of payments account statement (Macaulay, 2012). The privatization was also adopted, among other measures, to encourage foreign investments in Nigeria.

Trade openness are import and export of good and services which are stated below: Imports of goods and services: comprise all transactions between residents of a country and the rest of the world involving a change of ownership from nonresidents to residents of general merchandise, nonmonetary gold, and services. Imports will be measured in current USD. The idea that trade openness affects economic growth is not new again. However,

the nature of the effect is being seriously debated in the literature. Some empirical studies have identified a positive linkage between a country's rate of economic growth and its openness to international trade, while others have failed to demonstrate such linkage, (Jin, 2002; Sinha & Sinha, 1996). The crux of the differences in these results has been the differences in methodology as well as the way the openness variables were defined (Baldwin, 2002 and Ajayi, 2003). Most striking fact about the existing volume of studies is that despite the fact that both exports and imports are equally important in promoting economic growth, most researchers have focused attention on the former (Sinha & Sinha 2003, Jonsson & Subramanian, 2001).

LITERATURE REVIEW

The role of Foreign Direct Investment on economic growth

According to Macaulay, (2012), Foreign direct investment (FDI) is a direct investment into production or business in a country by an individual or company of another country, either by buying a company in the target country or by expanding operations of an existing business in that country. Foreign direct investment is in contrast to portfolio investment which is a passive investment in the securities of another country such as stocks and bonds. World Bank (1996) conceptualized Foreign Direct Investment (FDI) as investment that is made to acquire a lasting management interest (usually 10% of voting stock) in an enterprise and operating in a country other than that of the investors (define according to residency) the investors purpose being an effective voice in the management of earning either long term capital or short term capital as shown in the nations balance of payments account statement.

The impact of trade openness on economic growth

Trade openness is a measure of economic policies that either restrict or invite trade between countries. For example, if a country sets a policy of high trade tariffs, thus restricting the desirability of international trade, this restrictive policy will inhibit other countries from sending exports and accepting imports from that country. According to dominating economic theory, this restrictiveness, this lack of trade openness, will have an economic effect of slowing economic development/growth. Conversely, according to economic theory, trade openness will have an economic effect of increasing economic development and growth.

Empirical Review on the Relationship between FDI and Economic Growth

Previous studies on the Foreign Direct Investment (FDI) and economic growth in Nigeria and other countries provided inconclusive evidence. Lall (2002) opined that FDI inflow affects many factors in the economy and these factors in turn affect economic growth. This review shows that the debate on the impact of FDI on economic growth is far from being conclusive. The role of FDI seems to be country specific and can be positive, negative or insignificant, depending on the economic, institutional and technological conditions in the recipient countries.

Trade openness and Economic Growth

Baharumshah and Rashid (1999) detected the presence of a stationary long-run relationship between imports and GDP. The empirical findings of their study indicated that imports of foreign technology had become an important determinant of long-run economic growth in the fast growing Malaysian economy. Awokuse (2007) investigated the contribution of imports to economic growth in Bulgaria, Czech Republic, and Poland by using a neoclassical growth modeling framework and multivariate cointegrated VAR methods.

METHODOLOGY

VAR Model

First step is to consider an unrestricted VAR (p) model:

$$z_t = \Pi_1 z_{t-1} + \Pi_2 z_{t-2} + \dots + \Pi_p z_{t-p} + \Phi D_t + \varepsilon_t \quad (1)$$

Where z_t is a $(n \times 1)$ vector of endogenous variables, D_t is a $(q \times 1)$ vector of deterministic terms (such as constants, linear trends and dummies) and ε_t is a $(n \times 1)$ vector of n.i.d. disturbance terms, with zero mean and non-diagonal covariance matrix, Σ . Provided the data are I - (1), it was convenient to express (1) in its unrestricted error correction representation,

$$\Delta z_t = -\Pi z_{t-1} + \sum_{i=1}^{p-1} \Gamma_i \Delta z_{t-i} + \Phi D_t + \varepsilon_t \quad (2)$$

Where each of the $(n \times n)$ matrices $\Gamma = (-\Pi_{i+1})$ and $\Pi = (I - \Pi_1 - \dots - \Pi_p)$ comprise coefficients to be estimated by Johansen's (1988) maximum likelihood procedure, $i = 1, \dots, k-1$ is the number of lags included in the system and Δ is the first difference operator.

If at least some of the variables in Z_t are unit-root non Stationarity then Π in (2) has a reduced rank, and can be formulated as the hypothesis of cointegration:

$$\Pi = \alpha\beta'$$

Granger Non-Causality Test

The causal relationship between key macroeconomic indicators and economic growth was tested using the Granger (1969) approach, considering a bi variate case shown in equations (3), (4), (5), (6), (7) and (8). A key macroeconomic variable like Exports improves the prediction of GDP, that is to say Exports granger cause GDP, if the current value of GDP can be predicted better by using the past values of Exports. If the key macroeconomic variables are linear, then bi-variate framework between them and GDP was written as:

$$GDP_t = \sum_{i=1}^n \alpha_i IMP_{t-i} + \sum_{j=1}^n \beta_j GDP_{t-j} + \mu_{1t}, \quad (3)$$

$$IMP_t = \sum_{i=1}^n \chi_i IMP_{t-i} + \sum_{j=1}^n \delta_j GDP_{t-j} + \mu_{2t}, \quad (4)$$

$$GDP_t = \sum_{i=1}^n \varepsilon_i EXP_{t-i} + \sum_{j=1}^n \phi_j GDP_{t-j} + \mu_{3t}, \quad (5)$$

$$EXP_t = \sum_{i=1}^n \varphi_i EXP_{t-i} + \sum_{j=1}^n \gamma_j GDP_{t-j} + \mu_{4t}, \quad (6)$$

$$GDP_t = \sum_{i=1}^n \eta_i FDI_{t-i} + \sum_{j=1}^n \vartheta_j GDP_{t-j} + \mu_{5t}, \quad (7)$$

$$FDI_t = \sum_{i=1}^n \nu_i FDI_{t-i} + \sum_{j=1}^n \theta_j GDP_{t-j} + \mu_{6t}, \quad (8)$$

The Unit Root Test

The starting point of the unit root (stochastic) process is to start with a Random Walk Model

$$z_t = \rho z_{t-1} + \mu_t \quad (9)$$

Where z_t is a vector, ρ is a unit root and μ_t is the white noise error term, Subtracting z_{t-1} on both sides of equation (9) to obtain

$$\begin{aligned} z_t - z_{t-1} &= \rho z_{t-1} - z_{t-1} + \mu_t \\ &= (\rho - 1) z_{t-1} + \mu_t \end{aligned} \quad (10)$$

Equation (10) can alternatively be written as

$$\Delta z_t = \delta z_{t-1} + \mu_t \quad (11)$$

Where $\delta = (\rho - 1)$ and Δ is the first difference operator. Taking the first differences of z_t and regress them on z_{t-1} and if the estimated slope coefficient in the regression 11 is zero or not. If it is zero, we conclude that z_t is stationary.

The question is which test should be used to find out if the estimated coefficient of z_{t-1} in 11 is zero or not if the null hypothesis $\delta = 0$ is accepted (meaning the series are not stationary). The alternative is to use the t - test but the t - value of the estimated coefficient of z_{t-1} does not follow the t distribution even in large samples. The alternative is to use the Dickey and Fuller (1979) test which use the τ (tau) statistic based on Monte Carlo simulations. In Practice the Dickey Fuller (DF) is estimated in three different forms, assuming that the error term μ_t is uncorrelated.

$$z_t \text{ is a random walk : } \Delta z_t = \delta z_{t-1} + \mu_t \quad (12)$$

$$z_t \text{ is a random walk with a drift : } \Delta z_t = \beta_1 + \delta z_{t-1} + \mu_t \quad (13)$$

$$z_t \text{ is a random walk with a drift around a stochastic trend } \Delta z_t = \beta_1 + \beta_2 + \delta z_{t-1} + \mu_t \quad (14)$$

The actual estimation procedure is as follows: Estimate (12), or (13), or (14) by Ordinary Least Squares (OLS); divide the estimated coefficient of z_{t-1} in each case by its standard error to compute the τ tau statistic; and refer to the DF tables. If the computed absolute value of the tau statistic $|\tau|$ exceeds the DF or MacKinnon critical tau values, we reject the hypothesis that $\delta = 0$, in which case the time series is stationary. On the other hand, if the computed $|\tau|$ does not exceed the critical tau value, we do not reject the null hypothesis, in which case the time series is non stationary.

Supposing the error term in equations (12), (13) and (14) are correlated then the Dickey Fuller (DF) test wouldn't be applicable instead we would use the Augmented Dickey Fuller Test (ADF) test which is conducted by "augmenting" the equations (12), (13) and (14) by adding the lagged values of the dependent variable Δz_t . The ADF test starts with the estimation of the equation (15)

$$\Delta z_t = c_0 + c_2 t + \gamma z_{t-1} + \sum_{i=1}^p \delta_i \Delta z_{t-i} + \varepsilon_t \quad (15)$$

Where, c_0 is the intercept term, c_2 and γ are coefficients of time trend and level of lagged dependent variable respectively, Δ is the difference operator and ε_t are the white noise residuals. p is the lag length introduced to account for autocorrelation and is chosen using the minimum value of the Akaike Information Criterion [AIC], Schwartz Information Criterion [SIC] or the Hannan-Quinn Criterion [HQ].

Akaike Information Criterion [AIC]

The idea of imposing a penalty for adding regressors to the model has been carried further in the AIC criterion, which is defined as:

$$AIC = e^{\frac{2k}{n}} \frac{\sum \hat{\mu}_i^2}{n} = e^{\frac{2k}{n}} \frac{RSS}{n} \quad (16)$$

Where k is the number of regressors (including the intercept) and n is the number of observations. Introducing natural logs on both sides of equation (16)

$$\ln AIC = \ln \left(\frac{e^{\frac{2k}{n}}}{n} \right) + \ln \left(\frac{RSS}{n} \right) \quad (17)$$

Where $\ln AIC$ = natural log of AIC and $\frac{2k}{n}$ is the penalty factor. In comparing two or more models, the model with the lowest value of AIC is preferred. One advantage of the AIC is that it is useful for not only in-sample but also out sample forecasting performance of a regression model.

Schwartz Information Criterion [SIC]

The [SIC] is defined as

$$SIC = n^{\frac{k}{n}} \frac{\sum \hat{\mu}_i^2}{n} = n^{\frac{k}{n}} \frac{RSS}{n} \quad (18)$$

Introducing natural logs to both sides of equation (18)

$$\ln SIC = \ln \left(\frac{n^{\frac{k}{n}}}{n} \right) + \ln \left(\frac{RSS}{n} \right) \quad (19)$$

Where $\left[\left(\frac{k}{n} \right) \ln n \right]$ is the penalty factor, SIC imposes a harsher penalty than AIC, as is obvious from comparing (19) and (17). Like AIC, the lower the value of SIC, the better the model. Again, like AIC, SIC can be used to compare in-sample or out-of-sample forecasting performance of a model.

Normality test

Normality test was carried out on each variable in its log level form. When the Jarque-Bera value is low and the probability is high, that is, it is in excess of 0.5; we can conclude that the variable is normally distributed.

When the probability distribution is perfectly normal the Jarque-Bera value is zero, whenever its value is nearer to zero that alludes to normal distribution. The Jarque-Bera value is as low as possible when it is less than 0.5. That is so because whenever it is rounded off the result is practically Zero. The Jarque-Bera was used for this research because the sample units were enough. When the sample size is not big enough it is not advisable to use this test. The sample size was big enough, that is, 47 sample units.

Multicollinearity test

The correlation matrix for the variables was drawn and analyzed. When the correlation value is very close to zero it is concluded that the variables have no close relationship. When R^2 of the run regression is high and the partial coefficients of the regression are statistically different from zero then we are bound to conclude that there is no multicollinearity.

Unit Root Tests for Stationarity

Using the Augmented Dickey-Fuller (ADF) test for Stationarity, unit root tests was carried out for each variable. The ADF-Test will be used on series in level and in the 1st difference. Conclusions about Stationarity was made by comparing the ADF-Statistic and the Critical values (C.V) at 1, 5 and 10 percent. When the ADF-Statistic is greater in absolute terms than the critical value, the series is said to be stationary and the reverse implies non-Stationarity. Series that are stationary in levels are integrated of order zero $\{1(0)\}$. While those stationary after the first difference are integrated of order one $\{1(1)\}$ and if stationary after the second difference, then the series are integrated of order two $\{1(2)\}$ and so on.

Breusch-Godfrey serial correlation LM Test for serial correlation

After estimating the model, we proceed to test whether the errors of this model are serially independent or not, we set the null hypothesis thus: there is no serial correlation; when the probability value of the F-statistic is more than 0.05, we do not reject the null hypothesis, and conclude that there was no serial correlation.

Testing for model stability using recursive estimates (CUSUM test)

When the CUSUM line lies between the 5% significance boundaries, we concluded that the estimated model is stable.

Wald Bounds test for the existence of a long run relationship among variables

If the computed F-statistic falls below the lower bound (Pesaran bound testing) we would conclude that the variables are $I(0)$, so no cointegration is possible, by definition. If the F-statistic exceeds the upper bound, we conclude that we have cointegration. Finally, if the F-statistic falls between the bounds, the test is inconclusive. The critical value bounds of the F statistics at 95% confidence interval F (3.793, 4.855). If the computed F statistics is above the upper bound and its probability is significant ie ($p < 0.05$) then it's significant. If f statistic exceeds the upper bound, we conclude that we have cointegration; therefore we proceeded to estimate the long-run relationship between variables.

RESULTS AND DISCUSSION

Unit Root Test

Visual inspection of the data reveals that all the variables follow the same pattern, i.e. are not stationary as they are not mean-reverting in levels. However, in first differences, they seem to be mean-reverting and therefore stationary.

More formally, the series are tested for the order integration or non-stationary using the Augmented Dickey Fuller (ADF) unit root tests (Dickey and Fuller, 1979). Results of Unit root are provided.

Augmented Dickey – Fuller (ADF) Unit Root Test

At levels		At Intercept			At Trend and Intercept			
		Test Critical Values			Test Critical Values			
Variable	ADF Test Statistic	1%	5%	10%	ADF Test Statistic	1%	5%	10%
LGDP	0.464	-3.588	-2.929	-2.603	-0.676	-4.181	-3.515	-3.188
LIMPORTS-	-0.929	-3.588	-2.929	-2.603	-1.697	-4.181	-3.515	-3.188
LEXPORT	-1.413	-3.588	-2.929	-2.603	-2.473	-4.181	-3.515	-3.188
LFDI	-0.739	-3.588	-2.929	-2.603	-4.287	-4.181	-3.515	-3.188
At first differences								
LGDP	-6.277	-3.592	-2.931	-2.604	-6.262	-4.186	-3.518	-3.189
LIMPORTS-	-5.047	-3.592	-2.931	-2.604	-4.983	-4.186	-3.518	-3.189
LEXPORT	-7.194	-3.592	-2.931	-2.604	-7.129	-4.186	-3.518	-3.1
LFDI	-12.209	-3.592	-2.931	-2.604	-12.062	-4.186	-3.518	-3.189

The variables are non-stationary at levels since the magnitude of ADF test statistic is less than the magnitude of the test critical values at intercept and at trend and intercept at 5%. The variables become stationary or I (1) in their first differences since the magnitude of ADF test statistic is more than the magnitude of the test critical values at intercept and at trend and intercept at 5%. All the variables had a unit root at level but they became stationary after the first differencing.

Structural breaks in the series

The Quandt-Andrews and Chow breakpoint test confirmed the presence of a structural break in the variables in 2007. This compelled the researcher to create a dummy variable where it takes on value 0 for the period before 2007 and one for the period 2007 and after.

The Quandt-Andrews Breakpoint Test

Quandt-Andrews unknown breakpoint test
Null Hypothesis: No breakpoints within 15% trimmed data
Varying regression: All equation variables
Equation Sample: 1974- 2020
Test Sample: 1978- 2008
Number of breaks compared: 31

Statistic	Value	Prob.
Maximum LR F-statistic (2007)	3.538369	0.1715
Maximum Wald F-statistic (2007)	10.61511	0.1715
Exp LR F-statistic	0.549478	0.5168
Exp Wald F-statistic	2.748424	0.1998
Ave LR F-statistic	0.894230	0.4840
Ave Wald F-statistic	2.682689	0.4840

Note: probabilities calculated using Hansen's (1997) method

Chow Breakpoint Test: 2007
Null Hypothesis: No breaks at specified breakpoints
Varying regression: All equation variables
Equation Sample: 1971 2014

F-statistic	3.538369	Prob. F(3,38)	0.0235
Log likelihood ratio	10.83932	Prob. Chi-Square(3)	0.0126
Wald Statistic	10.61511	Prob. Chi-Square(3)	0.0140

Determination of the Optimal Lag length

The choice of the lag length is determined as the minimum number of lags that meets the crucial assumption of time independence of residuals, based on the Langle Multiplier (LM) test. The optimal lag length p was determined using the, Akaike Information Criterion (AIC), Schwartz Information Criterion (SIC) and Hannan-Quinn Criterion (HQ) presents an assessment of the optimal lag length using AIC, SIC and HQ.

Results of lag order selection.

VAR Lag Order Selection Criteria

Endogenous variables: DLGDP DUMMY DLIMPORTS DLFDI DLEXPORTS

Exogenous variables: C

Date: 10/3/21 Time: 10:50

Sample: 1974- 2020

Included observations: 47

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-59.61564	NA	1.61e-05	3.151983	3.360955	3.228079
1	2.175389	105.4969	2.70e-06*	1.357298*	2.611131*	1.813875*
2	15.00744	18.77861	5.18e-06	1.950857	4.249551	2.787914
3	46.91815	38.91551*	4.30e-06	1.613749	4.957304	2.831287

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Since low values of Akaike Information criterion [AIC], were preferred in the choice of the optimal lag length, then from table 3 then the best lag length would be one. Results of the LM test (which is the most important under VAR frame work see Johansen, 1995: 21-23) the null hypothesis of no serial correlation in the residuals is not rejected at 5% level of significance.

Cointegration Test Results

After determining the order of integration, we try to establish whether the non-stationary variables are co integrated. This was because, as pointed out by Engle and Granger (1987), even though individual time series are non-stationary, linear combinations of them can be, because equilibrium forces tend to keep such series together in the long run.

Johansen Co integration test results

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.529347	56.46548	47.85613	0.0063
At most 1	0.338118	24.05921	29.79707	0.1979
At most 2	0.125705	6.314508	15.49471	0.6584
At most 3	0.012433	0.537983	3.841466	0.4633

Trace test indicates 1 cointegration (s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug- (1999) p-values

Granger Causality tests

VEC Granger Causality/Block Exogeneity Wald Tests

Date: 10/3/21 Time: 15:29

Sample: 1974- 2020

Included observations: 47

Dependent variable: D(DLGDP)

Excluded	Chi-sq	df	Prob.
D(DLIMPORTS)	2.818351	2	0.2443
D(DUMMY)	1.280205	2	0.5272
D(DLFDI)	1.508022	2	0.4705
D(DESPORTS)	0.007967	2	0.9960
All	6.585169	8	0.5820

Dependent variable: D(DLIMPORTS)

Excluded	Chi-sq	df	Prob.
D(DLGDP)	1.667064	2	0.4345
D(DUMMY)	0.004112	2	0.9979
D(DLFDI)	3.592242	2	0.1659
D(DESPORTS)	3.951471	2	0.1387
All	6.171871	8	0.6280

Dependent variable: D(DUMMY)

Excluded	Chi-sq	df	Prob.
D(DLGDP)	4.789773	2	0.0912
D(DLIMPORTS)	3.378872	2	0.1846
D(DLFDI)	1.316577	2	0.5177
D(DEXPORST)	3.393219	2	0.1833
All	9.789135	8	0.2801

Dependent variable: D(DLFDI)

Excluded	Chi-sq	df	Prob.
D(DLGDP)	4.139312	2	0.1262
D(DLIMPORT)	4.848924	2	0.0885
D(DUMMY)	2.304877	2	0.3159
D(DEXPORST)	9.885466	2	0.0071
All	17.94680	8	0.0216

Dependent variable: D(DLEXPORST)

Excluded	Chi-sq	df	Prob.
D(DLGDP)	8.167162	2	0.0168
D(DLIMPORTS)	3.103314	2	0.2119
D(DUMMY)	1.903157	2	0.3861
D(DLFDI)	0.272147	2	0.8728
All	12.30288	8	0.1382

Estimation results for the long run Macroeconomic indicator function

Dependent Variable: LGDP

Method: Least Squares

Date: 10/3/21 Time: 14:15

Sample: 1974- 2020

Included observations: 47

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	10.40219	1.112647	9.349050	0.0000
LIMPORTS	0.251020	0.118755	2.113764	0.0408
LFDI	-0.192787	0.064817	-2.974332	0.0050
LEXPORTS	0.528923	0.116876	4.525494	0.0001
DUMMY	0.885615	0.148083	5.980541	0.0000
R-squared	0.954194	Mean dependent var		24.63024
Adjusted R-squared	0.949614	S.D. dependent var		1.051366
S.E. of regression	0.235999	Akaike info criterion		0.054458
Sum squared resid	2.227815	Schwarz criterion		0.255198
Log likelihood	3.774692	Hannan-Quinn criter.		0.129292
F-statistic	208.3141	Durbin-Watson stat		0.808272
Prob(F-statistic)	0.000000			

The coefficient of the residual term in Error Correction model must be statistically significant. The can be determined by using a t-test. The p-value can also be used to determine the significance of the coefficient. When the p-value is above 0.05 but less than 0.10, then the coefficient is significant at 10 percent. When the p-value is above 0.01 and less then 0.05, then the coefficient is statistically significant at 5 percent. When the p-value is less than 0.01, then the coefficient is significant at 1 percent. Use of p-values can be more beneficial in determining the statistical significance of the coefficient than using the t-test. The p-values of the coefficients can be read directly from the regression line.

Dynamic Error Correction Model

Using the general-to-specific procedure, the analysis begun with three lags for each variable, the dummy variable and the ECT_1. The residuals generated here in subjected to the whiteness test (heteroscedastisty, autocorrelation and normality tests) proved to be white. We run the following Error Correction model.

D(LGDP) c LGDP(-1) LGDP(-2) LGDP(-3) D(LIMPORTS) D(LIMPORTS (-1)) D(LIMPORTS-EXPORTS(-2)) D(LIMPORTS (-3)) D(LFDI) D(LFDI(-2)) D(LFDI(-3)) D(EXPORTS) D(EXPORTS(-1)) D(EXPORTS(-2)) D(EXPORTS(-3)) DUMMY ECT(-1)

Estimation results of the preferred ECM

Dependent Variable: D(LGDP)

Method: Least Squares

Date: 10/3/21 Time: 11:42

Sample (adjusted): 1975- 2020

Included observations: 40 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.616157	2.305508	-0.700998	0.4903
LGDP(-1)	-0.537308	0.232397	-2.312031	0.0301
LGDP(-2)	0.724983	0.273952	2.646384	0.0144
LGDP(-3)	-0.120355	0.264396	-0.455205	0.6532
D(LIMPORTS)	0.161498	0.131494	1.228176	0.2318
D(LIMPORTS (-1))	0.006151	0.150168	0.040959	0.9677
D(LIMPORTS (-2))	-0.090778	0.138841	-0.653824	0.5197
D(LIMPORTS (-3))	0.069638	0.103747	0.671227	0.5088
D(LFDI)	-0.022799	0.057216	-0.398475	0.6940
D(LFDI(-2))	0.089394	0.061706	1.448719	0.1609
D(LFDI(-3))	0.141537	0.059934	2.361574	0.0270
D(EXPORTS)	0.367790	0.094275	3.901246	0.0007
D(EXPORTS(-1))	0.110231	0.131038	0.841213	0.4089
D(EXPORTS(-2))	0.041030	0.129467	0.316912	0.7542
D(EXPORTS(-3))	0.021368	0.102540	0.208388	0.8368
DUMMY	-0.010336	0.165472	-0.062464	0.0407
ECT(-1)	-0.437637	0.245041	1.785974	0.0373
R-squared	0.800388	Mean dependent var		0.078257
Adjusted R-squared	0.661527	S.D. dependent var		0.239380
S.E. of regression	0.139267	Akaike info criterion		-0.808228
Sum squared resid	0.446094	Schwarz criterion		-0.090454
Log likelihood	33.16456	Hannan-Quinn criter.		-0.548704
F-statistic	5.763971	Durbin-Watson stat		2.179136
Prob(F-statistic)	0.000088			

The regressions results show that the goodness of fit is satisfactory (Adj. R-squared = 0.8), implying that the regressors in the model explain about 80% of the variations in the gross domestic product during the period 1970-2014. Thus 20% of the variation in gross domestic product remains unexplained. The F-statistics of 5.763971, with a probability value of 0.000088 indicated overall that the model is highly significant and therefore nullifies the hypothesis that all the right hand variables except the constant have zero parameter coefficients.

Breusch-Godfrey serial correlation LM Test

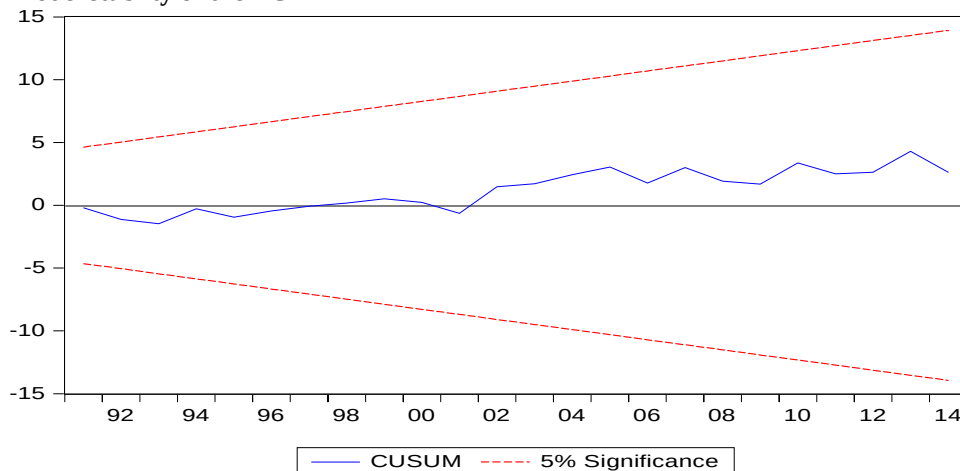
Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.209090	Prob. F(2,22)	0.8129
Obs*R-squared	0.746145	Prob. Chi-Square(2)	0.6886

The probability value of the F-statistic is 81.3%, which is way more than 5%, implying that we could not reject the null hypothesis, and conclude that there is no serial correlation. We proceed to test for model stability using the cusum diagnostic test.

We proceed to test for model stability using the cusum diagnostic test. All of the inverse roots of the characteristic equation associated with our model lay strictly between the 5% significance boundaries lines of the cusum graph.

Model stability of the ECM



The CUSUM line (blue line) lies between the 5% significance boundaries. Therefore we can conclude that our model is stable, and as seen above also has no serial correlation.

CONCLUSION AND POLICY IMPLICATIONS

The results suggested that the real money supply is cointegrated with GDP, exports, Imports and FDI, albeit with a break in 2007. In addition, the coefficient of one period lag of the error correction term suggested that about 43.8 per cent of the disequilibrium is corrected after one quarter. The results confirmed that there are intercept and regime shifts in 2007.

The identified break date coincides with a period of persistent excess liquidity exacerbated by the monetization of excess crude receipts and the distribution of enhanced statutory allocation to the three tiers of government. Other contributory factors to the liquidity surfeit include huge autonomous inflow of foreign exchange and pre-election spending.

The CUSUM test show the recursive residual plots of the demand for money function are within the 5% critical lines, hence, providing evidence of stable GDP function for Nigeria pre- and post-global financial crisis period. The effect of the identified structural break was accommodated in our modeling approach to ensure that the estimated parameters are unbiased. In the short run only exports have an impact on GDP. The ECM revealed that a one percent increase in exports will lead to an increase in GDP by 36.7. The implication of this is that authorities should ensure that the exports are emphasized in the short run.

The speed of adjustment towards long run equilibrium was 43.7 percent; this means that 43.7 percent of the previous errors in the gross domestic product are corrected for in the current period "t". At 5% level of significance the first and third period lags of GDP (DLGDP_1 and DLGDP_3) and the third period lag of FDI (DLFDI_3) and the lagged error correction term (ECT_1) are significantly different from zero. However, unlike the coefficient of the lagged error correction term that bears the correct hypothesized sign, the coefficient of the first period lag of gross domestic product is not correctly signed.

The econometric results show that the past and current Macroeconomic indicators i.e. GDP itself, imports, exports and FDI, have an impact on the growth domestic product in the long run. However in the short run its only exports, first and third period lags of GDP, and the third period lag of FDI have a significant impact on GDP. Authorities should make sure that these are emphasized in the short run; however in the long run outlook all Macroeconomic indicators should be emphasized.

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WHAT INFLUENCES FARMERS' CHOICE FOR MODERN FARM INPUTS? A CASE OF IRRIGATIONAL FARMERS IN AUYO LOCAL GOVERNMENT AREA JIGAWA STATE, NIGERIA

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Abstract

The main purpose of the study is to examine the factors influencing farmers' choice of modern farm inputs such as inorganic fertilizer among irrigation farmers in Auyo Local Government Area of Jigawa State, Nigeria. Data for the study was sourced using structured questionnaire, a two-stage sampling technique was used to select the respondents. Logit regression model was estimated to analyse the factors that influence modern fertilizer adoption, the result of the estimated model shows that, marital status, farm size, farming experience, contact with extension workers and membership of association; were statistically significant in determining fertilizer adoption in Auyo local government area, Jigawa State. The result further shows that the major obstacles to fertilizer adoption and use intensity include: high cost of fertilizer, lack of credit facilities, inadequate supply, untimely supply, hoarding of fertilizer by agents, hoarding of fertilizer by agents and supply of undesired type. The study recommends that, government should enhance the services of extension workers, offer micro finance services, provide credit facilities, skills and training programmes on some off – farm jobs for farmers in the study area.

Keywords: Fertilizer, Adoption, Logit-Model, Constraints

INTRODUCTION

Agriculture is the main livelihood for over 70 percent of households in Nigeria (Banful et al., 2009). An estimated 65% of the population resides in the rural areas where agriculture is predominantly the occupation. It is estimated that about 70% of the rural population engage in agriculture yet cannot produce cheap adequate food for the country (Kofarmata & Danlami, 2019; Manyong et al., 2005). In Nigeria, agriculture remains a significant sector in the nation's economy despite the extensive role of the oil sector in the economy. It serves as the economic mainstay of the majority of households in the country (Amaza, 2000; Udoh, 2000). It contributes about 45% of the GDP, employs two-third of total labour force and provides livelihood for over 90% of the rural population. The sector is dominated by smallholder farmers accounting for over 90% of the total output while more than half of the farmers produce only food crops (Tsauni & Danlami, 2016; IFAD, 2010).

Land fragmentation as imposed by increasing population density and urbanization has resulted in increasing land use intensification which resulted to the collapse of the traditional fallow system of cropping, increase soil depletion and low crop yield among farmers (Azagaku & Anzaku, 2002) the pressure necessitated the need for a better way of increasing soil fertility, hence, the adoption of fertilizer for enhanced productivity (Makinde, Agboola & Oluwatoyinbo, 2001).

Fertilizer is known to be a powerful productivity enhancing input. Indeed one-third of the increase in cereal production worldwide has been attributed to fertilizer related factors (FAO (1999). Danlami (2014a), argue that "fertilizers contributed 55-57% of the rise in average yield per hectare". Also, practical experiences have shown

that chemical fertilizer is one of the most reliable productivity enhancing inputs available to farmers (Ezeh, Onwuka, & Nwachuku, 2006). However despite the vital role played by fertilizer in agricultural production, farmers in Sub-Saharan Africa (SSA) still lag behind other areas in terms of fertilizer use compared to the recommended level (Danlami, 2014b). The application of fertilizer improves the soil fertility in view of the continuous cropping of the fragmented land available to farmers. Experiences have shown that chemical fertilizer is one of the most reliable productivity enhancing inputs available to farmers (Onwuka, 2005).

Fertilizer in broad sense includes all those organic and inorganic materials that are added to the soil to provide elements essential for the growth of plants (Danlami, 2014b; Fayaz, Ali, Jan & Jan, 2008). Fertilizer is known to be a powerful productivity enhancing input, indeed one-third of the increase in cereal production worldwide has been attributed to fertilizer related factors. In the same vein, Pinstrup – Anderson (1974), argued that fertilizers contributed to 55 - 57% of the rise in average yield per hectare (cited in Danlami, 2014b).

Fertilizer use was estimated at 13 kg/ha in 2009 by the Federal Ministry of Agriculture and Rural Development (FMARD), far lower than the 200 kg/ha recommended by the FAO thereby resulting to declining soil fertility which is one of the major reasons for slow growth rate in food production in the country (Ogunmola, 2007). Consequently, low fertilizer use has been identified as a major challenge that must be overcome in order to increase Nigeria's agricultural productivity. It is in this light that this study seeks to examine fertilizer use and its determinants among food crop farmers.

Therefore, agricultural productivity growth in Sub-Saharan Africa lags behind that of other regions in the world, and is well below that required to achieve food security and poverty goals. Many farmers in the region are facing declining crop yields, which have adverse effects on the region's economic growth (Hassan, 1998). A prominent constraint to higher productivity among farmers in the region is "soil infertility" related mainly to low nutrient status of the soils and continuous cultivation without planned replenishment of depleted soil nutrients (Wanyama *et al.*, 2009). Increasing agricultural productivity in the Sub Saharan Africa especially in Nigeria is an urgent necessity; and one of the fundamental ways of improving agricultural productivity is through introduction and optimal use of improved agricultural technologies.

Reduced rate of fertilizer application in Nigeria (especially rural areas) may have adverse implications on soil fertility, agricultural productivity and rural poverty reduction. For instance Oke *et al.* (2009), argue that more than all other inputs, access to fertilizer and inadequate farming and storage facilities remain the key drawback to the growth of agriculture in Nigeria. Lack of fertilizer means low yield and low yield result to low income, and low income further keeps fertilizer economically out of reach of local farmers (cited in Danlami, 2014b). Moreover, Nwagbo and Achoja (2001) as cited in Ezeh, Onwuka and Nwachuku, (2006), argued that various factors and constraints are at play in the microeconomic environment of the farmers which results to low consumption or application of inorganic fertilizer despite its vital role in enhancing productivity. However, as there is a strong correlation between crop yield and the volume of fertilizer utilisation (consumption), so is between fertilizer consumption of the farmer and selected socio-economic indicators. This condition motivates the need to analyse and assess the factors that influence small farm holders' fertilizer demand in rural areas using socioeconomic variables, as this will contribute towards the designing of policies that will stimulate fertilizer consumption in the rural areas.

Objectives of the Study

The main objective of the study was to assess the determinants of demand for fertilizer in Auyo Local Government Area. The specific objectives of the study are:

- I. to examine the factors influencing the adoption of modern fertilizer among irrigation farmers in the study area;
- II. to identify the various constraints to modern fertilizer adoption in the study area.
- III. to assess the intensity of modern fertilizer usage among farmers that adopt modern fertilizer in the study area.

METHODOLOGY

Description of the study area

Auyo is a Local Government Area (LGA) in Jigawa state with its headquarters in Auyo. This LGA is occupied by the Auyo people and had Auyokawa as the dominant language (dialect) in the Local Government Area. At the moment, Auyokawa is extinct and Hausa language is the new adopted language in this Local Government Area. Auyo has a landmass of 512km² and has 731 as its postal code. Auyo has 132,268 as its population based on 2006 population census which is projected to rise to 176,800 by the year 2018 (NPC, NBS). The population

of farmers under irrigation scheme is estimated to be 9,654 (FMA- GESS 2015). Auyo Local Government Area is surrounded by five other Local Government Areas; they are Hadejia, Malam Mandori, Kafin Hausa, Kaugama and Miga Local Government Areas

Method of Data Collection

Kothari (2004) defined data collection as the process of gathering empirical evidence to gain fresh insight into the situation and to answer research questions. For the purpose of this study, a structured questionnaire was used as an instrument for the collection of data. This research adopted questionnaire method because; it is more practical and economical than most of the other data collection techniques. Moreover, information can be solicited easily from many respondents within a short period of time. It also provides the researcher with high degree of flexibility by providing different alternative ways of administering questionnaire. The information generated from the respondents based on questionnaire is easily comparable. Additionally, it offers greater anonymity which makes respondents to provide more responses easily. Large samples that often considered in a questionnaire method makes results to be morereliable and dependable(Danlami, 2017; Kumar, 2011; Mackey & Gass, 2005; Kothari, 2004)

Tools of Data Analysis

Mugenda and Mugenda (2003) define data analysis as the process through which the collected data is sorted, classified and coded to produce units of measure for analysis. It involves summarizing and grouping data based on the study theme and objectives to be fulfilled. For the purpose of the study in order to achieve the set objectives, Logit Model was employed. This is because the dependent variable has two categories namely; whether farmers in Auyo LGA adopt modern farm inputs or not.

Logit Model

The Logit Model was developed by David Cox in 1958 to estimate the binary response based on one or more predictor variables. This study employed the Logit model to assess the significance of different variables in determining the binary response with regards to adoption of fertilizer as a farming input among irrigation farmers in the study area. Logit model has been widely used in previous researches with better results (Danlami et al., 2017)

Specification of the Logit Model

This study employed the Logit Model to estimate the significance of different variables in determining the adoption of fertilizer as a farming input. Here the dependent variable (Y_i) takes value 1, if the sampled farmer adopts modern fertilizer or 0 if otherwise. Let P_i be the probability that a farmer adopt modern fertilizer and $(1 - P_i)$ defines the probability that the farmer does not adopt the modern fertilizer.

Following Danlami et al. (2017) and Gujarati (2004), the general form of the probability that a farmer adopt fertilizer as a farming input is given as:

$$P_i = \frac{e^{\beta_i K_i}}{1 + e^{\beta_i K_i}} \quad (1)$$

And the probability that the farmer does not adopt fertilizer is given by

$$1 - P_i = \frac{1}{1 + e^{\beta_i K_i}} \quad (2)$$

Where:

β_i Vector of unknown coefficient

X_i Vector of explanatory variables

The binary choice model is specified in form of;

$$L_i = \ln \left(\frac{P_i}{1 - P_i} \right) = Y^* = \beta_0 + \sum \beta_i X_i + \mu_i \quad (3)$$

Where Y^* is a dichotomous dependent variable which can either assume a value of 1 or 0. It thus measures the determinant of fertilizer adoption as a farming input. In this study, QF is conceptualized as an observed dependent binary variable defined by:

$$QF_i = \alpha_i + \beta_1 INC_i + \beta_2 FS_i + \beta_3 PX_i + \beta_4 AC_i + \beta_5 PF_i + \beta_6 MA_i + \beta_7 EXT_i + \beta_8 ED_i + \beta_9 FE_i + \mu_i \quad (4)$$

Where:

QF = quantity of Fertilizer adopted

INC = Income of the farmer

FS = Farm Size
 PX = Price of Output
 AC = Access to Credit
 PF = Price of Fertilizer
 MA = Membership of Association
 EXT = Extension Services
 ED = Farmers Level of Education
 FE = Farming Experience
 $\beta_1 \dots \beta_6$ = represents the regression coefficient
 μ = Error Term

Tobit Model

Since some significant number of farmers in the study area does not use modern fertilizer, or they use very meagre amount that is closer to zero bag on an average size of farmland, Tobit regression model was employed in the analysis. Therefore, the Tobit model estimation was conducted to utilise both zero and non-zero values of the dependent variable (i.e. fertilizer consumption per irrigation farmer household) in order to take into account the significant number of zero observations. This model has been widely utilised in studies of household behaviour (Lee, 2013; Song et al., 2012; Jingchao and Kotani, 2012) as cited in Danlami *et al* (2016). Tobit model is usually estimated using a method of maximum likelihood estimation.

Specification of the Tobit Model:

Following Danlami et al. (2016), the log likelihood function for Tobit model can be expressed as follows:

$$LL_{Tobit} = \sum_{i=0}^* 1 - \delta \left(\frac{y_i}{\sigma_i} \right) + \sum_{i=+}^* \frac{1}{\sigma_i} \phi \left(\frac{y_i}{\sigma_i} \right) \quad (5)$$

where “0” indicates the total sum of the zero observations in the sample (i.e. $y_i=0$), “+” represents the total over the positive observations (i.e. $y_i>0$), δ stands for the standard normal random variable cumulative distribution function (cdf) and ϕ represents the standard probability normal density function (pdf).

Maximisation of the above likelihood function with respect to ζ and β will give the maximum likelihood estimates of these parameters.

In this model, the observed fertilizer consumption (Y) of a farmer household takes “0” or a positive value. The relationship between the censored variable (y) and the independent variables can be expressed by the Tobit model, where it is assumed that the observed endogenous variables Y_i for observations $i=1, 2, 3, \dots, n$ satisfy the following:

$$Y_i = \max(Y_i^*, 0) \quad (6)$$

where Y_i^* 's are the latent variables generated using linear regression model:

$$Y_j^* = \beta' X_j + s_j \quad (7)$$

where X_j is the vector of regressor variables. The model error ϵ_j is assumed to be normally distributed with zero mean and constant variance (iid~N(0; δ_2)). The observed value of Y_i is censored below 0, that is, as is shown below:

$$Y_i = \begin{cases} Y_i^* & \text{if } Y_i^* > 0 \\ 0 & \text{if } Y_i^* \leq 0 \end{cases} \quad (8)$$

In this model, a farmer household consumes fertilizer only when the latent variable Y^* takes a positive value, and the actual consumption $Y=Y^*$. Otherwise, the household does not use fertilizer and therefore $Y=0$. The empirical estimate of the Tobit model to use to estimate the farmer household fertilizer consumption is presented in the following equation:

$$QF_i = \alpha_i + \beta_1 INC_i + \beta_2 FS_i + \beta_3 PX_i + \beta_4 AC_i + \beta_5 PF_i + \beta_6 MA_i + \beta_7 EXT_i + \beta_8 ED_i + \beta_9 FE_i \quad (9)$$

Where: QF = quantity of Fertilizer adopted

INC = Income of the farmer

FS = Farm Size

PX = Price of Output

AC = Access to Credit

PF = Price of Fertilizer

MA = Membership of Association

EXT = Extension Services

ED = Farmers Level of Education

FE = Farming Experience

$\beta_1 \dots \beta_6$ = represents the regression coefficient

Sample Size

The total sample size in the study was arrived at based on Dillman (2011). According to Dillman (2011), the formula for determining a good representative sample is as follows:

$$S = \frac{NP(1 - P)}{(B/C)^2 (N - 1) + P(1 - P)}$$

where S is the required sample size; N the population size = 9,654 the population proportion expected to answer in a particular way (the most conservative proportion is 0.50); B the degree of accuracy, expressed as a proportion (0.10); and C the Z-statistic value based on the confidence level (in this case 1.96 is chosen for the 95 per cent confidence level). This formula has been widely used in the studies of household behavior (Danlami & Islam, 2020; Danlami et al. 2019a; Danlami et al. 2018a; 2018b; Danlami et al. 2017).

The sample size was formulated as follows:

$$S = \frac{(9,654 \times 0.5)(1 - 0.5)}{(0.05/1.96)^2 (9654 - 1) + 0.5(1 - 0.5)}$$

$$S = \frac{2413.5}{6.53}$$

$$S = 369.6$$

Sampling Technique

This study used two stage sampling technique. In the first stage, 4 ward community areas were selected using a convenience random sampling technique out of the total 9 wards in the local government area. In the second stage, 115 irrigation farmers were selected at convenience from each of the selected sectors, making a total sample size of 460 households to be used for the study.

RESULTS AND DISCUSSION

Results and Discussion of Estimate of Logit Model

One of the objectives of this work is to examine the factors influencing the adoption of modern fertilizer among farmers in the study area. To achieve this objective, Logit Model was estimated based on the information obtained from the selected samples of the study. The result of the estimated logit model is shown in Table 1 as follows:

Table 1: Estimated Logit Model for Fertiliser Adoption

Variable	Coefficients	ME
Age	.0281699 (.020308)	.0006182 (.00054)
m_status	1.533931 (.5753992)	.023335 (.01325)
income_f	-.0146231 (.0177979)	-.0003209 (.00041)
income_o	.0073785 (.0368496)	.0001619 (.00082)
Fsize	.4402044 (.127809)	.0096606 (.00302)
f_experience	.2568094 (.1189302)	.0056359 (.00401)
extension_~t	.314294 (.3384072)	.0068974 (.0086)
Education	-.0682031 (.1562912)	-.0014968 (.00341)
Assoc	1.543767 (.457044)	.0319423 (.01874)
_cons	-3.547299 (1.444255)	

Note: standard errors in parenthesis.

Table 1 indicates the estimated coefficients and marginal effects of the probability of irrigation farmers' adoption of modern fertilizer based on the estimated logit model. Out of the total number of nine variables included in the model, five were found to be statistically significant in explaining the probability of adoption of modern fertilizer by irrigation farmers in Auyo Local Government Area of Jigawa State.

Farm Size: The coefficient for the variable farm size is .4402044. This means for a unit increase in farm size, we expect a .4402044 increase in the log odds of adoption of modern fertilizer by the farmers in the study area. This implies that when farmer's farm size increases, the possibility of such farmer to adopt modern fertilizer also increases, indicating that the more the acres of land is acquired for cultivation, the higher will be the possibility of farmer's decision to adopt modern fertilizer. In addition, the value of the coefficient of this variable was also found to be statistically significant at 1% level and positively related to the probability of modern fertilizer adoption, these tallies with a priori expectation of the study and is in conformity with the findings of Akpan (2014), and Thuo (2012).

However, the value of the marginal effect for farm size was found to have positive relationship with the probability of modern fertilizer adoption farmers in the study area. An increase in farmer's farms size will raise the probability of modern fertilizer adoption by 0.003.

Membership of Association: The coefficient for the variable membership of farmers' association is 1.543767. This means for a unit increase in membership of farmers' association, we expect a 1.543767 increase in the log odds of adoption of modern fertilizer by the farmers in the study area. This might be attributed to the fact that farmers' participation in association activities enlightens them on the benefits associated with adoption and more ways of accessing the modern fertilizer. The value of coefficient of this variable was also found to be statistically significant at 1% level and positively related to the probability of modern fertilizer adoption, this conforms to a priori expectation of the work and was also in conformity to the work of Dube, (2016).

However, the marginal effect of the variable also shows that the higher the farmer's participation in farmers' association, the higher the probability of fertilizer adoption, implying that the adoption of modern fertilizer increases with more participation of farmers in the farmers' association in the study area.

Contact with Extension Agent: The coefficient for this variable is .314294. This means for a unit increase in contact with extension agents, we expect a .314294 increase in the log odds of adoption of modern fertilizer by the farmers in the study area. This is because agricultural extension workers are expert in farming activities that usually serve as free consultants to farmers. The variable was statistically significant at 1% level. This tallies with a priori expectation of the study and is in conformity to the findings of Danlami et al (2019b), and Nambiro (2012).

The marginal effect of this variable was also found to be positively related to the fertilizer adoption. This implies that the probability of fertilizer adoption increases with increase in the farmers contact with agricultural extension workers.

Marital Status: The coefficient for this variable marital status is 1.533931. This means for the married farmers, we expect a 1.533931 increase in the log odds of adoption of modern fertilizer by the farmers in the study area. This may be due to the fact that married farmers pay more attention to farming in a bid to produce for their families and also for additional income. The variable was statistically significant at 5% level. This tallies with a priori expectation of the study and is in conformity to the findings of Akpan (2014), and Nambiro (2012).

However, the marginal effect of this variable was found to be positively related to the fertilizer adoption. This implies that the probability of fertilizer adoption increases with marital status of the farmers.

Farming Experience: the coefficient of the variable is .2568094 indicating a positive relationship between farming experience and the decision of a farmer to adopt modern fertilizer, which means that a unit increase in farming experience will increase the log odd of adoption of modern fertilizer by the farmers the variable is statistically significant at 5% level in explaining the relationship. Therefore, increase in farming experience has 60% probability of increase in adoption of modern fertilizer. The more experienced the farmer is the higher the tendency of their adoption of modern fertilizer as it was with apriori expectation. This is in line with the findings of; Danlami et al. (2016), Dramadri 2005 and Kaburu (2002).

However, the value of the marginal effect for farm size was found to have positive relationship with the probability of modern fertilizer adoption farmers in the study area. An increase in farmer's farming experience will raise the probability of modern fertilizer adoption.

Analysis of Estimate of Tobit Model

One of the objectives of this work is to examine the factors influencing the use intensity of modern fertilizer among irrigation farmers in the study area. Therefore, variables such as marital status, farm size, farming experience, membership of association were found to have influence in determining the response with regards to intensity of fertilizer use as a farming input among respondents as follows:

Table 2.0: Estimated Tobit Model for Fertiliser Use Intensity

Variable	(1) Tobit Model	Robust Standard Error	t-value	P-value
Education	.1329052	.1329052	1.44	0.151*
income_f	-.0370113	.0159186	-2.33	0.021**
income_o	.0320655	.0119874	2.67	0.008***
Fsize	.2566378	.0237527	10.80	0.000***
Assoc	-.8614553	.3102304	-2.78	0.006***
f_experience	.2604689	.0934242	2.79	0.006***
extension_~t	.2983605	.1912608	1.56	0.120*
_cons	1.302556	.8037031	1.62	0.106*

Note: Robust standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1

Table 1 indicates the estimated coefficient for the variables used in predicting the irrigation farmers' use intensity of fertilizer based on Tobit Model. Out of the total number of seven variables included in the model five were found to be statistically significant in explaining the probability of adoption of modern fertilizer by irrigation farmers in Auyo Local Government Area of Jigawa State as follows.

Income from Other Sources: For a unit increase in income from other sources, there is 0.032 point increase in the predicted value of fertilizer use intensity. This explains that the variable is significant at 5% level and have positive relationship with fertilizer use intensity among the respondents. Therefore an increase in farmer's income from other sources have probability of increasing the use of fertilizer to the same proportion. This conforms to apriori expectation that as the income of the farmer increases, more amount of fertilizer will be used. This conforms to a priori expectation of the work and was also in conformity to the work of Obiesan 2013.

Income from Farming: On the other hand, for a unit increase in income from farming, there is 0.037 point decrease in the predicted value of fertilizer use intensity. The farmer's income from farming was found to be significant at 1% level and have negative relationship with the dependent variable. This shows that a unit increase in farmers' income from farming can significantly decrease the amount of fertilizer. This may be due to the fact that farmers often divert their income into trading when their income from farming increases and sometimes even relocate to urban areas. This contradicts the apriori expectation that as the income of the farmer increases, more amount of fertilizer will be used and conforms to a priori expectation of the work and the work of Boniphace, (2015).

Farm Size: The coefficient of the variable is 0.26, which shows a significant and positive relationship between the farms size and the use intensity of fertilizer by the farmers in the study area. The coefficient shows that a unit increase in farm size will increase the fertilizer use intensity by 23.6%, indicating that the more the acres of land is acquired for cultivation, the higher will be the possibility of farmer's decision to increase the amount of modern fertilizer used. These tallies with a priori expectation of the study.

Membership of Association. From the coefficient of the variable, for a unit increase in income from other sources, there is 0.032 point increase in the predicted value of fertilizer use intensity Membership of farmers' association was found to have a positive influence on amount of modern fertilizer to be used. The variable is statistically significant implying that the quantity modern fertilizer used increases with more participation of farmers in the farmers' association in the study area. This might be attributed to the fact that farmers' participation in association activities enlightens them on concentration on farming. This conforms to the apriori expectation of the work and tallies with findings of Danlami (2016), Dramadri (2005).

Farming Experience: the coefficient of the variable indicates a positive and significant relationship between farming experience and the use intensity of modern fertilizer. Therefore, an increase in farming experience has 30% probability of increase in use intensity of modern fertilizer. The more experienced the farmer is the higher the use intensity of modern fertilizer. This is in line with the findings of Boniphace 2015, Obiesan 2013, Thuo 2012.

Constraints to Fertiliser Consumption

The second objective of this study is to identify the obstacles of modern fertilizer adoption experienced by farmers in the study area. Table 2 shows the multiple responses on constraints to adoption of modern fertilizer by irrigation farmers in Auyo Local Government Area.

Table 3: Constraints to Fertilizer Consumption

Constraints	Frequency	Percentage
High cost of fertilizer	272	22.7
Lack of credit facilities	236	19.7
Untimely supply of fertilizer	230	19.2
Hoarding of fertilizer by agents	158	13.2
Inadequate supply of fertilizer	132	11.0
High cost of transportation	96	8.0
Supply of undesired type	72	6.0
Total	1196*	100

Source: Field Survey, 2018 Note: * indicates multiple responses

Table 2 indicates the collection of 1196 responses of the respondents on the various constraints to adoption of modern fertilizer in Auyo Local Government Area. The frequency shows that high cost of fertilizer is most constraining factor with 22.7% of the total responses followed by lack of credit facilities with 19.7%, untimely supply of fertilizer with 19.2%, hoarding of fertilizer by agents with 13.2%, inadequate supply of fertilizer with 11.0%, high cost of transportation with 8.0% and the least is supply of undesired type with 6.0%. This finding shows that all the factors have different level of constraining power to adopting modern fertilizer.

CONCLUSION

This study is centered on adoption of modern fertilizer and its influencing factors among irrigation farmers. Empirical evidence from this study has revealed that majority of the farmers use (adopt) modern fertilizer on their farms. Marital status, farm size, farming experience, meeting with extension workers and membership of farmers' association are factors that significantly and positively determine the farmers' decision to adopt modern fertilizer in the study area. Therefore, ensuring regular extension agents' visit to farmers will improve the intensity of fertiliser use by farmers. The reason is that agricultural extension agents encourage farmers to use more fertiliser by providing information and training on the importance of fertiliser use on farm yields and on how to efficiently use fertiliser. The major factors that serve as obstacle to fertiliser use as perceived by farmers include: untimely supply of subsidised fertiliser, high cost of fertiliser, supply of inadequate quantity of fertiliser as well as hoarding of fertiliser by distributing agents.

RECOMMENDATIONS

- As the study identified number of meeting with extension workers as one of the determinants of adoption of modern fertilizer, the government and other policy makers should increase knowledge and skills of farmers through avenues such as field days, extension agent contact with farmers or any other means of capacity building.
- Rural credit should be emphasized in order to mobilize savings and maximize the availability of credit to the farmers.
- The government and other stakeholders should establish institutions and encourage formation of cooperatives that offer micro-finances and loans to farmers.
- Other sources of income (non-farm) should be provided for farmers to complement their income from farming. This is because the study has found that the relationship between adoption of modern fertilizer and non-farm income is positive.

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RELATIONSHIP BETWEEN ECONOMIC EMPOWERMENT AND THE PERFORMANCE OF RURAL WOMEN ENTREPRENEURS IN JIGAWA STATE

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Abstract

This paper examines the relationship between the economic empowerment and the performance of the rural women entrepreneurs in Jigawa State. Six independent variables (age, marital status, education, level of improvement upon completion of training, total package received and additional equipment purchased) were used in the evaluation of 405 sample women entrepreneur's in three different locations using the multivariate regression model. Result reveals that age, education, level of improvement upon completion of training, total package received and additional equipment purchased included in the model had positive signs and are statistically significant at 1% level while marital status had negative signs. The positive relationships that exist between these variables can be attributed to the fact that the rural women entrepreneurs were able to experience performance in their businesses after enjoying the economic empowerment of Jigawa State. Therefore, the paper recommends that Jigawa State government should re-introduce the programme with more improved packages within the State so as to promote rural women participation in existing and new forms of entrepreneurship, especially to meet up with the drive in the country as well as global entrepreneurial settings.

Keywords: Economic Empowerment, Performance, Rural Women, Entrepreneur, Jigawa State, Nigeria.

INTRODUCTION

Women constitute half of the world's population, yet majority of them do not have access to economic empowerment programme for wealth creation and economic enablement. Economic empowerment is not new to the people living in rural communities of Jigawa State, Nigeria. There have long been many sources of traditional economic empowerment available to promising entrepreneurial ventures, such as *Asusu*, *Adashe*, Family Fund Pool and the activities of the money lenders among others that empowered users, especially women. The system encourages savings and accessing small loans from individuals, friends or relatives, money lenders and groups, within the context of self – help to start different forms of entrepreneurial ventures.

From the creation of the ministry up to 2011, economic empowerment by way of equipment provision, skills acquisition and cash advance, were provided to more than sixty thousand (60,000) beneficiaries across the State. The available data reveals that about 35,000 of the beneficiaries are women, engaged in micro entrepreneurial

activities in tailoring, tie and dye, knitting, shoes and bags production, horse decoration, poultry and fish farming Ministry of Economic Empowerment (MOEE, 2012a).

In June 2012, an assessment was conducted by the Jigawa State Government, by a team of experts drawn from the civil service and the academia to ascertain the status of the beneficiaries operating in different entrepreneurial ventures across the rural communities in the State, the outcome of the survey reveals that only 27,000 women beneficiaries were found to be in operation. Significant proportion of them had their equipment/tools maintained, but with less than 30% of the start-up fund remaining, about 20% of the beneficiaries had recorded an impressive success story, with all the indicators of enterprise performance prevailing Ministry of Economic Empowerment (MOEE, 2012b).

In rural part of North-Western Nigeria and particularly, in Jigawa State, the entrepreneurial activities engaged by women are mostly informal. The reason is largely associated with the fact that informal sector is easy to enter and open to all categories of people wishing to participate in any legal business enterprise found within the communities. Furthermore, the sector is characterized by family ownership of enterprise, labour intensive technique of production and heavy reliance on indigenous resources. They can also conveniently combine their entrepreneurial activities with domestic responsibilities and it does not generally require large capital to establish most of the business in the informal sector (Taiwo, Agwu, Adetiloye & Afolabi, 2016).

The Government of Jigawa State recognizes that rural women have fewer economic opportunities, suffer inadequate access to public financial services, as well as being excluded from socioeconomic decision – making process. This has a “knock-on effect” on households, communities and the wider society. The government has also recognized that to achieve broad-based development the women may require targeted interventions, such as the economic empowerment. The intervention, specifically in 2012, captured the 27,000 women entrepreneurs whose enterprises were sustained from 2008 to 2011 and the sum of ten thousand naira (N10, 000) only was advanced to each of them. The outcome of the financing was expected to empower significantly the women entrepreneur beneficiaries in rural communities of Jigawa State; especially in terms of the growth, profitability, expansion and sustenance of their enterprises. However, experiences and observations on the programme are showing unclear results as majority of the women entrepreneurs in the study areas are still operating at micro level. There is a need, to understand the economic and social changes attained by women beneficiaries in such an environment. Therefore, this study intends to examine the relationship between the economic empowerment and the performance of the rural women entrepreneurs in Jigawa State.

LITERATURE REVIEW

An economic empowerment grant such as the credit support, when provided in sufficient capacities is a catalyst to entrepreneur’s performance (Lakwo, 2007; Ojo, 2009). Credit assistance to entrepreneurs, especially women, often reflects in their improved income, product/output levels, investment, and general improvement in the welfare of the owners and expansion in employment to a certain extent (Peter, 2001; Lakwo, 2007).

Peter (2001) reported that credit assistance impact business performance of entrepreneurs in Kenya positively. But the study did not specify the gender and settlement status of the entrepreneurs. Additionally, Ojo (2009) informed that credit and savings had positive impact on entrepreneurs’ performance in Nigeria. The submission did not focus on rural women entrepreneurs’.

Knowles (2018) reported that personal savings by women entrepreneurs shows positive economic outcomes other than economic empowerment, i.e. savings are a promising way to improve rural women’s performance although less rich than that on loans and grants.

One way of empowering women is through the provision of loans, according to Josephat, Fulment & Matunga (2018) who worked on the relationship between women’s empowerment and microfinance in Kondoa district, Kenya. There are gender stereotypical beliefs about abilities of women to effectively utilize only small loans and inability to engage in a profitable non-traditional self-employment. Their study was conducted in order to examine the women empowerment in Kondoa district and recommend the appropriate ways in which women empowerment could be strengthened or achieved. The data for the study were collected from 415 women among whom 214 were MFIs members whereas 201 were non-MFIs members. The empowerment of women engaged with MFIs was measured in five dimensions which are legal, economic, interpersonal, familial and political. The findings of the study show that women were empowered in economic, interpersonal and familial dimensions. There is no total empowerment among the surveyed women.

Bandiera, Burgess, Gulesci, Rasul, and Sulaiman, (2018) show that a large capital transfer, intensive asset specific training, and regular follow-up visits by an asset specialist and BRAC program officer during a two-year period had a significant, transformative impact on the occupational choices of very poor women in Bangladesh. Bandiera et al. (2018) reported further that these women changed occupational choices from casual day labour to self-employment and increased earnings significantly.

Buvinic and Nichols (2014) reported that micro loans or grants have a positive effect on the performance of male owned firms, but not female-owned firms, this differential effects may be because of subsistent – level at which female firms operate in sectors that face more severe constraints to growth and because women face more pressures than men to spend some of the cash intended for the business for other purposes, or a combination of both.

Using combination of descriptive and inferential statistics, Fafchamps, McKenzie, Quinn and Woodruff (2014) reported that for women with larger businesses, in-kind grants increase their profits, whereas cash grants do not. While for men, cash also has lower impact, but differences between cash and in-kind grants are less robust than for women.

Chukwu (2011) examined the impact of government poverty reduction programme in Suleja Local Government Area, Niger State between 2006 and 2008. Questionnaire, focus group discussion and observation methods were employed in data collection. Descriptive statistics were used to analyse the data. The findings revealed that, the government poverty reduction programme consist of beads making, provision of microfinance loans to the poor and the establishment of various women/youth skills acquisition centre. It shows that some of the poor people in Suleja LGA participated in the programme, and were given loans to establish trading and other income generating outfits. The study further reported that about 43 per cent of the underprivileged, whom the government sponsored programme was supposed to be meant for, were not even aware of the programme. This study did not discuss how the performance of the entrepreneurs is being affected by the empowerment programme.

Woodruff and McKenzie (2018) using a systematic analysis concludes that business training improves business practices for women microenterprise owners but has few measurable effects on business survivorship or profits. Rotech, Charles and Kagai, (2015) positioned that microfinance services have positive effect on the performance of small and medium enterprises especially when the entrepreneurs have acquired skills in their related trade, and further reported that, training in micro enterprises investment was on average satisfactory to the micro entrepreneurs.

Ekpe, Razaq and Mat (2013) employed multivariate techniques on qualitative and quantitative data on women who are engaging in small business to check their performance: credit, training and the moderating effect of attitude towards risk-taking are found to have positive relationship between microfinance interventions and women entrepreneurs' performance found a positive relationship between economic empowerment interventions especially in skill acquisition and women entrepreneurs' performance. Furthermore, Ekpe et al (2013) reported that, without skill acquisition, credit access in itself could not lead to women entrepreneurs' performance. Chakravarty, Mattias, Plamen and Zenker, (2016) reported that, in Nepal, technical and life-skills training combined with job placement support services increased non-farming employment and earnings of young women and men. Their study also reported that, the above factors have positive impact on savings and self-confidence a year after the training ended.

Fiala (2014) reported that men utilization of the training and loans helped ensure that the short-term results observed at six months lasted over nine months. More so, Fiala reports that lack of results for women was attributed to family pressures: married women were drained by family demands for cash, whereas married men employed family members, thus benefiting from close family ties. The study further reports that women who were physically separated from their families benefited from the loan plus training combination.

According to Okechukwu, Nebo and Jude (2016) many women entrepreneurs in developing countries most especially Nigeria are facing disproportionate obstacles due to lack of mobility, capacity and technical skills, with some experiencing several discrimination, hardship and exclusion.

Okechukwu et al., (2016) still in that report, added that women need education, skills, and access to assets/credit, social protection in order to fully develop their productive assets and tackle poverty. Their research is basically self-sponsored work and did not capture any of the government economic empowerment programme in Enugu State.

Eze, Emenyonu, Henri-Ukoha, Oshaji, Ibeagwa, Chikezie, and Chibundu (2016) examined women entrepreneurs' access to economic empowerment through microfinance bank credit in Imo State, Nigeria to determine the socioeconomic characteristics of women entrepreneurs from 2009-2013 and their repayment performance. Descriptive and logit analytical tools were employed on 80 beneficiaries and 71 non-beneficiaries selected from the community with the aid of questionnaire. The mean age of both beneficiaries and non-beneficiaries fell within the productive age range of 42 and 39 years respectively. Their study reported that respondents were middle aged entrepreneurs who are still physically active, vibrant, dynamic and are more likely to adopt innovations better and faster than their older counterparts which increases their performance greatly.

Ayevbuomwan, Popoola and Adeoti (2017) assess the empowerment status of women in rural Nigeria using the multidimensional poverty measure approach and logit regression, reported that the multidimensional women disempowerment index was 0.427, meaning that approximately 43% of the rural women were disempowered. The study reveal that some factors such as the age of the rural women and that of their husband, the employment status of the rural women whether skilled or unskilled increases the probability of empowerment, but other factors like gender of the household headship, the size of the household, location of settlement as well as employment in agriculture and allied sector decreases the probability of women economic empowerment. The study did not distinguish which of the household headship is more advantageous to the other, i.e. male headed or female. It also did not specify which of the sizes, i.e. between smaller and larger household, that affects the empowerment probability of the rural women.

Coleman (2006) reported that women entrepreneurs' do not experience permanent increases in business income from grants received, because they invest very little part of the grants into their business whereas men do experience.

From the studies reviewed in the empirical studies accessible, most of the literatures here focuses on skill acquisition, capacity building, training of one aspect of trade or the other as engaged by the women entrepreneurs, almost none had captured different trades together in measuring their performance together with the four components of economic empowerment. As well, indices of performance were not properly reviewed jointly in the literatures.

METHODOLOGY

Sample size and sampling techniques

The study population comprised of 27,000 rural women entrepreneurs who have benefitted from the Ministry of Economic Empowerment 2008 to 2011 interventions and also enjoyed the 2012 entrepreneurship development support by the government of Jigawa State. The population size is too large to cover; hence the application of Taro Yamane formula was done to arrive at 395 women entrepreneur beneficiaries that were selected using the simple random sampling technique.

The sample population, if divided across the 27 chosen communities will approximately be 15 copies of questionnaire (i.e. $395/27 = 14.63$). Unfortunately there is no fraction of humans. For even distribution of respondents, given the fact that equal numbers of beneficiaries were selected for the intervention, each sampled community in the selected LGA was administered 15 copies of questionnaire. These provided a total of 405 (i.e. $15 \times 27 = 405$). Table 3.1 presents the sample distribution while Figure 3.2 shows the selected communities. The sample size was computed as shown by the Taro Yamane formula, thus:

$$n = \frac{N}{1 + N(e)^2} = \frac{27000}{1 + 27000(0.05)^2} = 395$$

Where; n is the sample size, N is the population, e is the level of precision (Yamane, 1967).

Table 3.1: Sample Size of the Study

S/N	Senatorial Zones	Selected LGAs	Selected Communities	No. of Beneficiaries
1.	Jigawa North East (Hadejia)	Kaugama	Turmi, Marke & Dakaiyawa	15 x 3 = 45
		Kiri-Kasamma	Turabu, Madaci & Kuit	15 x 3 = 45
		Auyo	Auyakayi, Ayama & Gadimari.	15 x 3 = 45
		<i>Sub Total</i>		135
2.	Jigawa North West (Gumel)	Gwiwa	Daurawa, Indirawa & Tsubut.	15 x 3 = 45
		Garki	Muku, Sugungun & Bawan Allah.	15 x 3 = 45
		Gagarawa	Medu, Makerabu & Maikilili.	15 x 3 = 45
		<i>Sub Total</i>		135
3.	Jigawa Central (Dutse)	Buji	Gwadayi, Kukuma & Unguwar Maina	15 x 3 = 45
		Miga	Tsakuwawa, Hantsu & Jamaga	15 x 3 = 45
		Kiyawa	Shuwarin, Balagu & Tsirma	15 x 3 = 45
		<i>Sub Total</i>		135
		Grand Total		405

Method of data analysis

The data generated for the study was analyzed using inferential statistics. Basically, the inferential analytical method would employ the use of multiple regression analysis. At the end of data collection all completed questionnaires from the women entrepreneurs were cleaned, coded and analyzed. Data analysis was performed in order to achieve the research objective.

The multiple regression analysis was employed to achieve this objective. Similar methodology was utilized by Ekpe *et al* (2013) who studied “The performance of female entrepreneurs: credit, training and the moderating effect of attitude towards risk-taking”. Thereafter, the stated hypothesis was tested at 5% level of significance using the F-statistics. The multiple regression model takes the following design

$$INC = \lambda_0 + \lambda_1 AGE + \lambda_2 MST + \lambda_3 EDU + \lambda_4 LOI + \lambda_5 CBT + \lambda_6 TPR + \lambda_7 AEP + \mu_i \quad \dots (1)$$

Where INC = profitability, sustainability and expansion proxied by yearly income

AGE = Age

MST = Marital status

EDU = Educational level

CBT = Capacity building

LOI = Skills proxied by level of improvement upon completion of training

TPR = Cash advance proxied by total package received

AEP = Equipment proxied by additional equipment purchased

EMPIRICAL RESULTS AND FINDINGS

The analytical technique adopted to establish the performance of rural women entrepreneurs is multiple regression analysis. The result of the multiple regression presented in Table 4.1 shows that the coefficient of the variables; age (AGE), education (EDU), level of improvement upon completion of training (LOI), total package received (TPR) and additional equipment purchased (AEP) included in the model had positive signs while marital status (MST) had negative signs. Also, the coefficient of determination (R^2) result for the model was 0.731 which implies that 73.1% of the variation in the performance of women entrepreneur has been explained by the socio-economic characteristics and empowerment factors such as total package received among others and that 29.9% was as a result of the random error term of variables not included in the regression analysis. This implied that the model gave a goodness of fit of the data and that the socio-economic empowerment factors had a relatively significant influence on the performance of rural women entrepreneurs.

Table 4.1: Regression result of rural women entrepreneurs' performance

Dependent Variable: (INC)Income				
Variables	Coefficients	Std. Error	T	Sig.
(Constant)		21346.002	1.030	.304
AGE	.302*	3642.097	7.020	.000
MST	-.143*	6066.438	-3.616	.000
EDU	.271*	2591.826	8.411	.000
LOI	.288*	6804.388	4.421	.000
CBT	.408*	6575.799	9.434	.000
TPR	.009	.144	.217	.829
AEP	.526*	1660.807	12.795	.000

 $R^2 = 0.731$, $F = 149.637$

Source: Author's Computation, (2019). Significant level at 1% (*); 5% (**); 10% (***).

The coefficient of age as a socio-economic variable of the rural women entrepreneurs is positive and statistically significant at 1% level of significance. This implies that holding other variables constant, a unit increase in rural women entrepreneurs' age on the average will increase their performance (i.e. income) by magnitude of 0.302. This finding is consistent with Eze *et al*, (2016) who reported that increase in the age of the rural women entrepreneur increases their performance greatly. This is not surprising because age does not act alone but it grows with other variables like competency, maturity and sound decision making in entrepreneurial activities which also yield positive results and outcomes.

Conversely, the coefficient of rural women entrepreneurs' level of education is $\lambda_3 = 0.271$, has a positive relationship with the dependent variable and statistically significant at 1%. This is in line with the *a priori* expectation. A unit increase in level of education on average tends to increase the income of rural women entrepreneurs by 27.1%. Therefore, enterprises managed by moderately formally educated entrepreneurs are likely to record higher performance by generating more income than those managed by the uneducated. This is because the moderately formally educated women entrepreneurs easily grasp any form of training more than those who are not educated. This conclusion corroborates with the findings of Okechukwu, Nebo and Jude (2016) who reported that women entrepreneur with higher education tends to fully develop their productive assets and tackle poverty. It also agrees with Eze *et al*, (2016). This similarity in the result is owing to the fact that majority of the rural women who are moderately formally educated, have assisted them positively in improving their overall business performance.

Also, the standardized coefficient of entrepreneurs' level of improvement upon completion of training (LOI) has a positive relationship with the dependent variable and is statistically significant too at 1% level. Furthermore, the coefficient of total package received (TPR) is positively related to the dependent variable but is statistically not significant. This implied that a unit increase in total package received holding other variables constant tends to increase the rural women entrepreneurs income by 0.9%, which is negligible and is related to the findings of Ayeubomwan, Popoola and Adeoti (2017) who reported that the economic empowerment received by rural women in Nigeria had positively impacted their business by expanding into medium scale business over a period of five years' time. Besides the negative and low effects of CBT and TPR respectively, after the capacity building training and total package received by the women entrepreneur, the coefficient of additional equipment purchased (AEP) by them is $\lambda_7 = 0.526$. This implied that 52.6% of variation in the level of income of the respondents is a resultant effect of the additional equipment purchased by the entrepreneurs. It means that their adherence to the business environment is positive despite not being attentive to the capacity building training which they are believed to already have prior knowledge.

Similarly, the standardized coefficient of capacity building training (CBT) attained by the rural women entrepreneurs, which is a dummy variable has $\lambda_5 = 0.408$ is positively related to the dependent variable although, statistically significant at 1% level. It implies that, holding other variables constant, a unit increase in capacity building training attained by the entrepreneurs on average tends to increase their income by 40.8%. More of the women had prior knowledge of the chosen trade and therefore gave proper attention to the training as compared to those who are new. Still again, most of the entrepreneurs have attained up to secondary education, thus causing them to understand fully the training they have received. This is contrary to Coleman (2006) who reported that women entrepreneurs' do not experience permanent increases in business income from training and grants received. By this, the State government intervention programme such as that provided by the

ministry of economic empowerment of Jigawa State is important, but when the rural women are provided with different entrepreneurial skills at different times, it could boost their capacities and bring about new form of entrepreneurship into their localities.

The coefficient of marital status of the women entrepreneurs (MST) indicates a negative relationship with the dependent variable but is statistically significant at 1% level. This is in line with the *apriori* expectation, and implied that, when other factors are held constant, a unit increase in marital status of the entrepreneurs on average tends to decrease their income by 14.3%. Married women are restricted due to household activities unlike their unmarried counterparts. More so, when the married women's husband adds another wife (as it's usually the settings in an Islamic location like Jigawa State), there would be more dependency on him thereby causing the women to depend on their own income for other needs. This agrees with Fiala (2014) who informed that women enterprises is affected negatively due to family pressures, as most of them who live in polygamous houses were drained by family demands for cash.

From Table 4.1, the estimated results of the model revealed that, annual income of the respondents (INC) has positive relationships with their age (AGE), Educational level (EDU), level of improvement upon completion of training (LOI), total package received (TPR) and additional equipment purchased (AEP) while marital status (MST) and capacity building training (CBT) are negatively related to their annual income. This means that the model is theoretically meaningful; because most of the parameters are based on the theoretical expectation with the exception of CBT which is expected to have a positive relationship with INC. This is because, increase in level of capacity building will lead to an increase in income earned by the entrepreneurs, all things being equal. The model is fully supported by empirical findings of other similar studies conducted including; Coleman (2006); Eze et al, (2016); Fiala (2014); Okechukwu, Nebo & Jude (2016); Ayevbuomwan, Popoola & Adeoti (2017).

Hypothesis testing

Table 4.2: Summary of ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	2497019283387.382	7	356717040483.912	149.637	.000 ^b
	Residual	920177226764.912	386	2383878825.816		
	Total	3417196510152.294	393			

Source: Author's Computation, 2019.

Based on the result and the hypothesis formulated for this study, Table 4.2 showed the F-value of (149.6) and the group probability level 0.00 at 5% level of significance. The result therefore indicated that economic empowerment factors have positive impact on the performance of rural women entrepreneurs in Jigawa State. Hence, the null-hypothesis which says that there is no significant relationship between economic empowerment and the performance of rural women entrepreneurs in Jigawa State was rejected.

CONCLUSION AND RECOMMENDATIONS

Based on the findings of this study, it could be concluded that there was impact of economic empowerment on performance among rural women entrepreneurs in Jigawa State, Nigeria, through the increase in the profit level, income level, savings, and employment generation of their respective enterprises. In general there was significant impact of economic empowerment on performance of rural women entrepreneurs compared to what they were before the intervention. For the entrepreneurs to achieve better performance, they should learn how to judiciously manage the little resources at their disposal.

Result of the study revealed that there was a positive impact of economic empowerment on entrepreneurial performance of rural women entrepreneurs in Jigawa State. It is recommended that Jigawa State government should re-introduce the programme with more improved packages within the State so as to promote rural women participation in existing and new forms of entrepreneurship, especially to meet up with the drive in the country as well as global entrepreneurial settings.

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APPENDIX: Performance Model**Model Summary^b**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.855 ^a	.731	.726	48824.982	.731	149.637	7	386	.000	2.132

a. Predictors: (Constant), AEP, EDU, TPR, MST, LOI, AGE, CBT

b. Dependent Variable: INC

ANOVA^a

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	2497019283387.382	7	356717040483.912	149.637	.000 ^b
	Residual	920177226764.912	386	2383878825.816		
	Total	3417196510152.294	393			

a. Dependent Variable: INC

b. Predictors: (Constant), AEP, EDU, TPR, MST, LOI, AGE, CBT

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	21983.977	21346.002		1.030	.304
	AGE	25568.025	3642.097	.302	7.020	.000
	MST	-21933.547	6066.438	-.143	-3.616	.000
	EDU	21800.772	2591.826	.271	8.411	.000
	LOI	30081.764	6804.388	.288	4.421	.000
	CBT	62038.936	6575.799	.408	9.434	.000
	TPR	.031	.144	.009	.217	.829
	AEP	21250.528	1660.807	.526	12.795	.000

a. Dependent Variable: INC

Residuals Statistics^a

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-8662.26	332360.56	119428.93	79710.342	394
Residual	-86353.266	122963.742	.000	48388.200	394
Std. Predicted Value	-1.607	2.671	.000	1.000	394
Std. Residual	-1.769	2.518	.000	.991	394

a. Dependent Variable: INC



VOCATIONAL EDUCATION STUDENTS' PERCEPTION OF ENTREPRENEURSHIP EDUCATION SKILLS AS PROGNOSTICATORS OF BUSINESS START-UP AT JIGAWA STATE COLLEGES OF EDUCATION GUMEL

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Abstract

The study empirically investigated the Vocational education students' perception of entrepreneurship education skills as prognosticators of business start-up at Jigawa state colleges of education Gumel. In order to investigate this study, two (2) research questions and two (2) hypothesis were raised for the study. Related literature was reviewed and the entrepreneurial event model (EEM) developed by Shapero and Sokol in 1982 was adopted as the conceptual framework for the study. The framework showed at a glance the various stages and processes that eventually climaxed into business formation. The survey design was used in the study. Six hundred and twenty eight (628) vocational education students from Agricultural education, Business education, Fine and Applied Art education, and Home economics education in the college formed the population of the study out of which a sample size of one hundred and fifty seven (157) students were selected using the proportionate stratified random sampling technique. The instrument used for data collection was the questionnaire title: Vocational Education Students' Perception of Entrepreneurship Education Skills Questionnaire (VESPEESQ) and it was divided into two sections – A and B. Section A consists of the demographic information of the respondents while section B consist of thirteen (13) opinion statements structured in a 4-point rating scale. The instrument was validated by experts in the school of secondary education (vocational and technical education programme), Jigawa state college of education, Gumel and the test re-test method of reliability was used in obtaining reliability co-efficient of 0.78. The instrument was administered to the respondents with the help of research assistants and the data collected was subject to statistical analysis. The descriptive and inferential statistical tools were used in analysing the data. The data generated for the study were analyzed using simple percentage, mean and standard deviation to answer the personal data and research questions while the null hypotheses were tested at 0.05 level of significance using t-test with inferential statistic of SPSS version 21. The findings revealed that the respondents have positive perception towards entrepreneurship education. It also revealed that there are challenge plaguing the acquisition of entrepreneurial knowledge and skills such as lack enough practical, lack of adequate facilities etc. Among the recommendations advanced by the researchers was that, there should be conscious efforts by educators to properly transmit the entrepreneurial skills to the learners with ease, practical examples should be included in the lectures, teachers should maintain cordial relationship with their students so they can be able acquire the required knowledge and skills of entrepreneurship education.

Keywords: Entrepreneurship education, vocational education, entrepreneurial skills, entrepreneurship education perception.

INTRODUCTION

The teaching and learning of Entrepreneurship Education in tertiary institutions is of paramount interest to all stakeholders. The National Policy on Education describes Education as an instrument „par excellence“ for effecting national development (FRN, 2004). It is conceived that education is capable of bringing about the desired socio-economic and political changes in the country. The recent call for the inclusion of Entrepreneurship Education in tertiary educational institutions in Nigeria is an indication of its importance to employment creation; as Nigeria continues to churn out graduates from our various institutions that are hardly self-reliant but solely dependent on white collar jobs for sustenance because they lack adequate skills that will make them function effectively and efficiently towards the development of the economy (Ayodele, 2017).

The Federal Government made the programme compulsory for students of higher education institutions irrespective of area of specialization and in most tertiary institutions, entrepreneurship education has been adopted as a compulsory general studies course for students. The overall objective is to continuously foster entrepreneurship culture and spirit amongst students and faculty with a view of educating them as well as supporting graduates of the system towards establishing and also maintaining sustainable business ventures (Odeh & Okoye, 2014). The Minister of education stressed that the National Universities Commission (NUC) was given presidential directives by the Ministry of Education to supervise and coordinate the programme of introducing entrepreneurship education in Nigerian institutions of higher learning in collaboration with all regulatory bodies of higher institutions - the National Board for Technical Education (NBTE), National Commission for Colleges of Education (NCCE) to be handled by the committee set up by the Federal Government.

As a nation, Nigeria has been working tirelessly since the collapse of oil boom to achieve youth independence, poverty eradication and improved economic status through several reforms and programme initiatives such as the Operation Feed the Nation (OFN), National Poverty Eradication Program (NAPEP), Structural Adjustment Programme (SAP), National Directorate of Employment (NDE) among others. Regrettably, however these programme initiatives aimed at capacity building and utilization seem not to have helped in any way to equip young school leavers (Youths) with appropriate skills that will empower them after graduation from school (Okolocha & Okolocha, 2012).

The essence of entrepreneurship education is to build in the students“ entrepreneurship spirit and culture (Akpomi, 2009; Adejimi & Olufunmilayo, 2009). Entrepreneurship education has emphasis on education for self-employment rather than education for paid employment. This kind of education has become so important in Nigeria owing to the high level of unemployment coupled with its accompanying social vices and unrest. It is believed that this kind of education is capable of meaningfully engaging the individuals and making them more productive and useful to themselves and the country at large.

The growth and development of the economy depends largely on the kind of skills that the graduates of our educational institutions are equipped with. According to Ihebereme (2010), skill acquisition is the process of acquiring or gaining effective and ready knowledge in developing ones aptitude and ability in a particular field. Skill acquisition is one among the policies embarked upon in Nigeria with the sole aim to alleviate poverty, youth restiveness, sophisticated crime and corruption rate; rural – urban drift, unemployment and other social vices (Ihebereme, 2010). Skill acquisition in Nigeria tertiary education level is meant to equip our students with more practical and less theoretical knowledge on income generating skills.

Mbionwu (2008) noted that when youths are given adequate training in skills, they can be self-employed after schooling; hence they become active partners in both community and national development. The possession of skill is important in preventing youths from becoming social misfit. Ihebereme (2010) opined that skill acquisition (Entrepreneurship) education in Nigerian educational system acts as a rehabilitator, re-orientator, and motivator and empowered to the under-privileged (students of poor parents). These skills are described as entrepreneurial skills (Akudolu, 2010).

Okolocha and Okolocha (2012) described entrepreneurship skills as business skills which one acquires to function effectively in the turbulent business environment as an independent or self-employed person in order to improve one’s economic status and the society at large. The result of the study carried out by Okebukola (2016) confirmed that most Nigerian graduates are deficient in self-reliance and entrepreneurial skills. In a similar vein, Anyakoha (1997) as cited by Olagunju (2014) stressed that training for entrepreneurship skill development is not currently well articulated by Nigerian colleges of education. The importance of entrepreneurial skill cannot be over-emphasized since appropriate skill acquisition through entrepreneurship will help to make young school leavers“ to be self-reliant and boost their economic states.

Entrepreneurship education which is a sort of intervention programme which was introduced into Nigeria's tertiary education sub-sector in 2006 to remedy the unemployment challenge; and redirect the attention of our youths/graduates towards job creation by instilling in them relevant entrepreneurial skills that will positively grow and develop the economy. The goals and objectives of the programme seem laudable and for these goals and objectives to be achieved, some machinery has to be put in place. The relevance of this programme in the curriculum of all tertiary institutions in Nigeria is geared at creating an entrepreneurial culture and entrepreneurial spirits in the students. Since the introduction of this programme, there seems to be increase in graduates' unemployment. For instance, the unemployment rate as at 2006 was 5.3 percent but as at 2011, it has risen up to 23.9 percent. Many graduates seem to be roaming the streets in search for white collar jobs. The rate of poverty, corruption and so many other social vices has become worrisome to the government and to every well-meaning citizen despite the introduction of entrepreneurship education. This state of affair is of great concern to the researchers and if this trend continues, it will leave no one in doubt to question the relevance of entrepreneurship education in the school curriculum.

Objective of the Study

The main purpose of the study is to find the Vocational education students' perception of entrepreneurship education skills as prognosticators of business start-up at Jigawa state colleges of education Gumel. The study also ought to;

1. Assessed the extent to which entrepreneurial studies had relevance in stimulating vocational education students' interest.
2. Identified the perception of vocational education students on the challenges facing the acquisition of skills in the areas of entrepreneurial studies.

Theory of Skill Acquisition by Hubert and Stuart Dreyfus (1986)

Dreyfus and Dreyfus (1986), propounded the theory of skill acquisition which states that formal system of education is a gradual process that involves being embodied in different ways and developing skills that would make it possible for people to deal with the world. The main idea behind Dreyfus and Dreyfus's skill development theories is the distinction they made between "knowing that" and "knowing how". The knowing-how and knowing-that is considered one concept, which is acquired through a formal system of education (Odeh & Okoye, 2014).

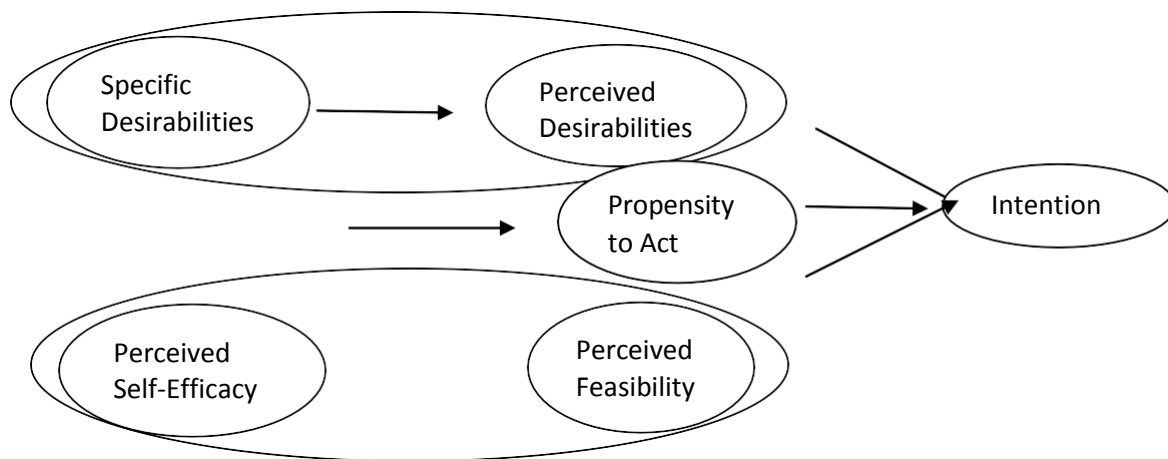
Dreyfus and Dreyfus in the article "Five stages from Novice to expert," stated that human beings acquire skills through instruction and experiences, they do not appear to leap suddenly from rule-guided "knowing that" to experience-based knowing-how. Hubert and Stuart believe that there is a gradual process involved for a student to go through in order to reach the stage of expertise or knowing-how. Their skill acquisition process shows that a student goes through at least five stages of different knowledge of a specific task and ways of decision-making as he improves his skill. These five stages are; novice, advanced beginner, competence, proficiency, and expertise.

Entrepreneurial Events Model (EEM) Theory

Shapero and Sokol (1982), advanced a process model of new venture formation which included what they called a displacement event. They argued that in activity guided human action and as a result there needed to be a displacing event to push or pull an individual to change course, and in this case to found a business. This displacement has also been called the 'trigger' or 'precipitating' event. This model is more dynamic and suggests that entrepreneurial intention is based on the interaction between personal characteristics, perceptions, values, beliefs, background and environment (situational context). The authors base this approach on a model of the entrepreneurial event in which entrepreneurship is defined as the pursuit of an opportunity irrespective of existing processes. This approach incorporates the influence of environment, and the notion that entrepreneurial behavior is planned and intentional. This approach is process-focused in that the interactions of several factors are examined in order to predict that behavior, beliefs, perceptions and assumptions are learned within the context of a given environment (such as a business or community). These attitudes and perceptions predict intentions, which in turn influence behavior. Entrepreneurial intention is thus mediated in the following manner: Environment or event causes an individual to form perceptions, attitudes and assumptions (consider the assumptions and beliefs that might be formed in a change-oriented environment as opposed to a static environment). These perceptions then translate themselves into intentions, or potential. Intentions or potential then are expressed through behavior. Thus, this model suggests that entrepreneurial characteristics not only can be learned, but also can vary across individuals and situations. They sought to identify key social factors that led to what they called 'entrepreneurial events', or the act of starting a business. Central to their model were the perceptions by the individual of the desirability and feasibility of launching a new venture combined with some propensity to act on opportunities, and then triggered by a displacement event.

While many variables would be expected to influence an individual's intentions to act in a certain way, research supports the mediating effect of the three variables outlined in the model, namely perceived desirability, perceived feasibility and propensity to act (Krueger, 1993).

This process model is relevant to vocational education NCE students who are aiming at becoming skillful for successful and sustainable business undertakings and self-employed or self-reliant since several career opportunities are opened to them for consideration of different paths that they could choose from. Any path being considered had to be perceived as not only desirable but feasible, and that there had to be some general propensity to act on an alternative. The conclusion by NCE vocational education students that an alternative was attractive and doable was an insufficient condition to action; hence, there must be some predisposition to act on opportunities for a new venture startup to actually take place. Events that could make a vocational education student take to self-employment and self-reliant according to Shapero and Sokol (1982), are conceptualized as situations, positive, such as an opportunity is presented to get into business for one self, or negative, such as being laid off from a job, or more neutral as in life-transition situations, such as graduating from college. To them, these were necessary to break people out of the 'ruts' they develop over time. In terms of family business, the transition event could be viewed as the displacement event that would possibly trigger the entrepreneurship in offspring who otherwise considered other options in life. The demise of the founder for instance could become the event that as a matter of necessity, one has to take over the family firm even if they did not wish to. This process model also explained why some of the vocational education students would not like to become self-employed or self-reliant, instead they prefer to go about searching for those teaching or administrative jobs, or better still, their preference for working for someone else.



Shapero's Model of Entrepreneurial Event
Source: Ogundele, Sofoluwe & Kayode (2012).

Empirical Review

Students' Interest and Business Start-ups

The entrepreneurial activities engaged in entrepreneurship education should stimulate student's interest in entrepreneurship and activities involving business startups. This was supported by the study of Arasti, falavarjani, and Imanipour (2012) that focused on the suitable teaching methods in entrepreneurship education by carrying out two qualitative studies. The authors concluded that the appropriate teaching methods for teaching the course are group project, case study, individual project, development of a new business creation project and problem-solving. In the same vein, Malach and Malach (2014) examined the experiential entrepreneurship education approach highlighting the —Start Your Own Business. Assignment in the context of the entrepreneurship course offered to over 200 undergraduate students per year at the Haskayne School of Business, University of Calgary, Canada. The findings of the study suggests that experiential education in entrepreneurship courses, conveys both substantive, theoretical knowledge and intangible learning experiences best absorbed through active participation. The authors concluded that starting and operating a business is a unique, educational experience which allows students to apply the substantive knowledge gained in entrepreneurship courses to a real business.

Knowledge, Skills and Competencies

Andrews and Higson (2008), in Abanyam (2014), carried out a study to conceptualize and identify key individual – and business related skills and competencies required by employers of business graduates and holders of other higher level qualifications, and to discover whether higher education business programs are meeting the needs of the European market place. Utilizing semi-structured interview techniques, a total of fifty people were interviewed across all four countries, thirty business graduates and twenty employers. The graduate interview questions focused on individual's experiences of making the transition from education to employment and were themed in to five different areas: perceptions of current employment situations; reflections on higher education; experiences of work-based learning and other work; possession of business focused skills and competencies; and the usefulness of interpersonal and communication skills and competencies. The employer questionnaire followed a similar approach focusing upon: graduate recruitment issues including training and formal graduate employment schemes; perceptions of, and organizational links with higher education; key business skills and competencies expected of graduates within the work environment; and interpersonal and communication skills and competencies. It was found that the graduates' perceptions, whilst contextually different, were remarkably analogous, whilst employers' perceptions of the skills and competencies necessary to enhance graduate employability were similar in all four countries. This study, which identifies key individual and business related skills and competencies required by business graduates to discover whether higher education business programs are meeting the needs of the European market place, is related to the current study since both studies are on skills required for employment. However, while the current study will determine the level of entrepreneurial skills possessed by NCE vocational education students for self-employment and self-reliant, the reviewed study identify key individual and business related skills and competencies required by business graduates. Thus, this study will provide information to the researcher in identifying skills needed for successful and sustainable business undertakings.

METHODOLOGY

This study adopted descriptive survey research design since it was basically an enquiry into the perception of vocational students on entrepreneurial skills. This is in agreement with Nworgu (1991) as cited in Omoroguiwa (2006) that a research survey is one in which a group of people or items is studied by collection and analyzing data from only a few people or items considered to be representative of the entire population. The population of this study consisted of all year three Vocational Education students (i.e. agricultural education, Business education, Fine and Applied Art education, and Home Economics education) that offered Entrepreneurship Education in Jigawa State Colleges of Education, Gumel. The total population was 628 students. A sample of one hundred and fifty seven students representing 25% of the total population was used for the study. The proportionate stratified random sampling technique was used in drawing up the sample from the entire population and which is considered to be representative of the whole population. This is in view of Omoroguiwa (2006). The instrument used for this study was a well-structured questionnaire which was divided into two parts – A and B. Part A consisted of the demographic variables of the respondents while part B consists of two (2) sections with twenty one (21) opinion statements designed in a 4-Point Rating Scale showing „SA“ (Strongly Agreed), „A“ (Agreed), „D“ (Disagreed) and „SD“ (Strongly Disagreed). The descriptive statistics used includes frequencies, percentages, mean and standard deviation in answering all the research questions, while t – test was used in analyzing the hypothesis formulated for the study at 0.05 level of significance. Any mean value of 2.50 and above was considered as accepted while below 2.50 was considered as rejected.

Table 1: Distribution of Population and Sample of Vocational Education Students in Jigawa State Colleges of Education, Gumel.

Departments	Population	Sample
Agricultural Education	222	50
Business Education	255	50
Fine and Applied Art Education	95	30
Home Economics Education	56	27
Total	628	157

Source: Departmental Levels Coordinators

Results and Discussions

Answering Research Questions

Table 2: Respondents' Demographic Information

	Variables	Frequency	Percentage
Sex distribution of students	Male	83	52.9
	Female	74	47.1
Age distribution of students	17 to 18 years	2	1.3
	19 to 20 years	81	51.6
	21 years and above	74	47.1
Course of study	Agric. Science Education	50	31.8
	Business Education	50	31.8
	Fine and applied art education	30	19.1
	Home Economics Education	27	17.2
Distribution of students' sponsorship	Self	35	22.3
	Parent/guardian	112	71.3
	Scholarship	10	6.4
Distribution of student's family economic background	Low	30	19.1
	Medium	115	73.2
	High	12	7.6
Students' family major occupation	Farming	116	73.9
	Trading	17	10.8
	Carpentry	3	1.9
	Other	21	13.4
Students major area occupation	Farming	137	87.3
	Fishing	5	3.2
	Blacksmith	10	6.4
	Other	5	3.3
Distribution of students' response on whether they have future business plan	Yes	150	95.5
	No	07	4.5
Students' future business plan	Trading	2	1.3
	Farming	83	52.9
	Catering services	17	10.8
	Computer services	26	16.6
	Other	29	18.5

Field Survey, 2019

From the table 2 above it is indicated that 52.9% of the respondent were males while 47.1% of the total population were females. The age categories of the respondents indicates that 1.3% of them were between the ages of 17 to 18 years, 51.6% were between 19-20 years of age and 47.1% of them were 21 years and above this indicates that majority of the respondents are matured enough to choose their capable occupation. The course of study of the respondents showed that Agricultural science education and Business education students constitutes 31.8% of the population each, were 19.1% of respondents study fine and applied art education, and 17.2% of them study Home economics education. This was obtained as on the total number of the students to each department. It shows the sponsorship of the respondents, where 22.3% of the respondents are self-sponsored, 71.3% of them where sponsored either by parents or guardian, while 6.4% of them were on scholarship. This indicated that majority of the respondents were sponsored by parents or guardian. On the family Economic background of the respondents it showed that 19.1% of them where from low family economic background 73.2% are from medium, while 7.6% of them are from high. This indicates that majority of them were from average economic background this will make them to have the courage and interest to learn more about entrepreneurship so as to become self-reliant. Results also indicates the major family occupation of the respondents where 73.9% indicates farming, 10.8% trading, 1.9% carpentry while 13.4% of them indicates others which includes fishing, tailoring, civil service, commercial motor driving, black smith welding and none. It also showed the area major occupation of the respondents, where 87.3% of them indicates fishing, 6.4% indicates blacksmith, while 3.2% of them indicates other which includes trading, pottery, civil service and carpentry. While about the future business plan of the respondents it showed that 95.5% of them have future business plan whereas only 4.5% of them have no future business plan. This shows the significance and appreciation of the entrepreneurial studies they have gone through. It also shows the types of entrepreneurial future business plan the students have planned to embark on after graduating where 52.9% of them indicates

farming, 10.8% catering services, 16.6% computer service, while 18.5% of them indicates others which include tailoring, carpentry, building, graphics and textile, painting, iron welding and saloon.

Research Question 1: To what extent do entrepreneurial studies have relevance in stimulating male and female vocational education students' interest to entrepreneurial business?

Table 3: Result of the extent to which entrepreneurial studies have relevance in stimulating male and female vocational education students' interest to entrepreneurial business

Statement	Sex	F	Df	X	SD	S. E. x	t-cal	Decision
Majority of students including myself consider entrepreneurship education classes very desirable	M	83	155	3.506	.5030	.5552	-0.419	Accepted
	F	74		3.541	.5284	.0614		Accepted
Many students engage themselves stylishly with other activities during entrepreneurship education classes	M	83	155	3.306	.7399	.0812	-1.645	Accepted
	F	74		3.230	.7318	.0851		Accepted
Students interest to pursue entrepreneurship ventures in the school are aroused through the entrepreneurial unit	M	83	155	3.108	.8266	.0907	-1.644	Accepted
	F	74		3.311	.7008	.0815		Accepted
My entrepreneurial lecturers helped and encourage me to meet people with good ideas for new ventures.	M	83	155	3.566	.5884	.0646	-1.254	Accepted
	F	74		3.689	.6395	.0743		Accepted
I consider entrepreneurship class as an ideal place to learn about how to start a business	M	83	155	3.458	.7037	.0772	-0.866	Accepted
	F	74		3.554	.6853	.0797		Accepted
My entrepreneurial studies lecturers stimulate my interest in	M	83	155	3.906	.6917	.0759	-1.720	Accepted
Entrepreneurship formally and informally	F	74		3.297	.7716	.0897		Accepted

Field Survey, 2019

Average mean = 3.46

Table 3 above reveals that when respondents were asked if entrepreneurship education classes is considered very desirable by students, most of the respondents from all categories of students, responded affirmatively to the statement. The analysis in the table shows that the mean scores for male students is 3.506 and the mean score for female students is 3.541. This shows that the vocational education students do appreciate entrepreneurship education classes. The table indicates that when respondents were asked if students engage themselves stylishly with other activities during entrepreneurship education classes, majority of the respondents from all categories of students acknowledged the statement. The analysis shows that the mean scores for male and female students are 3.306 and 3.230, respectively. This implies that more respondents acknowledge that engaging themselves to other activities during entrepreneurship education classes has enhanced students to create more interest in entrepreneurship. The table also reveals that most respondents from all categories of students affirmed that entrepreneurship students' interest to pursue entrepreneurship ventures in the school is aroused through the entrepreneurial unit. The analysis shows that the mean scores for male and female respondents are 3.108 and 3.311 respectively. The table shows that when respondents were asked if entrepreneurial lecturers helped and encourage vocational education students to meet people with good ideas for new ventures, majority of the respondents from both students category responded favourably to the statement. The analysis shows that, the mean scores for male and female vocational education respondents are 3.566 and 3.689, respectively. The table indicates that when respondents were asked if they consider entrepreneurship class as an ideal place to learn about how to start a business, majority of the respondents from both students category acknowledge the statement. The analysis shows that the mean scores for male and female vocational education students are 3.458 and 3.554 respectively. The table also revealed that when respondents were asked if entrepreneurial education lecturers stimulate vocational education students' interest in entrepreneurship formally and informally, majority of the respondents from both male and female vocational educational students responded positively to the statement. The analysis showed that the mean scores of male vocational education students was 3.906 while that of female respondents is 3.297. The result suggests that more respondents within the students category opined that exposure to entrepreneurship education has enhanced vocational education students to create interest in legitimate business ventures. This results is in line with the study of Odiya and Odiya (2013) which indicated that the development of appropriate teaching methods has implications for student's business start-up.

Research Question 2: What are the perceptions of vocational education students on the challenges facing the acquisition of skills in the areas of entrepreneurial studies?

Table 4: Result of the extent of perceptions of vocational education students on the challenges facing the acquisition of skills in the areas of entrepreneurial studies.

Statement	Sex	F	Df	X	Sd	S. E. x	t-cal	Decision
I was able to develop entrepreneurial knowledge, skills and competencies through entrepreneurship courses that I attended.	M	83	155	3.446	.6296	.0691	-2.052	Accepted
	F	74		3.635	.5122	.0595		Accepted
As a result of taking courses on entrepreneurship, I have better understanding about business	M	83	155	3.337	.5245	.0576	-2.466	Accepted
	F	74		3.554	.5768	.0670		Accepted
Through entrepreneurship lectures, I have learnt how to prepare a business plan	M	83	155	3.506	.5921	.0650	1.573	Accepted
	F	74		3.338	.7453	.0866		Accepted
Through entrepreneurship lectures, I have learnt to approach banks and other financial institutions for financial support.	M	83	155	3.181	.7349	.0807	-0.849	Accepted
	F	74		3.284	.7855	.0913		Accepted
Through entrepreneurship lectures I have learnt how to register a patent and register a business	M	83	155	3.253	.6409	.0704	-0.285	Accepted
	F	74		3.284	.7123	.0828		Accepted
As a result of exposure to entrepreneurial classes and activities many students including myself are considering starting a business of our own	M	83	155	3.446	.5896	.0647	-0.276	Accepted
	F	74		3.473	.6458	.0751		Accepted
Through exposure to entrepreneurial classes and activities I have been able to start a business of my own	M	83	155	3.120	.6699	.0735	-3.527	Accepted
	F	74		3.486	.6247	.0726		Accepted

Field Survey, 2019

Average mean = 2.915

Table 4 above indicates that, when respondents were asked if students were able to develop entrepreneurial knowledge, skills and competencies through entrepreneurship courses they attended, most of the respondents from all categories of students, responded affirmatively to the statement. The analysis in the table shows that the mean scores for male students is 3.446 and the mean score for female students is 3.635. The table indicates that, when respondents were asked if as a result of taking courses on entrepreneurship they have better understanding about business venture, majority of the respondents from all categories of students acknowledged the statement. The analysis shows that, the mean scores for male and female students are 3.337 and 3.554, respectively. This implies that, more respondents acknowledge that the study of entrepreneurship education plays an important role in making the students to have better understanding of business venture. The table also reveals that, most respondents from all categories of students affirmed that through entrepreneurship lectures, they have learned how to prepare a business plan. The analysis shows that, the mean scores for male and female respondents are 3.506 and 3.338 respectively. The table shows that, when respondents were asked if through entrepreneurship lectures they have learnt how to approach banks and other financial institutions for financial support, majority of the respondents from both students category responded favourably to the statement. The analysis shows that, the mean scores for male and female vocational education respondents are 3.181 and 3.284, respectively. The table indicates that, when respondents were asked if through entrepreneurship lectures they have learnt how to register a patent and register a business, majority of the respondents from both students category acknowledge the statement. The analysis shows that, the mean scores for male and female vocational education students are 3.253 and 3.284 respectively. The table also reveal that, when respondents were asked if as a result of exposure to entrepreneurial classes and activities many students starts considering how to set up a business of their own, majority of the respondents from both male and female vocational educational students responded positively to the statement. The analysis shows that, the mean scores for male vocational education students is 3.446, while that of female respondents is 3.473. The table also indicates that, when respondents were asked if through exposure to entrepreneurial classes and activities they have been able to start a business of their own, majority of the respondents from both male and female vocational educational students responded positively to the statement. The analysis shows that the mean scores for male vocational education students is 3.120, while that of female respondents is 3.486.

Test of Hypotheses

This section was concerned with the analysis and presentation of the data regarding the hypothesis. The independent t-test was used in the analysis of the hypothesis with respect to the two samples. The level of significance was 0.05.

Decision rule: Null hypotheses are accepted when t-calculated values (t-cal) are less than t-tabulated values (t-tab) and vice versa.

Ho1: There is no significant difference in the mean response of male and female vocational education students' interest in entrepreneurial business startup.

Table 5: T-test result of hypothesis one

Variable	N	Mean	STD	t-cal	t-tab	Df	Remark
Perceptions of male vocational education students	157	3.29	0.66	-1.27	12.706	155	Not Significant
Perceptions of female vocational education students		3.43	0.69				

Field Survey, 2019

From the table 5 above, it is shown that the t-calculated value (t-cal) -1.27 is less than the t-tabulated value (t-tab) 12.706 at 0.05 level of significance. In view of the decision rule, the stated null hypothesis that there is no significant difference in the mean response of male and female vocational education students' interest in entrepreneurial business startup is accepted. This showed that there is no difference in the interest perception of male and female vocational education students.

Ho2: There is no significant difference in the mean responses of male and female vocational education students in the challenges confronting the acquisition of entrepreneurial skills.

Table 6: T-test result of hypothesis three

Variable	N	Mean	STD	t-cal	t-tab	Df	Remark
Perceptions of male vocational education students	157	3.33	0.63	-1.00	12.706	155	Not Significant
Perceptions of female vocational education students		3.44	0.67				

Field Survey, 2019

From the table 6 above, it is shown that the t-calculated value (t-cal) -1.00 is less than the t-tabulated value (t-tab) 12.706 at 0.05 level of significance. In view of the decision rule, the stated null hypothesis that there is no significant difference in the mean response of male and female vocational education students in the challenges confronting the acquisition of entrepreneurial skills. Based the result in the table above, it can therefore be concluded that male and female vocational education students have no difference in the acquisition of entrepreneurial skills in Nigerian colleges of education.

Discussion of Findings

The analysis of the research questions raised in the study and the hypothesis have revealed some interesting findings that are worth considering and discussion based on some relevant literature to either corroborate or contradict the findings. They are discussed thus:

The findings from research questions showed that both male and female vocational education students have positive perception of the entrepreneurship education programme in Jigawa state college of education Gumel since the programme covers relevant aspects knowledge and skills and that the objectives of teaching entrepreneurship education studies are adequately taken care of.

Findings from the research question one revealed that teaching methods in entrepreneurship significantly stimulate students, interest and business start-ups. The findings from the respondents showed that most respondents agreed that there is a commonality of purpose and interest among vocational education

entrepreneurship students. The findings also indicated that most respondents agreed that the entrepreneurship course has enhanced students to create new business processes. This shows that the adoption of practical activities considered as best practices in entrepreneurship teaching, can facilitate business start-ups by stimulating students' interest with active real world activities. This is in line with the work of Arasti, Falavarjani, and Imanipour (2012) who recommended that the appropriate teaching methods for entrepreneurship course include practical activities such as; group project, case study, individual project, venture creation project, and problem-solving. The findings of some studies such as Wang and Wong (2004), supported by Hamidi, Wennberg, and Berglund (2008) also suggests that participation in an entrepreneurship programme is averse to the development of students' interests and business start up potentials. This study counters this stance based on the findings from this research which suggests that using the appropriate teaching methods and best practices in entrepreneurship teaching, may motivate students' interest for business startups in the course of the programme.

The analysis of the research question two revealed that entrepreneurial skills have relevance in entrepreneurship. It showed that the possession of human relations and managerial skills acquired have relevance in starting and managing an entrepreneurial venture. The findings also stressed that the possession of marketing or sales and general business skills as a result of entrepreneurship education have relevance in starting up and managing a business venture; and ensuring entrepreneurial success. This finding is in agreement with Ewubare (2010) where the author stressed that entrepreneurial skills have relevance in creating and developing enterprises in various areas. The finding is also widely supported by Akudolu (2010).

The first hypothesis of the study stated there is no significant difference in the mean response of male and female vocational education students' interest in entrepreneurial business startup. This hypothesis was accepted due to the fact that the t-calculated value of -1.27 was less than the t-tabulated value of 12.706 at 0.05 level of significance. This showed that there is no difference in the interest perception of male and female vocational education students. Perceptions, according to Ihebereme (2010), refers to an individual's current appraisal of an object or programme and in the report of Hamidi, Wennberg, and Berglund (2008) suggests that participation in an entrepreneurship programme is averse to the development of students' interests and business startup potentials.

Hypothesis two state that there is no significant difference in the mean responses of male and female vocational education students in the challenges confronting the acquisition of entrepreneurial skills. The null hypothesis was accepted because of the fact that the t-calculated value of -1.00 is less than the t-tabulated value of 12.706 at 0.05 level of significant. This finding is in agreement with Ewubare (2010) where the author stressed that entrepreneurial skills have relevance in creating and developing enterprises in various areas. This clearly indicated that the acquisition of entrepreneurial education skills can reduce the country's dependency on other countries in terms of goods and services since the youth were equipped with adequate and required skills to be self-reliant.

CONCLUSION

The Findings from the study revealed that the entrepreneurship education programme in Jigawa state college of education Gumel is operational in the college. The findings of the study further revealed that entrepreneurship education plays an important role in stimulating youth interest to acquire the desired skills which guide them in the business start-up which promote their standard of living by being self-employed or self-reliant in order to bring desired change in the nations' economy. The study also found that both male and female vocational education students have positive perception on entrepreneurship education since the programme inculcate the spirit of business startup by making the youth to develop better interest in business venture. The study revealed that there are certain challenges plaguing the acquisition of required entrepreneurship knowledge and skills which include lack of conducive environment, lack of adequate resources, lack of motivation from students' organizations among others in Jigawa state college of education, Gumel.

RECOMMENDATIONS

This research investigation revealed outstanding findings and based on that, the following recommendations are therefore made:

- i. Government should provide accessible and affordable loan facilities to graduates of the programme;
- ii. There should be conscious efforts by educators to properly transmit the entrepreneurial skills to the learners with ease;
- iii. All bodies and stakeholders should ensure that there is proper implementation of entrepreneurship education in order to achieve its goals;

- iv. There should be proper mentoring relationship between successful entrepreneurs and would-be entrepreneurs so as to get necessary assistance from the mentor;
- v. The learners should be given the needed support and encouragement to produce goods and services in order to reduce dependency ration; and
- vi. Teachers should maintain cordial relationship with the students so as to create an avenue for better understanding of the concept.

Implications of the Findings

The researchers identify the following implications based on the research findings as:

1. The findings of this study Vocational education students' perception of entrepreneurship education skills as prognosticators of business start-up at Jigawa state colleges of education Gumel would be beneficial to college students when taught manipulating skills in entrepreneurship education in their various colleges. The knowledge gained would be used by the students to become self-reliant, contribute their quota to the society and at large to the economy of their nation.
2. It will assist the nation to reduce the rate of unemployment and reduce social vices such as cultism, drudgery and the likes that bring about disturbances in the society.
3. The society would also benefit from the findings of this study because when the students graduate with expected practical skills in entrepreneurship education, they would offer or provide good service in the area of entrepreneurship. It would also allow them to be engaged in any aspect of entrepreneurship rather than been idle.
4. The study would also be useful in educational policy making / curriculum planning and development. The research would arouse instructional educational funding agencies such as ministry of education (federal and state ministry of education) to formulate educational policies which may be useful in the implementation of entrepreneurship education programme in Nigerian colleges of education.
5. Findings of this study would be beneficial to the ministry of education and researchers. The results of the study would be used to guide the ministry in organizing seminars and training as well as workshop for entrepreneurship education lecturers in other to update their knowledge and practical skills in entrepreneurship education.
6. The findings of this study would provide suitable information that would aid the objectives planning and successful coverage of entrepreneurship education curriculum which would also be beneficial to curriculum planners and institutions. The institution would be able to incorporate the use of practical aspects. This will improve the acquisition of knowledge and skills by the students and inculcate in them the spirit of business venture.

Suggestions for Further Research

For the purpose of improvement and extension of the study, the researcher suggests that future researchers should carry out studies in the following areas:

- i. Assessment of the availability and utilization of equipments and their relevance to the study of entrepreneurship education in Nigerian colleges of education.
- ii. Impact of student's attitude towards the effective teaching and learning of entrepreneurship education.
- iii. Impact of the inclusion of entrepreneurship education programme in the Nigeria colleges of education curriculum and Nigeria economy.
- iv. Further research could examine the relationship between entrepreneurship education, student learning orientation, and the expression of entrepreneurial implementation intentions based on the different academic year.

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UTILIZATION OF GOVERNMENT ECONOMIC EMPOWERMENT BY RURAL WOMEN ENTREPRENEURS IN JIGAWA STATE

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Abstract

This paper determines the extent of government economic empowerment utilization by rural women entrepreneurs in Jigawa State. Descriptive statistics was employed on 405 rural women entrepreneurs in three different locations. Result reveals that all the rural women entrepreneurs received their funds individually and directly through table payment at once. It also reveals that majority (59%) of the rural women have fully utilized the additional funds they received to purchase additional materials needed for their business improvement. The study further reveals that approximately 65% of the entrepreneurs' purchases materials needed for their business operations more than once in a month. While close to 43% of the respondents' reveals that they have been maintaining the trend of their materials purchases for at least 4 years. Only a small chunk of the women, about 6% have invested part of the additional intervention fund they received for the purpose of diversifying their enterprises. While close to 98% of the rural women entrepreneurs studied held that the total package they have received was not sufficient for their enterprise operation after fully utilizing it. Therefore, the paper recommends that for the entrepreneurs to achieve better performance, they should learn how to judiciously utilize and manage the little resources within their control.

Keywords: Utilization, Economic Empowerment, Rural Women, Entrepreneur, Jigawa State, Nigeria.

INTRODUCTION

There have been some economic empowerment interventions instituted by federal government and donor agencies targeting women in Nigeria including Jigawa State, yet the State government in 2008 established Ministry of Economic Empowerment (MOEE) to economically empower the vulnerable groups i.e. women, youth and the physically challenged within the State. The ministry had six skills acquisitions centres, spread across the three senatorial zones of the State. The centres are equipped with the necessary infrastructure for the training of unemployed youths, women and the physically challenged in various trades such as carpentry, welding, metal works, plumbing, electrical. Others includes tailoring, fashion and designing, horse decoration, tie and dye, knitting as well as leather works in shoes and bags among others. During the training sessions, each centre mobilizes and trains a specific number of beneficiaries not exceeding 1000, in trades of their choices. The training is simultaneously run in all the centres across the State, the duration for training is a minimum of 3 months and a maximum of 6 months, depending on the trade. No certificate is issued to the beneficiaries on completion. Equipment / tools, machines and other related materials needed for each trade including the start-up

capital of ten thousand naira (N10,000) are given to the beneficiaries, only after satisfactory completion of the 1 - 3 months mandatory master craftsman training attachment. This way, the beneficiaries are expected to have mustered both practical and theoretical skills required for their trade.

Most of the businesses in rural communities lack access to basic financial services that could enable them make higher profits and income. Studies found that participation in microcredit programmes have resulted in women's socio-economic empowerment (Mayoux, 2001, Abedin & Moula, 2013, Norwood, 2014), and most women not enjoying the benefits of economic empowerment programme interventions fall under informal sector with most of them involving in small business to earn little income to support their families.

Majority of the women entrepreneurs in the study areas are yet to graduate from micro level to small or medium enterprise. And it is also observed that, majority of them are falling back on their traditional sources of finance, such as the *Asusu*, *Adashe*, borrowing from friends, relatives and money lenders. However, experiences and observations on the programme are showing unclear results as majority of the women entrepreneurs in the study areas are still operating at micro level. The question is what could be responsible for such a trend? Is it that the beneficiaries did not adequately utilize the economic empowerment provided for them? There is a need, to understand the economic and social changes attained by women beneficiaries in such an environment. Therefore, this study intends to determine the extent of government economic empowerment utilization by rural women entrepreneurs in Jigawa State.

LITERATURE REVIEW

It is quite evident that economic empowerment has positive impacts on women business performance, however, the answers depend among other things, social cultural backgrounds, individual background and the lending methodology of the organization. Nevertheless, by providing small grants to women micro-entrepreneurs, as some researchers find evidence, the grants have empowered the women, and credit has become a resource to generate additional income, to accumulate assets, and for consumption purposes.

A study conducted to compare factors influencing the loan accessibility between men and women revealed that because of the continual routine at work and family responsibilities women have effective money management compared to men in terms of effective planning and utilizing it successful so that can repay the loan within time scheduled (Mokhtar, Nartea & Gan, 2009). Peter (2001) reported that credit assistance proper utilization impact business performance of entrepreneurs in Kenya positively. But the study did not specify the gender and settlement status of the entrepreneurs.

Valdivia (2013) noted that a three-month intensive training delivered by specialized professionals plus customized technical assistance increased business sales of women micro entrepreneurs in Peru. The study further reports that women who received training without technical assistance were able to utilize and catch up by showing increased sales approximately two years after the training was first offered. This emphasizes the fact that skill acquisition via training on its own provides a major empowerment pivot for women.

Suberu, Aremu and Popoola (2011) in Nigeria, noted that, microfinance funding positively and significantly impact on small scale business performance via increasing overall market share, production efficiencies and competitiveness. This study did not capture government economic empowerment programme. Again, women were not considered separately, and there was no geopolitical zones distinction.

The work of Wrigley (2011) reported that, if poor women would be given an opportunity to access microfinance services, it will help to unlock their full economic potential and to develop a greater voice in the home upon being recognized as earners of income and contributors to household budgets. Wrigley (2011) further added that, access to microfinance services provides a platform where women could share their experiences and knowledge of different aspects of their lives. Women tend to be more willing than men to disclose their experiences and emotions to strangers and, in particular to other women Datta & Gailey (2012). This would help women to develop a network of helping each other in challenging patriarchal attitudes and sharing the knowledge of their rights. Moreover, women would be able to own assets like land and houses which were denied to them because of culture and traditions as to women who were able to buy land and built.

Governments and the World Bank perceive women's incorporation in the market economy will improve employment opportunities and production, accumulate assets, as well as alleviate poverty and achieve sustainable economic growth (Lairap, 2002). The study added that, micro-credit programs assume that the provision of credit for women's empowerment is a set of mutually reinforcing virtuous spirals.

Women entrepreneurs themselves have roles to play so as to compliment government's effort in rural micro-enterprise development in Nigeria. These include making good business decisions, having the right motive, making effort to acquire appropriate training, strong network ties, business experience or skills, innovation, market information and so on. Akanji (2006) reports that appropriate decision making is required for a woman entrepreneur to succeed in her business especially on effective utilization of funds or credits acquired. Akanji further reports that, the ability of rural women to participate effectively in micro entrepreneurs is of paramount importance for the development of micro business.

Fiala (2014) reported that men utilization of the training and loans helped ensure that the short-term results observed at six months lasted over nine months. More so, Fiala reports that lack of results for women was attributed to family pressures: married women were drained by family demands for cash, whereas married men employed family members, thus benefiting from close family ties. The study further reports that women who were physically separated from their families benefited from the loan plus training combination.

Haggablade, Hazell and Reardon (2007) assert that information is vital for concluding a deal and that business grow bigger as entrepreneurs go more and more direct with customers. Their study further informed that entrepreneurs improve the efficiency of their business operation using pioneer and informative advertisement as a source of information to encourage their customers. Therefore, advertisement is a tool to create new customers and promote goods and services to the potential customers.

From the studies reviewed accessible, most of the literatures did not focus on the rate of utilization by the rural women entrepreneurs' after enjoying government economic empowerment. This is the thrust of this paper.

METHODOLOGY

Sources of data

In this study, two major sources of data were used. These are; primary and secondary.

Primary sources of data

The study relied solely on primary data obtained from the field through the use of a well-structured questionnaire administered to the respondents by nine (9) trained research assistants, each deployed to the sampled local government areas. The ideas that formed the contents of the questionnaire are derived from the research objectives and discussion with the supervisors of the empowerment programme, who are adjudged to have sufficient knowledge on the modus operandi of the programme. Experts who have sufficient knowledge on economic empowerment programme and entrepreneurship were given a copy of the structured questionnaire for validation. Their comments, criticisms and suggestions were incorporated into the final copy of the questionnaire that was presented to the supervisors for final approval.

To further ensure the reliability of the instrument, a test-retest reliability method was adopted using Kiyawa LGA by way of pilot survey. Twenty (20) women entrepreneurs' beneficiaries were identified and measured at two different points in time. A period of three weeks interval was maintained between the first and second test, and the Cronbach's Alpha result was 0.68 which was an indication of high reliability.

Secondary sources of data

Secondary data were collected from the Jigawa State Ministry of Economic Empowerment, especially for the list of women entrepreneur beneficiaries, so as to identify them easily and their locations of entrepreneurial engagement. Documents for the follow-up exercise conducted, as well as other relevant data.

Sample size and sampling techniques

The study population comprised of 27,000 rural women entrepreneurs who have benefitted from the Ministry of Economic Empowerment 2008 to 2011 interventions and also enjoyed the 2012 entrepreneurship development support by the government of Jigawa State. The population size is too large to cover; hence the application of Taro Yamane formula was done to arrive at 395 women entrepreneur beneficiaries that were selected using the simple random sampling technique.

The sample population, if divided across the 27 chosen communities will approximately be 15 copies of questionnaire (i.e. $395/27 = 14.63$). Unfortunately there is no fraction of humans. For even distribution of respondents, given the fact that equal numbers of beneficiaries were selected for the intervention, each sampled community in the selected LGA was administered 15 copies of questionnaire. These provided a total of 405 (i.e. $15 \times 27 = 405$). Table 3.1 presents the sample distribution while Figure 3.2 shows the selected communities. The sample size was computed as shown by the Taro Yamane formula, thus:

$$n = \frac{N}{1 + N(e)^2} = \frac{27000}{1 + 27000(0.05)^2} = 395$$

Where; n is the sample size, N is the population, e is the level of precision (Yamane, 1967).

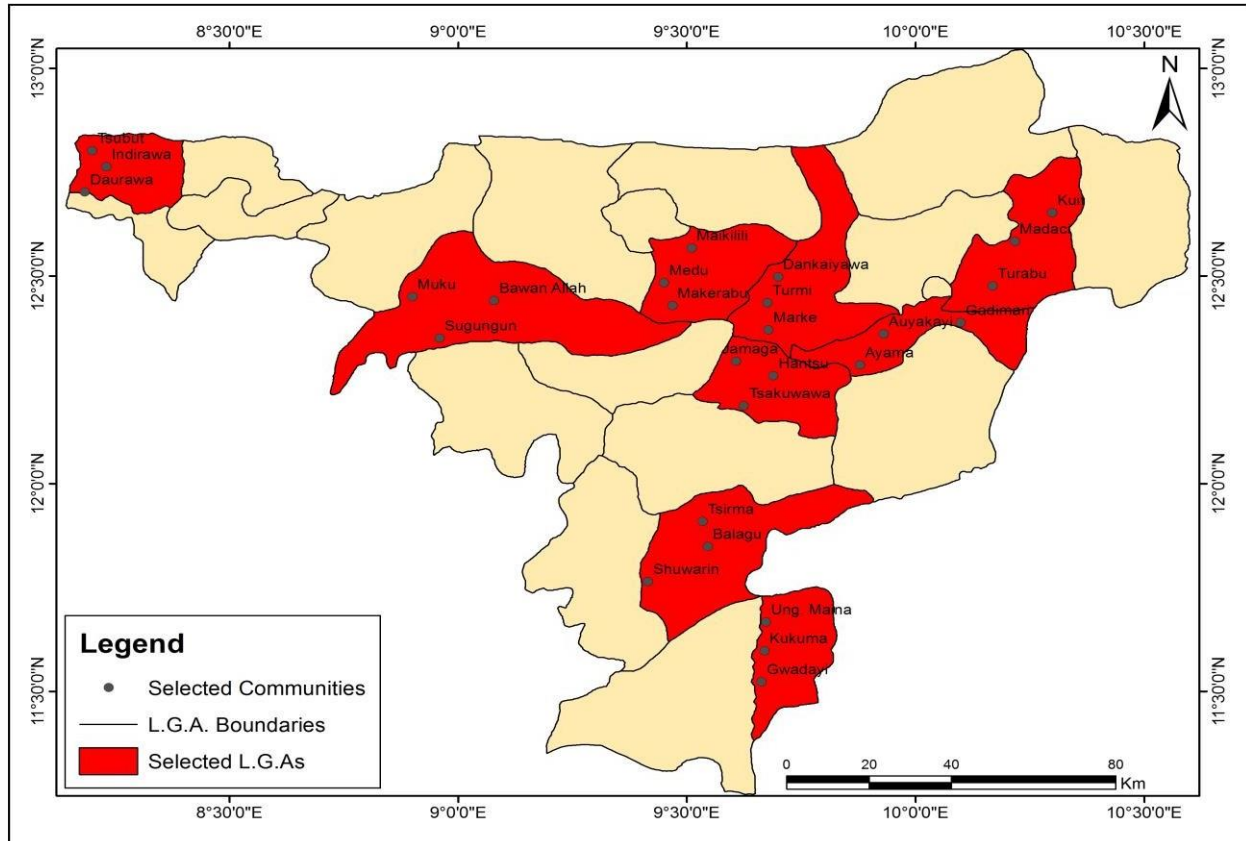


Figure 3.1: Study Area showing Selected Communities

Source: Adapted from Administrative of Nigeria

Method of data analysis

The data generated for the study was analyzed using descriptive statistics. Basically, the frequency, percentage, means and charts is employed for the analysis. At the end of data collection all completed questionnaires from the women entrepreneurs were cleaned, coded and analyzed. Data analysis was performed in order to achieve the research objective.

To analyze data for this objective, the descriptive statistics was adopted. A similar method was used by Valdivia (2013) to study “Business training plus for female entrepreneurship in Peru.

Empirical Results and Findings

Method of fund disbursement

All the respondents reported that the funds were disbursed to them directly and individually through table payment and the funds were collected by them all at once. This implied that the funds were transparently disbursed to the beneficiaries with no flaws associated to the process. This consequently allows the women entrepreneurs a favourable platform for the utilization of the funds to generate performance.

Purchase of additional materials

Table 4.1: Purchase of additional materials

Amount used	Frequency	Percent
₦3000	5	1.2
₦5000	18	4.4
₦6000	48	11.9
₦7000	95	23.5
₦10000	239	59.0
Total	405	100

Source: Field Survey, (2019).

Table 4.1 indicates that majority (59%) of the beneficiaries have fully utilized the additional funds they received to purchase additional materials needed for their business improvement as identified by the re-advancement of 2012 intervention. This by extension leads to expansion in the scope of their enterprise by way of increasing productivity and output, profitability, income generation and savings and consequently attainment of general enterprise performance.

The experience of the rural women entrepreneurs to borrowing from the traditional source such as *Adashe* or money lenders mostly to begin or expand existing businesses has played a positive role in creating an atmosphere to effectively utilize the additional intervention. This finding corroborates that of Innocent (2004) who informed that, acquiring additional business materials for SMEs have potentials for expansion, growth and improvement.

Materials purchasing rate

Table 4.2: Number of times additional materials is required in a month

Option	Frequency	Percent
Twice	263	64.9
Once	131	32.3
Total	394	97.3
Not applicable	11	2.7
Total	405	100.0

Source: Field Survey, (2019).

Table 4.2 revealed that approximately 65% of the entrepreneurs purchases materials needed for their business operations more than once in a month, where some said that they make purchases every two weeks, others weekly and many more intervals. This is an indication that their business is flourishing, leading to increase in production, sales, profit, income and growth with expansion.

Duration of maintaining materials purchase

The survival and durability of materials in use by business entrepreneurs relied heavily on the level of maintenance, most especially that of materials, tools and equipment.

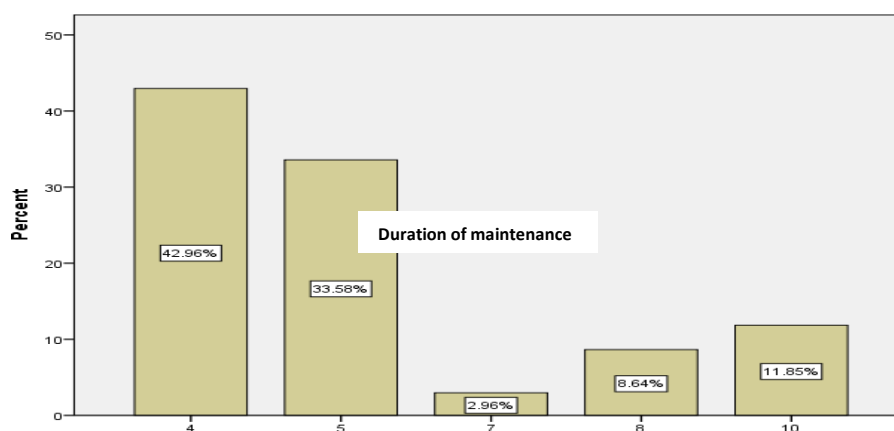


Figure 4.1: Duration of maintaining materials purchase

Source: Field Survey, (2019).

Figure 4.1 revealed that close to 43% of the respondents' reveals that they have been maintaining the trend of their materials purchases for at least 4 years. This implies that majority of the respondents have been sustaining their business operations for a long-term. The scenario contributed greatly in expanding the operational scope of some of the entrepreneurs especially those in tailoring.

Other forms of Utilization

These comprise of those who used the fund as gift to government officials, family and friends as well as using it for a different purpose.

Investment of fund to other form of businesses

Diversification is an important aspect to an entrepreneur aspiring to grow. This is because, it enables the entrepreneur to create other ventures that could support the original enterprise venture financial and otherwise.

Table 4.3: Investment in other form of business

Amount	Frequency	Percent	Valid Percent
₦5000	18	4.4	78.3
₦7000	5	1.2	21.7
Total	23	5.7	100.0
Not applicable	382	94.3	
Total	405	100.0	

Source: Field Survey, (2019).

Table 4.3 revealed that among the sampled rural women entrepreneurs, only about 6% have invested part of the additional intervention fund they received for the purpose of boosting or diversifying their enterprises. This diversification includes commercial buying (speculative purchase) of grains, firewood among many others which is promising and also profitable to them. Despite this diversification of funds, the women entrepreneurs stated in their responses that it does not affect their original enterprise, and at times they use part of the profits earned from the other venture to improve on the productivity level of their original enterprise. This is an element of livelihood integration approach.

Gifts to family and friends

Table 4.4: Gifts to family and friends

Amount	Frequency	Percent
₦1500	48	11.9
₦2000	30	7.4
₦3000	47	11.6
₦4000	18	4.4
Total	143	35.3
Not applicable	262	64.7
Total	405	100.0

Source: Field Survey, (2019).

Table 4.4 revealed that, for those that gave part as gifts, 143 respondents gave out some share of the money they received by way of gift to friends, families and neighbors. This is relatively higher because family and friends are so dear to the core Hausa/Fulani and Muslim individuals. Their responses revealed that most of those who gave gifts to the government officials also gave some to their families and friends. The gifts of some token from the funds by some percentage of the entrepreneurs did not significantly affect their enterprise operations as provided in their responses. This disagrees with Kaur, Annadurai and Sharma (2003) who reported that women entrepreneurs who are discouraged in giving part of their financial assistance as gifts would induce higher performance in entrepreneurial activities.

Gifts to government officials

Table 4.5: Gifts to government officials

Amount	Frequency	Percent
₦1500	48	61.5
₦2000	30	38.5
Total	78	100.0
Not applicable	327	
Total	405	

Source: Field Survey, (2019).

Table 4.5 revealed that, from the total number of respondents of this study, only 78 respondents gave some part of the additional funds they have received as gifts to the government officials who linked them to the government empowerment programme. Some of the women gave the gifts in kind and in most cases without the prior knowledge of the gifts by the officials.

Sufficiency of total package received for enterprise operation

Sufficiency in the provision of empowerment packages is an important tool that could ensure rapid and faster growth of an entrepreneurial venture, especially where the packages are fully utilized.

Table 4.6: Sufficiency of total package received for enterprise operation

Response	Frequency	Percent
No	396	97.8
Yes	9	2.2
Total	405	100.0

Source: Field Survey, 2019.

Table 4.6 revealed that as high as close to 98% of the rural women entrepreneurs studied held that the total package they have received was not sufficient for their enterprise operation. For them to function at higher levels as indicated by their responses, more packages need to be provided to them. This means that, despite the utilization of the total package they received, it was not enough for them to record the much expected level of performance, which is a major problem to the success of the economic empowerment programme. This is to say, majority of the rural women entrepreneurs in Jigawa State are willing to utilize the economic empowerment received to grow their enterprises to a greater height if the package for their operations were to be made higher than it was, at least by 300%. The study agrees with Peter (2001) who reported that credit assistance with proper utilization impacted business performance of entrepreneurs positively.

CONCLUSION AND RECOMMENDATIONS

The study concluded that majority of the rural women entrepreneurs in Jigawa State have fully utilized the government economic empowerment they received for their business improvement, close to 43% of the respondents' reveals that they have been purchasing needed additional materials for at least 4 years, only about 6% have invested part of the additional intervention fund they received for the purpose of boosting or diversifying their enterprises. In general there was significant impact of economic empowerment by the rural women after their fully utilization of the government economic empowerment they have received compared to what they were before the intervention. For the entrepreneurs to achieve better performance, they should learn how to judiciously manage the little resources at their disposal.

The most severe problem faced by the rural women entrepreneurs for proper utilization was the inadequacy of the total package received especially the cash advanced to them. It is recommended that for the entrepreneurs to achieve better performance, they should learn how to judiciously utilize and manage the little resources within their control.

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IMPACT OF GLOBALIZATION ON THE ECONOMIC GROWTH OF NIGERIA

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Abstract

This study empirically examined impact of globalization on the economic growth of Nigeria from 1981 - 2018. The study used secondary data sourced from CBN statistical Bulletin and National Bureau of Statistics and employed Augmented Dickey-Fuller unit root tests and Ordinary Least Square (OLS) for its analysis. The results show that export has a positive and significant impact on economic growth while openness has a negative and significant impact on the economic growth of Nigeria. The study also shows that the variables were co integrated and uni-directional causality was found from export to GDP. The study recommended that government should put policy that will boost export of goods and services in place most especially that of agricultural produce while reducing importation of goods and services.

Keywords: Export, Openness, Economic Growth, Globalization and OLS,

INTRODUCTION

In a contemporary business and public environment, globalization is an important phenomenon that has resulted in significant changes to individual countries in terms of economic growth and development. Globalization is an integration of local and international economies into a globally fused political, economic, cultural order and is not a singular phenomenon. It embraces free movement of trade, investment, labour and capital. The process of globalization spurred economic growth globally (Tvaronavičienė, & lankauskienė, 2012). Institutions and organisations such as World Bank, IMF, OECD and European Union support globalization, arguing that prosperity has rarely, if ever been sustained without trade openness. Nevertheless, this view must be followed with caution because globalization targets the promotion of economic growth but despite its contribution to the growth of developing countries such as Nigeria, it has led to international inequality whereby the rich trading countries get richer at the expense of the poor countries. In addition, there is lack of tangible benefits to most developing countries from opening their economies, despite the well-publicized claims of export and income gains, according to Aja (1996) as cited in Anowor, Ukwueni and Ikeme (2013), which antagonists argue that it is even lesser than economic losses and social disorder rapid trade openness has caused many developing countries; they also argue that trade openness has led to growing inequalities of wealth, technology, decreasing opportunities both in home and the international community, and the perception that environmental, social and cultural problems have been worsened by the workings of free trade economy. Additionally, Nigeria despite the successive report of rapid growth brought about by trade openness, economic growth has not been fully and effectively achieved due to over dependence on import and less of export. To this end, what kind of benchmark should be adopted for promoting exportation of goods and services in Nigeria? To what extent should Nigerian be involved in trade openness?

The purpose of this study is to investigate the impact of globalization on the economic growth of Nigeria. The paper is organised as follows: Section two presents the literature review, section three gives the methodology, section four data presentation and analysis and five is conclusion and recommendation.

LITERATURE REVIEW

Providing irrefutable experimental evidence on the spontaneously positive causal impact of globalization on economic growth has been a taxing undertaking, complex by a diversity of factors. Hence, some researchers are doubtful about openness having positive relationship with economic growth, few do not be in agreement at all

that openness impact on growth positively, and yet a few agree that openness leads to increase in economic growth.

Ugwuegbé and Uruakpa (2013), examined impact of export trading on economic growth in Nigeria. The study uses annual time series data from 1986 - 2011, obtained from the Central Bank of Nigeria (CBN) statistical bulletin by employed OLS to determine the impact of oil and non-oil export on economic growth while granger causality test was employed to determine the direction of causality between the variables under consideration. Correlation analysis was also deployed to determine the degree of relationship between the variables and the result showed that all the variables are highly correlated. The study reveals that oil export; Non-oil export and foreign reserve have positive and significant impact on economic growth. The result of the granger causality test shows that GDP granger causes OEXP and FRESV, and OEXP granger causes NOEXP, while NOEXP also granger causes FRESV. The study finds that, growth-led-export hypothesis is valid in Nigeria context.

In a related study, Varaidzo (2018) investigated the relationship between trade openness and economic growth in the BRICS countries by utilizing the Autoregressive Distributed Lag (ARDL) bounds test to cointegration and the Granger causality tests for the period from 1990 to 2017. The presence of a long run relationship between trade openness and economic growth is confirmed in this study. Evidence from the bounds test of cointegration indicate that there exists a bi-directional causality from trade openness to economic growth in the BRICS countries and unidirectional causality between trade openness and output growth, particularly in the case of China.

In another study, Muhammad and Benedict (2018), empirically examined the impact of trade openness on economic growth in Nigeria for the period 1981 - 2017. Using degree of openness as independent variable, the ordinary least squares technique was used on series data to examine the impact of trade openness on Gross Domestic Product (GDP). The series data were extracted from World Bank data 2017. The result of the Analysis shows that all the variables Real Gross Domestic Product (RGDP) Degree of Openness (DOP), foreign exchange (FX) and Per Capita Income (PCI) were positive and statistically significant at first difference, the study found that the variables are cointegrated and unidirectional causality was found from RGDP to DOP.

In addition, Nduka, (2013), examined whether openness leads to economic growth in Nigeria. The ordinary Least Squares (OLS) technique and data from 1970 – 2008 from CBN statistical bulletin, 2008 were employed. GDP (Economic Growth) is the dependent variable, whereas degree of openness, investment, government expenditure and lagged GDP are the independent variables. The independent variables have direct impact on the economic growth. The unit root tests show that all the variables, but lagged GDP are stationary only after first difference, and the cointegration test shows that there exists long run equilibrium between economic growth, trade openness, investment, and government expenditure in Nigeria. The study reveals that openness impact significantly on economic growth in Nigeria.

Adeleke, Akinola and Chris, (2013) investigated the nexus between globalization and economic development of Nigeria. The study employed both cointegration and causality test. The result shows that foreign direct investment is a component of globalisation and important factor influencing the economic development of Nigeria. Trade openness shows a negative relationship. The causality test indicates that a unidirectional causality exist between economic development and globalisation that is causality flows from economic development to globalisation. Again the study reveals that trade partners of Nigeria appears to be gaining more than Nigeria especially the developed trade partners.

In another study, Egberi and Samuel (2017) assessed empirically, the relationship between major globalization indicators and economic growth in Nigeria from 1980 to 2015. The co integration and Error correction mechanism were adopted. The result showed that current FDI and one period lagged FDI, one period lagged exchange rate, current Balance of Payment and two period lagged openness of the economy to the outside world have a positive and significant impact on the level of economic growth in Nigeria. The ECM shows a satisfactory speed of adjustment. The Johansson co integration test indicates a long run equilibrium relationship among the variables.

Agbo, Okoye, Agu and Oluchukwu (2018), evaluated the impact of international trade on the Nigeria economic growth. Multiple regression analysis technique was employed in estimating the various components of foreign trade. The data used for the study was extracted from the 2012 edition of the CBN statistical bulletin, covering the period from 1980 – 2012. The results of the study showed that Export trade has significant impact on the Nigerian economic growth, import has insignificant impact on the Nigerian economic growth.

In a related study, Konyeaso (2016) examined the impact of globalization on Nigerian economy, Data spanning from 1986 to 2013 were used for the study. Using multiple regression analysis, it was established that there is a positive relationship between globalization and economic growth. The conclusion was that Nigerian economy is gaining from globalization mainly due to Foreign Direct Investment (FDI) and trade openness.

Adeleye, Adeteye, and Adewuyi (2015) examines the impact of international trade on economic growth in Nigeria, using net export (i.e total export less total import) and Balance of Payment as proxies for international trade while Gross Domestic Product represent economic growth. The study employed regression analysis as the method of analysis using co-integration and error correction Modelling techniques to find the long-run relationship between economic performance and international trade. Only Total Export (TEX) remains positive and significant while others remain insignificant, which means, Nigeria is running a monocultural economy where only oil act as the sole support of the economy without tangible support from other sectors such as industrial/manufacturing and agriculture

Agbarha and Peter (2017) on the other hand assessed empirically, the relationship between major globalization indicators and economic growth in Nigeria. The paper covered the period between 1980 and 2015. The cointegration and Error correction mechanism were adopted. The result showed that current FDI and one period lagged FDI, one period lagged exchange rate, current Balance of Payment and two period lagged openness of the economy to the outside world have a positive and significant impact on the level of economic growth in Nigeria. The ECM shows a satisfactory speed of adjustment. The Johansson cointegration test indicates a long run equilibrium relationship among the variables.

Yaya (2017), examines the impact of trade openness on economic growth for Cote d'Ivoire over the period 1965–2014 in a multivariate framework including capital stock, labour and trade openness as repressors. It uses the Autoregressive Distributed Lag bounds test to co integration and the Toda and Yamamoto Granger causality tests. The results show that trade openness has positive effects on economic growth both in the short and long run.

METHODOLOGY

This section detailed the model adapted for the study, the research design entailing variables definition and measurement parameters, sources of data, and model specifications. The data for this study was sourced from CBN statistical bulletin and National Bureau of Statistics and analysed using OLS.

Model specification: To establish the relationship between economic growth proxy by Gross Domestic Product (GDP) and globalization; this study adapted the model by John and Aruwa (2014), the model for this study is as follows:

$$GDP_t = \beta_0 + \beta_1 EXP_t + \beta_2 OPN_t + \varepsilon_1 \quad \dots\dots\dots 1$$

$$\ln GDP_t = \ln \beta_0 + \beta_1 \ln EXP_t + \beta_2 \ln OPN_t + \ln \varepsilon_2 \quad \dots\dots\dots 2$$

Where $\ln GDP$ is natural logarithm of gross domestic product, $\ln EXP$ is natural logarithm of Export, $\ln OPN$ is natural logarithm of Openness and ε_i is stochastic variable or error term (random walks).

A

priori expectation

It is expected that $\beta_0 \beta_1 \beta_2 > 0$, It is expected that export (EXP), OPENESS (OPN) will have a positive relationship with Gross domestic product (GDP).

DATA PRESENTATION AND ANALYSIS

Table 1: Summary of ADF Unit Root Test Results

Variables	ADF at level 1(0)	Critical Value (5%)	ADF at First diff. 1(1)	Critical Value (5%)	Remarks	Prob. ADF 1(0)	Prob. ADF (1)
LOG GDP	-3.6310	-0.2532	-3.6268	-4.9219	1(1)	0.9223	0.0003*
LOG EXPORT	-3.6210	-0.9977	-3.6367	-5.6240	1(1)	0.7440	0.0001*
LOG OPENESS	-3.6329	-3.4394	-3.6463	-4.5229	1(1)	0.0161	0.0010*

Source: Author's Computation Using Eviews 9.

* represent 1% level of significant

The results of Augmented Dickey-Fuller (ADF) revealed that all the variables of the model were stationary at 1 per cent as indicated by their probability values of 0.0003, 0.0010, and 0.0010. The result further indicated that all the variables are stationary at first difference 1(1).

Table 2: Ordinary Least Square

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	18.01180	15.77346	1.141905	0.2617
LOG GDP(-1)	0.720460	0.049070	14.68231	0.0000
LOG EXPORT	1.648311	0.231397	7.123305	0.0000
LOG OPENESS	-46.52637	21.24247	-2.190252	0.0357
R-squared	0.975807	F-statistic		443.6842
Adjusted R-squared	0.973608	Prob(F-statistic)		0.000000
Durbin-Watson stat	2.173796			

Table 2 contains multiple regression results for economic growth proxy by GDP, export and openness in Nigeria. The results indicate the coefficients of Gross domestic product (GDP) at lag 1, export (EXP) and Openness (OPN) are found to be statistically significant at one percent and 5 percent as indicated by their probability value of 0.0000, 0.0000 and 0.0357 respectively. The coefficient of constant was found to be statistically insignificant with probability value of 0.2617.

The coefficient of export (EXP) is rightly signed (positive) and consistence with theoretical expectation of this study while that of the openness has an inverse relationship contrally to the apriori expectation of the study. The regression results implies that 1 unit increase in export (EXP) will raises economic growth (proxy by GDP) by 0.16483 per cent while one unit increase in openness will reduce GDP by 46.5264. The F-statistics value of 443.68 which measure the joint effects of the explanatory variables was found to be significant at 1 per cent as indicated by the corresponding probability value 0.0000. This implies that the variables of the model are jointly and statistically significant affected economic growth (GDP) in Nigeria.

The R^2 value of 0.9758 implies that 97.58 per cent of the total variation in economic growth (GDP) in Nigeria was explained by export (EXP) and openness (OPN). Coincidentally, the goodness of fit of the regression remained high after adjusting for the degree of freedom as indicated by the adjusted R^2 ($R^2 = 0.9736$ or 97.36%). The R-Square suggested that not only the included variables of the model that affect economic growth in Nigeria, but there are other variables, although their influence is highly insignificant than those variables captured in the model. The Durbin-Watson statistics (2.1738) is higher than R^2 (0.9758) indicating that the model is non-spurious.

Table 3: Pairwise Granger Causality Tests

Null Hypothesis:	Obs	F-Statistic	Prob.
EXPORT does not Granger Cause GDP	36	8.19333	0.0014
GDP does not Granger Cause EXPORT		0.39465	0.6773
OPENESS does not Granger Cause GDP	36	0.21547	0.8074
GDP does not Granger Cause OPENESS		2.10245	0.1392
OPENESS does not Granger Cause EXPORT	36	0.21543	0.8074
EXPORT does not Granger Cause OPENESS		1.52124	0.2343

The Pairwise Granger Causality Tests revealed that there is only one way causation existing between export and economic growth proxy by GDP, though the causation runs from export to Gross Domestic Product (GDP) that is export causing GDP.

Table 4: Johansen cointegration test

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.509198	37.61933	29.79707	0.0051
At most 1	0.250653	11.99762	15.49471	0.1570
At most 2	0.043729	1.609687	3.841466	0.2045

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.509198	25.62171	21.13162	0.0109
At most 1	0.250653	10.38793	14.26460	0.1877
At most 2	0.043729	1.609687	3.841466	0.2045

Johansen co integration test for both trace and max-Eigen indicates one co integrating equation at 0.05 level of significant thus denotes the rejection of the hypothesis at 0.05 levels and provides evidence of long run relationship among the variables.

TABLE 5: Variance Inflation Factors

Included observations: 37

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	248.8020	11.29730	NA
LOG GDP(-1)	0.002408	5.367484	3.150294
LOG EXPORT	0.053545	5.395881	2.425414
LOG OPENESS	451.2425	8.536636	1.482447

The Variance Inflation Factors (VIF) results revealed that there is no multicollinearity as indicated by the Variance Inflation Factors (VIF) results of less than 10 for the entire variable.

TABLE 6: ECM

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	132.4025	28.34178	4.671637	0.0001
DLOG(GDP(-1))	4.435708	1.289135	3.440840	0.0018
DLOG(EXP(-1))	-10.31229	3.442837	-2.995287	0.0056
DLOG(EXP(-2))	-5.514344	3.190339	-1.728451	0.0945
DLOG(OPN(-1))	156.7119	144.4501	1.084886	0.2869
ECM(-1)	-1.002205	0.454817	-2.203535	0.0357
R-squared	0.314196	F-statistic		2.657228
Adjusted R-squared	0.195954	Prob(F-statistic)		0.042736
		Durbin-Wats stat		0.389472

The results of error correction representation for the selected OLS model were contained in Table 6. The coefficient of the ECM shows the speed of adjustment to the deviation in the short run equilibrium. The negative value of the coefficient of ECM implies that there is a long run relationship between Economic growth proxy by gross domestic product (GDP), export and openness in Nigeria. The coefficient of ECM which is (-1.002205) showed that the model will adjust by -1.002205 per cent to go back to equilibrium in the long run. Precisely, -

1.002205 implied that when there is a state of disequilibrium between Economic growth proxy by gross domestic product (GDP), export and openness it will be brought back to equilibrium in at most one year.

CONCLUSION AND RECOMMENDATION

This study empirically examined the impact of globalization on the economic growth of Nigeria from 1981 to 2018. The dependent and explanatory variables used for the study are Economic growth proxy by Gross Domestic Product (GDP), export and openness. The study employed Unit Root test, Ordinary Least Square (OLS) for its analysis. Data analysis revealed that relationship exists between GDP, export and openness. Export has positive and significant impact on the economic growth of Nigeria while openness has negative and significant impact on the economic growth of Nigeria. This shows that an increase in export will lead to increase in GDP while increase in openness will lead to decrease in GDP. The study further concludes that export and openness have significant impact on economic growth in Nigeria. Based on the findings, it is recommended that government should put policy that will boost export of goods and services in place most especially that of agricultural produce while reducing importation of goods and services.

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BUBBLES, SUNSPOTS IN THE NIGERIAN STOCK MARKET: AN EMPIRICAL SURVEY

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Abstract:

Deviation of asset prices from their fundamental equilibrium or long-run value is a feature of market asymmetry/ frictions. It is also widely believed that the financial bubbles can depress the real economy through their negative transmission effect, particularly if there are extraneous forces at work. It is against this premise that this study sought to empirically investigate the existence of speculative bubbles and sunspots in the Nigerian Capital Market characterizing the period 2007Q4 to 2008Q4. This period is particularly important given that it marked an era of financial upheavals, particularly stock market turmoil in the global financial market, with varying proportions and magnitudes. Employing unit root test and co-integration techniques to determine the existence of deviation in asset prices during the period, various GARCH models and a peak-period analysis, the empirical results show evidence of speculative bubble and sunspots in the Nigerian Capital Market. Against this backdrop of these findings, we recommend that strong regulatory and coherent institutional structures that enhance the operational efficiency of the stock market be put in place. Importantly, the development of early warning signals (EWS) is important.

Keywords: Asymmetry, Bubbles, Sunspots, Efficiency, Capital Market

INTRODUCTION

The capital market and the level of its efficiency are exceptionally central in the economic growth (EG) and development procedure of any nation. It serves as the financial hub for the mobilization, allocation, and re-allocation of resources and assets pricing among firms and other market participants and operators. An efficient capital market is assumed to respond promptly to any relevant information regarding economic and financial fundamentals about the assets or firms filtering into the market that empowers market participants to coordinate their decisions. Contrary to the efficient market hypothesis (EMH) preposition by Fama (1970) that investment decisions are just influenced by economic and financial fundamentals. Today, it has been observed and demonstrated by several empirical studies such as Shiller 1998) and Bailey (2005) in the literature that sunspots also have a significant impact on investors' decisions in the financial market. Sunspots by their nature refer to those extrinsic random variables that don't influence economic fundamentals directly, yet may affect equilibrium, resource allocation to a vast degree. Osamwonyi (2013) posits that sunspots are uncertainties upon which participants coordinate their decisions, and are not transmitted through fundamentals but via expectations to affect equilibrium.

Bubbles on the other hand are sudden rises in the prices of shares or assets not being backed or supported by basic verifiable known economic and financial fundamentals. Asekome and Agbonkhese (2015) contend that a non-essential factor such as calendar effect, style investment, noise trading, inside information, stock market control, and changes in the political condition is ordinarily responsible for some of the observed behavioral anomalies in financial markets today. Indeed, even overconfidence or hubris hypothesis disposition of some investors has also been recognized as a possible cause of asset value bubbles, which in some cases prompt speculative bubbles and crash as witnessed in the 1987 U.S. stock market crash. Shiller (1987) also observed

that despite negative signs before the crash, some investors proceeded to overplay on their confidence. By implication, investors' were over positive about the financial market and tend to ignore earlier information living in a gambler's fallacy (Asekome & Agbonkhese, 2015). Owing to sharp increases in the prices that characterised securities traded in Nigerian stock exchange between 2007 to 2008, this study became pertinent to establish if speculative bubbles and sunspots were responsible for the deviations and spikes in prices of quoted securities. Hence, the objective of this paper is to empirically determine the existence of speculative bubbles and sunspots in Nigerian capital market. The rest of the paper is thus sub-divided into: section 2, which presents the review of prior literature and followed by section 3, which presents the methodology and model specification, thereafter section 4 discusses empirical results and lastly section 5 presents the concluding remarks and recommendation.

LITERATURE REVIEW

Concept of Sunspot

Sunspots are an array of Extrinsic Random Variables (ERV) whereupon stakeholders organize their decisions. ERV doesn't directly affect economic fundamentals but influences expectations and may impact equilibrium outcomes. Resources allocation is a function of a significant degree of sunspots in real equilibrium (Garber, 2001). General-equilibrium and rational expectation model that explains excess dynamics in a system is the term sunspots model. Intrinsic instability (economic fundamentals susceptibility) is not a sole channel of economic volatility outcomes. Extrinsic dynamics may also saliently drive market vulnerability which corresponds; animal spirit, market psychology, and self-satisfying prophecies (Brooks & Katasaris, 2005).

Cass and Shell (1983) championed the sunspots equilibrium idea, named "sunspot" being a take-off from Jevons nineteenth-century work; an economist who associated business cycle to real sunspots circle. Cass and Shell point out that bank runs and similar financial system challenges (weaknesses) are best ascertained by sunspot – equilibrium outcome. The 2007-2010 financial meltdowns can be seen as somewhat sunspot-driven.

Causes of Sunspots

Noise Trading

A noise dealer is a term used to describe an investor who makes decisions regarding buying and selling financial assets without the use of crucial information. These investors for the most part have poor planning, take after trends and over-react to great and terrible news (Investopedia, 2016). In real-life situations, numerous investors are considered to be noise traders as not very many settle on investment decisions by basically using essential analysis. Notwithstanding, technical analysis is regarded as a feature of noise trading because the information is unrelated to the fundamentals of an organization.

Herd Behavior/Bandwagon Effect

This is the propensity for individuals to imitate bigger group actions. Some of the reasons behind it are the social pressure of conformity (Economics, 2013). Experience has shown that it can be an intense coerce. This is because most individuals are extremely sociable and want to be acknowledged rather than be tagged by the group as an outcast; they just take after the group regarding it as a fantastic way for converting into a part. Once more, it could also be the normal rationale that this huge group might be wrong. From all indications, establishing the possibility that one was persuaded that a particular course or activity or thought is wrong or irrational, they may mimic the crowd believing that they know something better and different than you.

Calendar Effect (CE)

The CE theory explains that stock prices at different times perform differently in a year. That is, it is an economic influence or market anomaly that is associated with the calendar (Wikipedia, 2016). Such impact includes the various stock markets conduct on different weekdays, times of the month, and year (seasonal tendencies). Multi-year impact like 10-year circles or the U.S 4 year presidential election decision cycle is sometimes included.

Insider Information (II)

Insider Information (II) in financial markets as indicated by Investopedia (2015) is considered as a private reality concerning the state or plans of a publicly traded organization that will encourage a financial advantage when applied in sales or purchase of shares of a firm. Regularly, II is picked up by organization staff or its close ally. A market participant who used and gained from II trade is guilty of insider trading. This is illegal because the information is not readily available to the public and has been exchanged. Those having this knowledge of II (insider information) possess an undue edge over others.

Concept of Bubble

An economic bubble also called market, financial, value, speculative, inflatable, or mania bubble; is an asset exchange at an outrageous value higher than the intrinsic asset value. Put differently, a bubble is when the asset price is based on inconsistent views about the future. Asset bubbles began in the 1600s and are perpetually inherent in the future of modern-day economic history. The mid-1630s Dutch Golden's Tulipmania is historically considered as the first recorded bubble. Osaze (2011) posits that a stock market bubble is created when the prevailing market prices of stocks exceed the intrinsic value of the future income interest and returns (dividends) from the stocks i.e buying basically to resell at a for a higher price which is driven by speculation than for potentially generated income is clear proof of bubble's present in the market. This is so because intrinsic values are always difficult to notice in pragmatic markets, hence bubbles are always differentiated just in retrospect when sudden price nosedive surface. Such a drastic price drop is the term "bubble burst or crash" The bubble burst and boom phase is instances of positive (direct) criticism mechanism that amplify the cost of equilibrium in typical market conditions. Under an economic bubble, prices unpredictably vary, and request and supply alone cannot predict wind up plainly (Osaze, 2011).

While some economist disagrees with bubbles occurrence, its causal factors remain disputed who agreed to the existence of bubbles. Different explanations have been submitted and studies have pointed out that though bubbles may occur without speculation, small rationality, and instability in which case they can be term sunspot equilibria or non-speculative bubble. In this circumstance, the bubble might be classified to be rational, where complete compensation for bubble possibility may collapse by higher returns is constantly given to investors at each point. These methods demand that bubble collapse planning must be forecast probabilistically, and the Markov switching model is regularly used to model the bubble process. Similar submission opines that the value coordination process may at least cause bubbles.

Cause of Bubbles

Financial system monetary excessive liquidity is an important cause of bubbles, instigating banks to engage in improper loaning standards, which render markets helpless against unpredictable asset value swelling triggered by short-term, debt speculation. For instance, Deutsche Bundes bank erstwhile president Axel A. Weber argued that excessive liquidity provision in the global financial market due to a low rate of interest in the past spur asset-value-bubble arrangement. In specific details, this explanation may vary concerning economic philosophy. Osamwonyi (2013) concludes that the causes of a bubble can be demonstrated in trinity- rational, through intrinsic to the contagious. Social psychological factors are also determinants; this can be demonstrated by the greater fool theory where perennially optimistic market participants sell stocks to greater fools until the bubble burst when there are no greater fools to sell to.

Simply put, economic bubbles regularly happen when an excessive amount of cash is chasing excessively a couple of assets, causing great and terrible assets to excessively appreciate beyond their fundamentals to an unsustainable point. Once market correction occurs; the bubble bursts, price nosedive, and unsustainable investment schemes collapse (like Ponzi schemes), which result in consumer (and investor) loss of confidence. However, a regulatory authority presence like the central bank will embark on contractual regulatory measures with the end goal to mop up the surplus liquidity from the financial system or risk its currency collapse (Mala & Reddy, 2007). Such framework measures may include financial system bailout and normal form of contractionary monetary policy. Others include high-interest rates to make more investors risk-averse and dodge debt capital due to its high cost. Increase in capital reserve requirement and preventing process prompting over-expansion and excess debt utilization. In a perfect world, such counter-measures reduce the impact of a downturn by strengthening financial institutions and a viable economy (Olajide, 2009).

Nigeria Stock Market Bubbles and Breadth

Stock Market Bubble (SMB) is a kind of economic bubble that surfaces when the stock price rises toward overvalued by whatever stock valuation measure. SMB existence is contrary to Efficient Market Theory (EMT) that believes in investors' rationality conduct. Behavioural Finance Theory (BFT) assigns SMB to personal bias that results in crowd conduct and groupthink. When bubbles occur pundits try to uncover the rationale, to avoid being against the group. Sometimes, concerns about the overpriced market are dismissed by individuals by using other economic as a reference where the rules of the old stock valuation may never be used again (Bekaert & Harvey, 1997).

The SMB burst results in a market crash which is a nightmare for each investor. Stock Market Crashes (SMC) is momentous financial events that are interesting to practitioners and academics alike. For investors and traders, an interminable source of stress is the dread of the crash. Also, the occasion onset itself in most cases ruins the life of some of them (Edwards & Samuel, 2001). There is no quantitative meaning of SMC; the term is literally

used to describe double-digit stock market index losses in percentage within the time range of several days. Hence, Jayasuriya (2005) describes SMC as a sudden sensational decay in asset prices across the significant stock market cross-section.

Theoretical Consideration

In the words of “greater fool theory,” bubbles are driven by perennially optimistic participants typify as “the fools” in the market who buy overvalued assets in anticipation of re-selling the assets to other speculators (the greater fools) at a significantly higher cost. As long as fools can discover greater fool to purchase the overvalued assets, the bubbles continue. However, when a greater fool becomes the greatest fool who pays the best price for the overvalued asset and another purchaser to pay a higher value (price) cannot be discovered, the bubbles end (Nwokoma, 2002). This theory is inherent among laymen but has not yet been empirically affirmed. Group conduct is another explanation used in behavioral finance. Which opine that investor’s sales and purchase tend to go in market trend direction; sometimes assisted by technical analysis that constantly tries to differentiate that trend and tail them, this creates a self-satisfying prediction.

Empirical review of sunspots, bubble and capital market

Froot and Obstfeld (1991) developed a model to empirically test bubbles and they based their test for bubbles on intrinsic fluctuations in stock market prices. The core explanatory variable is dividends. The Standard and Poor's stock price and dividend 20th-century data was used for their test. The martingale geometric log (dividends) methodology was adopted to derive the fundamental values. Findings show that the bubble component coefficient is significant and positive. This suggests that prices exceed fundamental values due to the bubble component; thereby confirming the existence of bubbles, however subject to some underlying assumption. Wu (1997) studied the existence of a negative bubble (period of extremely undervalued asset price) in the market. He developed a model matrix base on the Kalman filtering technique. The result shows that at a certain point in time, a bubble is a significant component of equity prices during bear and bull markets. Also, findings show that before 1960s negative bubbles were very common but vanish after the 1960s.

Boubaker, Nguyen, and Taouni (2007) examined the presence of speculative rational bubbles, intrinsic and state rational bubbles exist in Tunisia from 1971 to 2005. The first stage adopted direct test, unit root, and Engle and Granger co-integration, Froot and Obstfeld (1991) methodology to analyze data. First, the findings show that the unit root test of ADF and P-P support the presence of asset bubbles while the co-integration test rejects asset bubble presence. Second, the result supported the existence of intrinsic bubbles in the Tunis bourse.

Leon (2007) looked at the nexus between expected stock market returns and volatility in the regional bourse of the West African Economic and Monetary Union called the BRVM. Weekly returns from January 4th, 1999 to July 29th, 2005 were analyzed by the EGARCH-in-Mean model and Student's t distribution for error terms methodology. Findings reveal that expected stock return has a direct significant association with expected volatility. Also, volatility is higher during market booms compared to market declines.

Olowe (2009) investigated the association between stock returns and volatility in Nigeria adopting the E-GARCH methodology to model different reforms (insurance, banking), stock market crash, and the global melt-down. The result pinpoint little evidence between stock returns and risk relationship as captured by its volatility and reveal that banking reform and stock market crash inversely impacts stock return while insurance reform and the global financial crisis have no significant impact on stock return. Njiforti and Akaolisa (2010) investigated whether the Nigerian stock market has experienced a speculative bubble using unit root test, cointegration, and GARCH on a time series data for banks and insurance companies listed in the Nigerian stock market for the period 2008 to 2009. Findings recognized speculative bubbles in many banks and insurance firms. Austin (2016) examined bubble existence by considering risk and price-earnings ratio nexus. The study adopted Malte Von Maravic (2010) model and rolling regression estimation method was employed. Findings identified four bubbles. Only the dot.com was seen with complete confidence and other bubbles were figured out with slightly less confidence. Aigbovo, Ozekhome, and Isibor (2017) examined whether there was a speculative bubble in the Nigerian bourse for the period 2008Q1 to 2009Q4. They utilize sequential analytical techniques involving unit root test and co-integration test to first, determine the existence of random walk and fundamental deviation in stock prices during the period. Subsequently, GARCH models were employed to determine the degree of volatility, persistence, clustering, and leverage effects arising from such volatility. The empirical results reveal that a speculative bubble existed in the period, with evidence of volatility persistence, asymmetric effects, and mean-reverting variance. Again, Aigbovo and Ezuem (2018) ascertained sunspots, bubbles in the Nigerian capital market. They employed data spanning the period of 2008Q1 to 2009Q4 sourced from Nigeria stock exchange using Engle and Granger, Augmented Dickey-Fuller (ADF), and Philips-Perron stationarity tests. The findings revealed that the absence of rational asset bubbles in the Nigerian capital market. The study of Chijuka and Iroh (2020) used the error correction model to determine the issues of sunspots,

bubbles, and the Nigerian capital market from 1990 to 2008. The findings showed the fundamental values of stocks are driven by external sector variables like remittances and portfolio flows from abroad..

METHODOLOGY AND ANALYTICAL TECHNIQUES ARCH AND GARCH

In general, the capability to handle clustered volatility and financial data of large effect are absent in Ordinary Least Square (OLS) due to its homogeneous variance and normal Gaussian distribution assumption; this makes the technique insufficient to estimate financial data. This limitation has been handled by the ARCH-type model developed by Engle (1982) with a unique type of random processes that simplified time difference conditional variances and associating them with variables known from the prior period.

Engle (1982) first introduces the ARCH model and by Bollerslev (1986) as GARCH (Generalised ARCH), proven as a veritable tool for financial time series analysis.

ARCH which is equivalent to Autoregressive Conditional Heteroskedasticity is designed typically to handle and forecast conditional mean and variance. The term “Conditional” here describes dependence on the observations of the immediate past while “autoregressive” stress the presents of feedback mechanism, which explains future variances by infusing previous observations into the present. The ARCH effect is a function of agent aggressiveness and variance of extraneous element potentials as confirmed by the standard econometric test used. If there is a relatively small variance of the latter to that of fundamental variance or when ARCH agents are unaggressive, then asset prices always follow fundamentals; besides occasional bubble behavior is displayed by asset prices, when agents are more aggressive because an extraneous element is larger. Engle’s (1982) ARCH test and GARCH (1,1) model estimation test support the idea and conclusion that the data can be seen as ARCH/GARCH (Njiforti&Chidiogo, 2010). Particularly, Generalized ARCH takes cognizance of the information declining impact on volatility; that is, it allows the user to model the serial dependence of volatility. The conditional mean and variance specifications are required in the application of the ARCH model

$$y_t = a + X_t Y + s_t \dots\dots\dots (1)$$

$$y^2_t = y s^2_{t-1} + \beta y^2_{t-1} \dots\dots\dots (2)$$

Where;

Eq(1) : conditional mean; Eq(2): conditional variance; $X_t Y$ = exogenous variables; a = Constant; s^2_{t-1} = volatility News from the lag period, gauge as the square by s_{t-1} from the mean equation, and is the ARCH component.

y^2_{t-1} = forecast variance of last period that explains the GARCH term; $y\&\beta$ = coefficient to be estimated; s_t = error term

Announcement of macroeconomic news, option price implied volatility and realized volatility, trading volume, volatility realized after hours, overnight returns have been identified to help predict volatility (Zivot, 2008). Financial returns volatility clustering is specifically observed in daily, weekly or intraday data. In daily, we test for the ARCH effect.

Asymmetric ARCH and GARCH models

Exponential-GARCH (E-GARCH) is an asymmetric ARCH model, it allows for the asymmetry in return responsiveness to shock signs and policy change. It is specified in logarithms without imposing negative constraints on parameters.

$$\text{Where } h_t = \log y^2_t \dots\dots\dots (3)$$

E-G ARCH model has a superior advantage to the basic GARCH model because positive conditional variance is guaranteed irrespective of the coefficient in Eq(3) because the log of y^2_t instead of y^2_t itself is modelled. Conditional variance is allowed to affect the mean in the GARCH-M model. The basic GARCH model is proposed by Engle, Lilien, and Robins (1987) to an extent, so that risk premium which is an integral part of expected return is generated by conditional volatility. The expanded version of the GARCH model is called GARCH-M or GARCH in the mean model. The expected risk coefficient estimated is a risk-return trade-off measurement given as;

$$y_t = a + X_t Y + \beta y^2_t + s_t \dots\dots\dots (4)$$

y^2_t and y_t = conditional variance and mean return; $X_t Y$ = mean deviation plus exogenous variable; s_t – error term

Zakoian (1990) and Glosten, Jaganathan, and Runkle (1993) suggested the threshold GARCH (T-GARCH) model specified as;

Where W_{t-1} indicate dummy variable = 1 when $W_{t-1} = 1$ if $\mu_{t-1} < 0$

$$0 \text{ if } \mu_{t-1} \geq 0$$

This depends on whether μ_{t-1} is $>$ or $<$ 0 threshold. μ_{t-1}^2 has a separate impact on the conditional variance δ_t^2 such that μ_{t-1} is $>$ 0, the entire effects are shown by $\varphi_i \mu_{t-1}^2$ when μ_{t-1} is $<$ 0, the entire impacts are expressed as $(\varphi_i + \omega_i) \varphi_i \mu_{t-1}^2$. For the effect of bad news to be large, ω_i is expected to be $>$ 0.

Unit root test:

The property features of rational bubbles are enshrined in the price-earnings ratio to possess a unit root).It is estimated using the ADF test with univariate time series data of price-earnings ratio. Higher-order serial correlation correction is constructed by the ADF test by assuming that price-earnings ratio follows AR (p) process and incorporating “p” lagged terms of the explained variable to the right-hand side of the regression model.

Co-integration

If price reflects their fundamental values in the bourse, the co-integrating relationship is expected between them and stock prices. If stock prices, price-earnings ratio, and dividend fail to demonstrate the presence of a co-integrating relationship, then there an absence of bubble in which a serious deviation from price occurred. The co-integration test is carried out co-integration by running an OLS regression on the residuals. The Engle-Granger (EG) two-stage tests are used to investigate the co-integrating status of the variables.

Data Sources

Data for the empirical study were sourced from the daily Price Listings from Nigeria Stock Exchange (NSE) factbook, Securities and Exchange Commission (SEC) quarterly magazine, and Central Bank of Nigeria (CBN) statistical bulletin. The sampled banks under consideration are Fidelity Bank, Access Bank, First Bank, FCMB, United Bank for Africa, Eco Bank, Guaranty Trust Bank, Union Bank, WEMA Bank, and Zenith Bank. The variables considered are Share price, Price-earnings ratio, and dividend for the selected banks for the period 2007Q4- 2008Q4.

EMPIRICAL RESULTS AND ANALYSIS

In investigating whether there was a speculative bubble and sunspots in the Nigerian Capital within the period 2007Q1 to 2008Q4, several successive analyses are done. First, a preliminary stationarity test is carried out on the variables to investigate if a fundamental deviation existed. Second, the co-integration test is conducted using the Augmented Engle-Granger (AEG) test to examine whether the variable is co-integrated. This is necessary to investigate the presents of the speculative bubble in asset price on account of serious deviation from asset fundamentals. The clear absence of co-integration suggests the presence of a speculative bubble and a serious deviation from fundamentals (Njiforti & Chidigbo, 2010; Wang & Wen, 2010). Third, volatility asymmetric – estimate using ARCH and GARCH is done to investigate the presence and persistence of volatility in such asset price deviation. Finally, a peak period analysis is carried out to ascertain the sunspots' existence.

Unit Root Analysis

The unit root test involves the test of stationary to determine the existence or otherwise of random walk in asset price fundamental. Using the Augmented dickey Fuller (ADF) test to analyze the stationarity of the variables, the levels, and the first difference output are displayed in table 1.

Table 1: Stationarity Test

Variable	ADF Statistic (in Levels)	ADF Test Statistic (in First Difference)	Order of Integration	Remark
ΔSP	-1.0992	-5.775**	I(1)	Stationary
ΔDIV	-2.051	-4.870*	I(1)	“
ΔPE	-1.905	-5.894**	I(1)	“

***(**) portray 5%(1%) significance level**

The results of the unit root test indicate that in all the variables, the null hypothesis of no unit root cannot be rejected, implying that the variables are non-stationary at levels, characterizing the existence of a random walk in which serious fundamental deviations was experienced in asset prices; a pointer to asset price bubble during the period. Consequently, the result attested to the existence of asset price bubbles (Kocherlakota, 2009; Njiforti & Chidiogo, 2010).

Co-integration Test

In table 2, the ADF computed value of (-5.444) is less than the critical ADF absolute value of -5.772 at 95%. This indicates that there is no co-movement (co-integration) among the variables, attesting to the existence of asset price bubbles, arising fundamental deviation during the period

Table 2. Co-integration Test

Variable	ADF Test Statistic	95% Critical ADF Value	Remarks
Residual	-5.444	-5.772	Stationary

Given that speculative bubble existed in the market, implying fundamental deviation (volatility) in the stock market during the period, there is a need to investigate volatility persistence and clustering in the market during the period; necessitating the ARCH and GARCH estimates reported below:

ARCH AND GARCH ESTIMATES

The results of the volatility behavior of the share price, dividend, and earnings are estimated and reported below. In the share price result in Table 3, the variance model indicates that the ARCH term passes are valid as shown by the z-test at 5% level. Similarly, at 5% the GARCH term is coefficient is negative and significant. The term significance pinpoints the existence of volatility in the system. Invariably, there is a fundamental deviation in asset prices during the period in focus. This is a fluctuation of price about its fundamental value. The GARCH inverse coefficient suggests that after some time the observed volatility may be mitigated, although some degree of memory effect exists. The period is also seen to be characterized by a sluggish mean-reverting process, given that the sum of the coefficients of the ARCH and GARCH terms are less than one.

Table 3: GARCH Output for Share Price

Variable	Coefficient	Z-Statistics
C	0.21685	1.3292
Variance Equation		
C	1.9940	-1.6802
ARCH	0.41303	3.3503
GARCH(1)	-0.1270	-12.7041

$R^2 = 0.93$; Adj $R^2 = 0.91$; D-W = 1.72; F-statistics = 77.04

Table 4 reveals the result of the volatility estimation for price-earnings ratio. The mean equation in the result shows that volatility in a price-earnings ratio is severe for a considerable length of time during the period. This is further buttressed by the ARCH and GARCH terms which are statistically significant at the 1 percent and 5 per cent level, respectively. Thus, there is clear evidence of volatility during the period, which was unmitigated for some time.

Table 4: GARCH Output for Price Earnings Ratio

Variable	Coefficient	Z-Statistics
C	2.6815	1.4021
Variance Equation		
C	2.0194	.8972
ARCH(1)	.0579	4.0277
GARCH(1)	.2798	2.4230

$R^2 = 0.9483$; Adj $R^2 = 0.9020$; F-statistics = 65.24; D-W = 1.80

Table 5: GARCH Output for Dividend

Variable	Coefficient	Z-Statistics
C	0.6050	0.8249
Variance Equation		
C	2.9972	2.2301
ARCH(1)	0.1179	1.9740
GARCH(1)	0.2187	1.1180

$R^2 = 0.93$; Adj $R^2 = 0.92$; F-statistics = 80.7; D-W = 1.9

Table 5 contains the result of the volatility estimation for the dividend. The mean equation in the result shows that volatility in dividends persists for a considerable length of time. Nevertheless, only the GARCH terms pass the significance test using the z-values at the 5 percent level. This implies that although evidence of volatility exists in dividends, the volatility has not been so severe.

Asymmetric GARCH Estimates

In the ARCH and GARCH estimation information regarding returns, the direction has been ignored, only the magnitude matters. In broad-based equity indices, it has been proven that higher volatility is endemic in market decline than market increase. This means that negative shocks (bad news) have a greater effect on volatility than positive shock (good news). That rising market has lower volatility than the falling market because bad news reduces the stock price.

The leverage effect is determined with the asymmetric GARCH approach in table 6.

Table 6 reveals evidence of strong leverage effects. The results however point out those direct (positive) shocks spurs market volatility more than the inverse (negative) shocks of the same magnitude during the studied period. Thus, good news increases share price volatility than bad news in the market. Also, long memory volatility in stock price was detected using T-GARCH (1, 1) model in addition to the leverage effect. In this approach variance process is not mean-reverting as ARCH and GARCH effects evaluate to one (1), meaning that shocks triggering dynamic volatility appear permanent. Also, volatility clustering was confirmed in the result. This approach is really unlike GARCH (1, 1).

Table 6: AR (1)- TGARCH (1,1) Estimation

Dependent Variable: Stock Price	
Variable	Coefficient
Constant (M)	-0.0653 (-1.445)
AR (1) (M)	0.893 (-0.6321)
Constant (V)	0.323 (9.24)*
ARCH 1 (V)	0.047(8.72)*
GARCH 1 (V)	0.226 (15.3)**
Asymmetry (V)	-0.009 (-18.1)*
AIC	-5.47
SIC	-5.22
HQC	-4.82

***(**) denotes significance at 5% (1%) level**

Figures in parenthesis are significance values

Sunspots

In order to examine the existence of sunspots in the Nigeria bourse in the period characterizing 2007Q4 to 2008 Q4, a peak period analysis is carried out as shown in the table below:

Table 7. Returns Rates and Volatility in the NSE

Year	Mean	Std. Deviation	Return /Risk Ratio
2007Q4	4.70	4.84	1.22
2008Q1	-4.27	9.91	-0.78
2008Q2	-3.05	18.15	-0.18
2008Q3	-4.2	21.20	-0.83
2008Q4	-0.81	20.69	-0.67

Source: Author's computation (2018): Underlying quarterly data from NSE and CBN

The table shows that the three highest fundamental deviations in ascending order were recorded in 2008Q2, 2008Q3, and 2008Q4, with corresponding risk values of -0.18,-0.83, and 0.67 respectively. Thus, these periods were characterized by upper spikes, depicting peak period in fluctuation in asset prices perceived irrationality on the part of market participants. The values show evidence of sunspots in the Nigeria Capital Market during the period, in which certain macroeconomic and exogenous factors along with other intrinsic characteristics of the market contributed to spikes.

CONCLUDING REMARKS AND RECOMMENDATIONS

The paper sought to investigate the speculative bubble existence and sunspots in the Nigerian Capital Market using evidence from ten banks in Nigeria over the period 2007Q4 to 2008Q4. Employing chronological analyses, involving unit root tests, the test of co-integration, GARCH models, and Asymmetric GARCH

estimation, and finally a peak-period analysis, the empirical results reveal the existence of speculative bubbles and sunspots in the bourse during the period.

Given the empirical findings, it is important that result-oriented measures that will guarantee the operational efficiency of the capital market to be put in place to eliminate distortionary and inhibiting forces. In particular, efforts should be made by the regulatory authorities; particularly SEC to articulate ways by which information asymmetry may be minimized to eliminate the possibility of market frictions.

In this regard, efficient dissemination of information through a well-developed institutional mechanism should be developed. In addition, capital market regulators should guide against arbitrariness on the part of market participants. Importantly, the development of early warning signal models (EWSM) is imperative in this respect, as they can help detect the earliest possibility of a financial bubble and financial crisis.

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AN ASSESSMENT OF THE DETERMINANTS OF EXTERNAL DEBT SERVICE IN NIGERIA

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Abstract:

The study examined how variation in the commodity prices, interest rate and exchange rate affect external debt service in Nigeria for the period of forty years beginning from 1981 to 2020. Therefore, the study employed Capital Recovery Theory and Auto-Regressive Distributed Lag technique to evaluate the model used in the cause of this research work. The results of the study confirmed empirically the widely held opinion that increase in commodity prices enhance the capacity of any country to service its external debt. In addition, the inverse relationship of exchange rate and interest rate to external debt service demonstrate that a reduction in the exchange rate and interest rate equally enhance external debt repayment. However, the external debt service with significant exchange rate movement would probably worsened the capacity of external debt service. The findings of this study emphasizes the need to intensify efforts aimed at improving commodity prices and also reduction in the interest rate as well as exchange rate as these are considered necessary to enabling external debt service.

Keywords: External Debt Service, Commodity Prices, Exchange Rate, Interest Rate, Capital Recovery Theory and Nigeria

INTRODUCTION

One of the unresolved issues of the macroeconomics today is the Nigeria external debt burden. Efforts have been expended in various studies in the areas of providing measures, causes and solutions to the problem (Adonia & Eftychia, 2018). Besides, the creditors perfected theoretical models for prescribing policy guidelines that would enable them to maximized the repayment of their loans. Today Nigeria, crumbling under the weight of the debt burden, reacted with caution fearing that outright repudiation would cut off new loans. The dilemma is that Nigeria is quietly still negotiating and taking new loans which would eventually mature into debts even for the next generation and even suffering from the burden of the existing debt. The new capital inflow is required to replenish ageing infrastructure, provide new investment that will lead to the lessening of the debt burden.

However, this relief has not materialized. Some indicators of the debt burden, namely: external debt service to export and service ratio and external debt to export and service ratio have been deteriorating. For instance, the Nigeria total external debt to export ratio worsen from 97.2 in 1980 to 222.3, 322.9 and 339.5 per cent in 1983, 1986 and 1991 respectively. The corresponding values for external service to export for the same period were 10.9, 15.8, 28.2 and 19.8 per cent. No doubt, Nigeria debt burden ratio has been going up. The external debt-export ratio rose from 31.9 per cent in 1980 to 169.6, 397.5 and 257.1 in 1983, 1988 and 1991. For this periods, the external debt service-export ratio increased from 9.1 per cent to 23.6 29.3 and 25.8 per cent.

The major reason for the deteriorating debt burden are the continuing fall in the price of export commodity and the unfavorable terms of trade. Other factors responsible for the debt burden are the exchange and interest rate fluctuation. The domestic macroeconomic policy had also played major roles in retarding Nigeria ability to grow out of the debt burden by a way of creating uncertainty which compounds the problem of economic panning.

The main objective of this study is to examine the empirical relationship between external debt service on the one hand and the commodity price, exchange rate, terms of trade and loans terms (interest rate). External debt service is the portion of the current revenue used in paying past expenditure, and therefore not available for domestic economy in the current period. The interpretation of this is that external debt service is likely to crowd out economic growth and development as a result of its negative effect on investment. This paper consists of five sections. The next section is literature review. Section 3 presents the methodology. The results and discussion of findings in section 4 while conclusion and policy recommendations are in section 5.

LITERATURE REVIEW

In line with the conflicting argument between two schools of thought on the determinants of external debt service in the developing countries where internal factors are identified as the fundamental causes of external borrowing. Besides, others believed in external factors. However, the different views do not matter because of the near interrelationship of the factors that stem from the combination of both domestic and external conditions in the debtor countries (Holder, 2020). Internal factors lie within the domestic economy and poor macroeconomic environment such as low GDP growth rate, fiscal deficit, exchange rate instability and low domestic savings are the reason for external borrowing. The external factors are viewed beyond the control of the debtor countries because it involves external policies such as international lending rate, oil price and terms of trade etc. (Kim, 2017; Obadan, 2014).

Ajayi, (2016), investigated the causes of external debt in Nigeria and discovered that federal deficit, terms of trade, interest rate and exchange rate; all worsen the debt ratio. In addition, Nyatepe, (2010) examined external shocks, domestic policy responses, and debt accumulation for Nigeria and Indonesia and found out that substantial part of external debt in the two countries increased due to the financing of the capital flight. Moreover, inappropriate policy response jacked up the Nigeria external debt, besides Indonesia was not affected by the debt crisis by reason of its ability to put in place efficient exchange rate management and fiscal responsibility.

In another study, Edo (2017) carried out a comparative study on the determinants of external debt service between Nigeria and Morocco using the Error Correction Mechanism for the period of twenty-seven years beginning from 1985 to 2001. The results found out that low domestic savings and excessive government expenditure, terms of trade, lending rate, reduction in the price of export are responsible for the debt build-up

Claessens (2009), applied portfolio theory to establish the optimal currency composition of external borrowing that would minimize the negative effects of both exchange and interest rate fluctuations and the commodity price movements. The study summarized the factors that affected the optimal external debt composition in the adopted model which include: the relationship and the variation between the exchange rate and domestic price movement and also the exchange rate and consumption expenditure, the expected cost of borrowing, the correlation and co-variance of the exchange rate and expected receipts and payments in the foreign currency. The objective is to hedge against commodity price and exchange rate movements, the study that the co-variances between commodity prices and exchange rate and the expected net foreign currency payments are the major factors affecting optimal external debt composition.

Greene (2017) examined the Sub-Saharan debt problem and pointed out the declining commodity prices, increase in the interest rate, falling in the net capital inflows and domestic policies as contributory factors to increasing debt burden. Among the measures he advocated were outright debt forgiveness, reducing debt to more concessionary terms, establishment of international facility to back-back outstanding debt

Anorou (2018) examined the determinants of external debt using the panel data regression for twenty-nine HIPC countries of Sub-Saharan Africa covering the period 1984 to 2015 and found out that poor macroeconomic performance and institutional factors such as corruption and bureaucratic bottleneck are the major factors affecting external debt. In the similar study, using the panel data for the Caribbean nations for the period of 1987 to 2015, Greenidge (2016) found out that real effective exchange rate, decline in output, export decline and real interest rate are the major determinants of the accumulated external debt in the region. These phenomena were corroborated by Ojo (2018) who in addition, pointed out commodity price shocks, interest and exchange rate fluctuation, reverse resource flows to developed countries and domestic economic policies as key factors responsible for the worsening of external debt situations in the sub-region.

Several strategies have been applied to reduce the indebtedness in Nigeria. Anyanwu (2014) enumerated debt rescheduling, cancellation of concessional debt, increased concessional debt relief as measures to relieving the

debt burden. Market-based debt reduction schemes such as debt buy-back, the Brady Initiative, debt-equity swaps, exit bonds have been proposed and analyzed in Detragiache (2001) and Kletzer (2000). These two authors pointed out the relevance in the reduction of interest rate and availability of new money as effective means of debt relief.

Diwan (2019) pointed out the importance of linking trade and development to debt strategies and postulated that debtor countries could pursue import-substitution and export oriented policies as a solution for the rising interest rates and external debt as well as declining terms of trade.

From the reviewed literature, Edo (2017) carried out a comparative study of the determinants of external debt service between Nigeria and Morocco using the Error Correction Mechanism. In order to fill the gap and add value to knowledge, the author of this study proceeds

to apply Auto Regressive Distributed Lag (ARDL) technique having found from the results of unit root conducted that the variables were not integrated in the same order and also went beyond the scope of Edo (2017) in order to appropriately capture the objective of the study and the specification of our model Capital Recovery Theory appropriately.

METHODOLOGY

Theoretical Framework and Model Specification

The various literatures reviewed in this study highlighted some of the factors affecting Nigeria and other African countries external debt service and the strategies to reduce the burden. However, no effort was made including Edo (2017) to test for the empirical relationship between the factors and external debt service. Therefore, to close this gap remains the subject in this section where we found „Capital Recovery Theory“ relevant.

The model, based on the „Capital Recovery Theory“ states that the annual payment, „A“ can repay a loan „P“ in a given period „N“ at interest rate „I“ is given by

$$A = \frac{Pi(1+i)^n}{(1+i)^{n+1}} \dots\dots\dots (1)$$

Given equation 1, above A stands for the external debt service ie interest and principal (TDS), while P represents the initial debt stock (D) bearing in mind the exchange rate effect „e“, therefore, the external debt service in one country in terms of the other will be:

$$TDS = \frac{eDr(1+r)^m}{(1+r)^{m-1}} \dots\dots\dots (2)$$

Where r = interest rate, e = exchange rate, m = maturity terms

Hence interest component for the aggregate debt service „I“ is

$$I = eD(1+r)^m \dots\dots\dots (3)$$

We can assume here that the external debt service was not repaid which resulted to recapitalization of the debt service and / or interest. In fact, interest recapitalization comprises putting together interest at the given period and the principal of the debt owed, hence the new debt becomes the principal and the capitalized interest (2004b).

Algebraically, new stock of debt „D“ at the end of a grace period, „g“ becomes

$$D = [D + D(1+r)^g] \dots\dots\dots (4)$$

The new debt service after interest recapitalization can be obtained from equation (4), thus:

$$TDS = \frac{eD[1+(1+r)^g]r(1+r)^m}{(1+r)^{m-1}} \dots\dots\dots (5)$$

Given the equation 5, it could have been seen that the initial debt stock, exchange rate in which the debt is denominated, interest rate on the debt, grace period and maturity terms of the debt all of these affect the magnitude of the external debt service. Moreover, factors that can warrant the capacity of a country to service its owed debt can as well affect the external debt service by way of increasing or decreasing the stock of the debt „D“. The key factors include commodity price variation and the terms of trade. The interpretation of the equation 5 is that a rise in exchange rate, interest charges, terms of maturity as well as the grace period will lead to the increase of the external debt service, while a rise in the commodity prices and favorable terms of trade will reduce the amount of debt stock owed to the foreign creditors by improvement in the capacity of the debtor country to service its debt. Hence, the factors identified from the Capital Recovery Theory justify the specification of the model for this study. The model is here specified in linear form below:

$$\ln(D_t) = \beta_0 + \beta_1 \ln(P_t) + \beta_2 \ln(e_t) + \beta_3 \ln(r_t) + \mu_t \dots\dots (6)$$

Representing the variables in the model by:

It is expected given by the a priori that the coefficients of the parameters estimate of this study will be positive. ie $\beta_1 > 0$, β_2 & $\beta_3 < 0$

Below is the general form of ARDL and is represented by equation (7) below;

$$\Delta Z_t = \beta + \sum_{i=1}^k \alpha_i + \Delta Z_{t-1} + \Psi_{t-1} + \forall_t, \dots \dots \dots (7)$$

Where:

Z_t = vector of stationary variable, β is a constant vector, α is the coefficients of the estimated variables, K is the numbers of lags, Ψ is the long-run variable and $\forall$ is the vector of error term.

Equation (7) below presents the operational model of the ARDL

$$\Delta \ln D_t = \Phi + \sum_{j=1}^n \partial_i \Delta \ln D_t - 1 + \sum_{j=1}^i m_i \Delta \ln P_t - 1 + \sum_{j=1}^m \alpha_i \Delta \ln e_t - 1 + \sum_{j=1}^i \alpha_i \Delta \ln r_t - 1$$

$$+ \alpha_1 \ln D_{t-1} + \alpha_1 \ln P_{t-1} + \alpha_1 \ln e_{t-1} + \alpha_1 \ln r_{t-1} + E_t \dots \dots (8)$$

The error correction model for the ARDL: is given below:

$$\Delta \ln D_t = \Phi_0 + \sum_{j=1}^k \partial_i \Delta \ln D_t - 1 + \sum_{j=1}^p \Psi_i \Delta \ln P_t - 1 + \sum_{j=1}^y \forall_i \Delta \ln e_t - 1 + \sum_{j=1}^m \alpha_i \Delta \ln r_t - 1 + \alpha e_t - 1 + r \dots (9)$$

where e_{t-1} stands for the error correction term and this accounts for the ordinary least squares residual series emanating from the long run co-integration output.

Where

$$e_{t-1} = (D_{t-1} - \beta_0 - \omega_1 P_{t-1} - \omega_2 e_{t-1} - \omega_{it-1}) \dots \dots \dots (10)$$

Given in equation (10), it expresses the fact that the linear combination of all the variables used in the model have to be stationary at level for the stochastic error term to be statistically significant.

DATA SOURCES

The study uses secondary annual time series data covering the period of forty years beginning from 1981 to 2020. The data were collected from the various sources such as Annual Report and Statement of Account, National Bureau of Statistics and other documents from Central Bank of Nigeria (CBN).

RESULTS AND DISCUSSION OF FINDINGS

Units Root

This study analyzed the time series properties of the variables by using Augmented Dickey Fuller (ADF). The important assumption of the Dickey-Fuller (DF) test is that error terms are independently and identically distributed. In order to provide solution to the limitations of the test Dickey and Fuller developed another test known as Augmented-Dickey Fuller to adjust the DF test which will help to take care of the possible serial correlation in the error term by adding the lagged difference terms to the regressand. The ADF model is used for testing for a random walk against a stationary auto regression process of order one [AR(1)] with drift time trend which is specified as:

$$\Delta Y_t = \varphi_1 + \varphi_2 t + \Psi Y_{t-1} + \sum \partial_i \Delta Y_{t-1} + \mu_t \dots \dots (11)$$

Where

φ_1 = a drift (constant); $\varphi_2 t$ = a time trend; μ_t = independently and identically distributed (iid)

The question occurred to mind here is that, what is the optimal number of lags of the dependent variables that are needed in a given ADF model? Pesaran and Pesaran (1997) argued that the use of ADF for unit root test is not powerful enough in infinite large sample, hence Phillip –Peron is used as an alternative test. This test is robust with respect to unspecified autocorrelation and heteroscedasticity in the disturbance process of the test equation

Pillip-Peron (PP) unit root test replaces the use of ADF which has been arbitrary. The test is an improvement of the ADF test that uses non-parametric statistical technique to take care of the serial correlation in the error term (Nyong, 2003).

Table 1: Unit Root Tests

Augmented Dickey Fuller (ADF) Unit Root Test Results

At Level			At 1 st Difference		
Variables	ADF Test	5% C. Value	ADF Test	5% C. Value	Order of Integration
D	2.7001	-2.9611	-5.4024	-2.9562	I(1)
P	2.3453	-2.9611	-4.3273	-2.9611	I(1)
E	2.3312	-2.9611	-7.5002	-2.9562	I(1)
R	-0.6014	-2.9541	-6.7762	-2.9562	I(1)

Source: Author Regression Output

The results indicate that there is a unit root problem in each of the variables used in the study. The decision rule is that the null hypothesis (H_0) should be rejected if ADF statistic is greater than the critical value at the 5 per cent significance level. Given by the result, none of the variable is stationary at level but they were found unit root free at first difference, hence, we can now reject the null hypothesis.

Table 2: Phillip=Peron (PP) Unit Root Test Results

Variables	ADF Test	5% C. Value	ADF Test	5% C. Value	Order of Integration
D	-3.6517	-2.9550	-	-	I(0)
P	1.4801	-2.9550	-5.9411	-2.9581	I(1)
E	0.3621	-2.9550	-6.3667	-2.9581	I(1)
R	1.6724	-2.9550	-3.2651	-2.9581	I(1)

Source: Author Regression Output

Given the results of the Phillip-Peron, the external debt stock (D) is found stationary at level I(0) while the other variables which were found unit root presence, became stationary in their first difference.

Table 3: Lag Order Selection Criteria

Variables	AIC Lag Length			SBC Lag Length			Lag Length Selected	
	0	1	2	0	1	2	AIC	SBC
D	8.5440	2.6511	1.4412*	8.4065	2.6402	27403*	2	2
P	5.7123	3.0871*	1.5661	5.6201	3.1762*	3.5256	1	1
E	23.0476	22.8848*	1.5446	23.2311	22.9801*	23.0462	1	1
R	23.7707	21.7467	1.5446*	238224	21.7482	212361*	2	2

In order to select the optimal lag length for this model, the study uses the autoregressive model of order 2 (AR-2) generating the results of Akaike information criterion (AIC) and the Scharz Bayesian Criterion (SBC), However, the study uses the result of the Akaike information Criterion for choosing the optimum lag length for the estimated model in a bid to obtaining the long-run coefficient. The results obtained for chosen the optimum lag length supported the use of Autoregressive Regressive Distributed Lag model of order (2112) given in table 3 above.

Table 4: ARDL Bounds Test

Test Statistic	Value	K
F-Statistic	12.36*	3
Critical Value Bounds @		
Significance	I(0)	I(1)
5%	2.52	3.64**

Source: Author Regression Output

Based on the principle of the ARDL bounds test for co-integration, the lower bound critical values (LCV) shows that the exogenous variables are integrated at order zero I(0) while the upper bound critical value assumes that the independent variables are integrated at order one I(1). Given by the results, the long-run relationship exists among the variable as the value for F-statistic of 12.36 exceeds the upper critical bound value of 3.64 at 5 per cent significance level. Therefore, we soundly reject the Null Hypothesis (H_0) of no long-run significance relationship among the variables in this study.

Long-run ARDL Estimate after the Bound Test with External Debt Stock (D) as Dependent Variable**Table 5**

Variables	Coefficient	t-statistic	Prob.
C	-0.102.6634	9.4728	0.0000
LnP	0.0148	0/0362	0.0025
Lne	-0.0147	2.7322	0.0234
Lnr	-1.7709	0.0152	0.0144

Source: Author Regression Output

From the result, it can be observed that the coefficient of commodity price (P) is directly signed and statistically significant at the 5 per cent level. The estimate indicates that in the long-run, External Debt stock is highly influenced by the commodity price level with the estimated value of 0.0148 indicating that the level of external debt will reduce by 1.5 per cent in response to 1 per cent rise in the commodity prices. This is in line with a priori expectation

The exchange rate coefficient exerts a significant and inverse relationship outcome with the external debt. A reduction in exchange rate as indicated given the estimated coefficient, implies higher capacity for debt repayment this further signifies that the value of naira has appreciated against the dollar meaning that a lower quantity of our domestic exports will guarantee higher payment of external debt. This is also in line with the a priori prediction

The negative sign observed in the estimated coefficient for interest rate suggest that a reduction in interest rate reduces the amount of external indebtedness. The reason that justifies this is that there follows a reduction from the tax away of our total revenue by the external creditors by reason of interest rate repayment upon the principal., which means that Nigeria is left with much revenue to stimulate the economy for further possible external debt repayment, by implication the amount of external debt reduces. The result of this study is also in conformity with that of Arorou (2018) whose finding established a direct relationship between the external debt and the interest rate being a determining factor. The study hereby recommends a sustainable interest rate that will guarantee possible debt repayment.

Error Correction Representation After the Bounds Test Having External Debt Stock as Dependent Variable**Table 6:**

Variables	Coefficient	t-value	p-value
C	4.0233	2,1138	0.0031
DlnD(-1)	1.6643	8.5421	0.0000
DlnD(-2)	-0.1770	-3.5528	0.0034
DlnP(-1)	-0.14323	-0.1125	0.0154
DlnP(-2)	0.0346	8.6122	0.0054
Dlne(-1)	-0.0176	-2.0338	0.0322
Dlne(-2)	0.0351	5.4201	0.0121
Dlnr(-1)	0/0557	0.5643	\0.0722
Dlnr(-2)	-0.2234	-3.1263	0.0052
Ecm(-1)	-0.7151	-2.7602	0.0025
R-squared = 0.87			
Adjusted R-squared = 0.86			
F-statistic = 49.31			
DW = 1.95			

Source: Author Regression Output

A cursory look at the table 6 above shows that in the short-run, some variables employed in the study conform to our a priori prediction while some acted in contrary. The commodity price lagged by two-year period, exchange rate lagged by one-year period as well as interest rate which is also lagged by two-year period conform to our a priori expectation. The others did not, though they are statistically significant at the 5 per cent level. The conformity of the commodity price of our export goods enhances the possible repayment of external debt for the reason being that the total revenue arisen from the sales of exported goods increased hence the total debt stock diminishes.

Exchange rate lagged by one-year period, the result established that a reduction in exchange rate increases the capacity of our domestic economy for possible debt repayment which also reduces the level of external

indebtedness. Its one-year lagged period, the results indicate that is statistically significant to external debt. The result obtained in this study holds the same findings with Edo (2017) who empirically examined the determinant of external debt service in Nigeria and Morocco using the error correction mechanism. In the results, Edo (2017) established that reduction in the exchange rate remained a responsible factor to our external debt reduction. The findings also conform to the theoretical phramework used in this study that reduction in exchange rate will lead to a decrease in the amount of external debt stock owed to the foreign creditors by improvement in the capacity of the debtor country to service its debt.

The result of interest rate lagged by two-year period also justifies external debt reduction by reason of its inverse relationship with external debt stock. By implication, a reduction in interest rate implies absence of crowding out investment to foreign creditors for reason of a minimal tax away of our total sales revenue to the foreign creditors. By further implication, Nigeria is left with much revenue to induce investment and this will lead to further possible debt repayment, in due time Nigeria can be debt free. Further interpretation of this findings demonstrate counter cyclical effect to induce investment vis-à-vis external debt reduction in the economy.

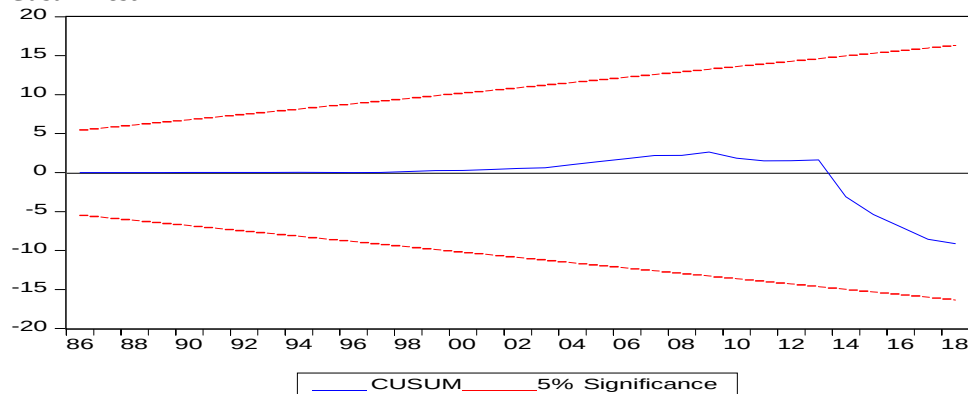
The value of Durbin-Watson (DW) statistic obtained in this study is 1.95. This justifies absence of serial correlation for reason being that the closer the DW value is to 2.0 the better the evidence of the absence of the serial correlation. It also shows that the rule of thumb of DW is 2.0 being the case of no autocorrelation is guaranteed because 1.95 can be approximated to 2.0. Based on this, we can soundly reject the null hypothesis of presence of serial auto-correlation in our estimated model.

The coefficient of the error correction mechanism (ECM) is correctly signed and the prob. Value is statistically significant at the 5 per cent level. The ECM value indicates that the model will adjust back to the long-run equilibrium in the following period at the speed of 71 per cent. More-over, the significance of the ECM reveals a confirmation of the existence of a long-run equilibrium relationship between the external debt service in Nigeria and its determinants in the study

Stability Test

For us to ascertain robustness of the model, the study performs diagnostic tests as shown in figure 1 below/

Figure 1: CusumTest



The stability test performed using Cusum test as shown in figure 1 above reveals stability. This is because, the observed bound is found lying between the critical bound (dotted bound) lines, hence it can be inferred that the model at 5 per cent level of significance is stable.

CONCLUSION AND POLICY RECOMMENDATIONS

Given the log-run results, the oefficient of commodity price , exchange rate, and interest rate are correctly signed in line with our a*priori expectation. These findings agree with the short-run estimate of commodity price lagged at two-year period, exchange rate lagged by one-year period and interest rate lagged two. The interpretation of the observed conformity implies that a rise in the commodity price of the export goods, and a decrease in the exchange rate amd interest rate will lead to improvement in the external debt service thereby leading to reduction in the external debt stock. Based on these findings, the study therefore, give the following recommendations:

1. The government should ensure that the policy gears towards the strengthening of the international commodity agreements are in place in order to stabilise and raise the exported commodity price which is capable to increasing our foreign exchange earnings.

2. Government should from time to time monitor the foreign exchange rate market in order to reduce the unnecessary exchange rate price increase imposed by the arbitrage in the parallel market
3. External loans of high interest rate should not be obtained from foreign creditors, for the reason being that a higher interest rate implies a higher crowding out domestic investment profits to the foreign creditors and which is not available for the domestic economy thereby constraining the external debt repayment.

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ASSESSING THE EXTERNAL FACTORS THAT INFLUENCE CORPORATE ENTREPRENEURSHIP IN MANUFACTURING COMPANIES IN NORTH – WESTERN NIGERIA

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Abstract:

Corporate Entrepreneurship is acclaimed to have potentials of contributing greatly to the overall economy of a nation through the constant development of innovative strategies in response to the external environment. Hence, this study explicate the external factors that influences CE and then empirically assess the effect of these external factors on corporate entrepreneurship in manufacturing companies in North-West Nigeria. The study adopted a survey research design. A total of 135 manufacturing companies were sampled from 206 members of Manufacturers Association of Nigeria in North-West Nigeria using simple random sampling technique. Primary data were collected through a structured questionnaire. Data were presented and analysed using descriptive statistics, correlation and hierarchical regression analysis. Findings show that Market Dynamism, Environmental Hostility, Socio-Cultural Effects and Political Regulatory Effects have significant positive influence on CE as shown by $\beta = 0.414, 0.320, 0.453$ and 0.237 at 5% level of significance. The study therefore concluded that CE in manufacturing companies in the North-West Nigeria is affected by external factors and the social life styles and culture of Nigerians influence CE, and political and legal structure equally influence CE in Nigerian business environment. The study recommended that the Nigerian government should intensify efforts in check mating the activities of smugglers and this can be done by making existing laws on this matter more effective. Also, they should assist manufacturing companies in the campaign for attitudinal change toward made in Nigerian products which can be achieved through the enactment of laws that will favour locally made products.

Keywords: Dynamism; Hostility; Organization; Socio-Cultural; Political; Regulatory

INTRODUCTION

Corporate Entrepreneurship (CE) is an emerging area of scientific enquiry in the field of entrepreneurship. Both past and recent researches on CE have highlighted several importance of CE to both the organizations and an entire nation. Existing literatures (Antoncic & Zorn, 2004; Erasmus & Scheepers, 2009) have linked the importance of CE to performance of an organization usually in terms of growth and higher profitability. Furthermore, CE has been recognized as one of the major elements of organizational development (Turro, 2012).

One of the most significance of CE to an organization lies on its potentials to create and maintain competitive advantage through continuous innovations (Sebora & Theerapatvong, 2009). Scheepers (2007) posits that innovations can generate new products, processes, and organisation systems that can set distinguish a company from its rivals. For example Apple Inc, an American computer and electronic manufacturing company has been acclaimed as one of the leading companies in computer manufacturing as a result of her frequent innovations. Many big organizations (for example Microsoft, Amazon, Facebook etc) account for a larger percentage of the nation's economic output and employment (Sathe, 2003). Increase in CE activities will improve a nation's

balance of payment as more revenue will accrue from exportations. Also, CE can lead to expansion of business organizations thereby creating employment opportunities for the country.

Furthermore, CE presents minimal risk when compared with an independent entrepreneurship; because as a corporate entrepreneur, one is already in an established organization with enough resources to venture into new line of business and has a strong ability to mitigate risk (Wikipedia, 2013).

The present state of business environment is full of many uncertainties resulting from factors such as globalization, which pose a great threat to the survival of many business organizations. Thus for business organizations to be able to survive and achieve their mission, they need to imbibe the culture of CE. However, this will require them to develop innovative strategies in response to their external environment: they should be able to identify opportunities and threats that may be brought about as a result of unfavourable changes such as declining demand for the organization's products, competitive rivalry, social and demographic changes, legal and political changes.

Statement of the Problem

Nigerian economy, particularly the manufacturing sector has suffered a huge set back due to its wide exposure to the global economic pressures such as global economic meltdown witnessed in 2008, the current fluctuation of exchange rate, the effects of policy changes by both past and present such as Structural Adjustment Programme (Nyor & Chinge, 2014), smuggling activities, poor and absence of infrastructural facilities, and most importantly the insecurity that has taken over all parts of the country.

These had persisted over time and made the country dependent on importation, thereby leading to a total collapse of the sector. Thus, there is an urgent need to prevent further decay of this sector by finding a new way of fostering competitiveness through constant innovations. In other words, it is imperative for manufacturing companies in Nigeria to inculcate the culture of CE in order to ensure continuous survival and remain profitable. However, CE is a process driven by many forces one of which are the forces in the external environment. Hence, a deep investigation into these forces as identified by the literature is important.

Firstly, most business organizations in Nigeria, particularly manufacturing companies have been operating under a harsh socio cultural and economic environment. For example, most Nigerians have negative attitude towards any product manufactured locally (Gunu & Tsado, 2015). Thus, some manufactures would have to inscribe 'made in China' or 'made in England' on their products before their products could sell in Nigerian market. More so, the current insecurity challenges in the northern part, and the militancy in the Niger delta region have also made the operating environment difficult for most business organizations in Nigeria. Furthermore, increase in the activities of smugglers due to the poor nature of the country's border, poor state of road and other infrastructural facilities, challenges of power supply, stringent regulatory and political instability have contributed to creating a turbulent environment for most manufacturing companies in Nigeria.

The Manufactures Association of Nigeria (MAN) in a survey carried out as part of its membership operational audit in 2010, recorded that of the 2780 registered members, a total of 839 manufacturing firms closed their factories in 2009. This is due to their inability to cope with the challenges posted by the harsh operating environment in Nigeria (Nyor & Chinge, 2014). For instance, the Dunlop which was the only company manufacturing tyre in Nigeria closed her company in 2008 and resorted to import from her factory in South Africa as a result of power problem and sudden government policy in favour of importation, while many textile companies particularly in the northern part of the country went into extinction.

Therefore, the external environmental conditions in Nigeria business environment have created serious doubt as to whether or not the theory of CE is applicable in manufacturing industry in Nigeria. Given this scenario, it is difficult to ascertain the nature and dimensions of CE activities in this sector. This signifies a knowledge vacuum, and the filling of this vacuum formed the basic problem that this research was designed to address. Furthermore, in terms of research, CE in Nigeria has received little attention despite the importance attached to it by both the organizations and the academics across the globe. Till date, there is no much evidence of empirical research on the specific external factors that influence CE in Nigeria except the recent work of Alarape, (2009). Therefore, there is a need to carry out a comprehensive study on CE putting into consideration the factors in the external environment.

Research Objectives

The broad objective of this research was to assess the specific external factors that influence CE in manufacturing companies in North-Western Nigeria. However, specific objectives include to:

- i. Determine whether Market Dynamism influences CE in manufacturing companies in North Western Nigeria.
- ii. Examine whether Environmental Hostility influences CE in manufacturing companies in North-Western Nigeria.
- iii. Determine the effect of Socio-Culture on CE in manufacturing companies in North-Western Nigeria.
- iv. Examine the influence of Political-Regulatory environment on CE in manufacturing companies in North-Western Nigeria.

LITERATURE REVIEW

External Factors that Determine CE

The external factors comprise those factors in the external environment that can foster or impede CE in an organization. These factors constitute everything beyond organizational boundary that is capable of affecting organizational performance either directly or indirectly. Zain and Hassan (2007) describe these factors as environmental Environmental Hostility. External factors have been described as those forces that are external to the organization such as Market Dynamism (Adonisi, 2003; Schepers, 2007) industry growth, customer demands, heterogeneity (Adonisi, 2003; Schepers, 2007) and external technological development that influence corporate entrepreneurship behaviours and activities.

Market Dynamism

Market Dynamism relates to the changes and uncertainties in the business environment. Uncertainty in this regards, is the 'difference between projected and actual outcomes, and results from the limited availability of information for decision making' (Simon in Ensley, Pearce & Hmieleski, 2006). Adonisi (2003) posits that dynamic environments create precipitating events in a corporate environment. Continuous change in the business environment as a result of Market Dynamism may be source of abundant opportunities (Alarape, 2009). Ensley et al. (2006) in their study titled 'The moderating effect of environmental Market Dynamism on the relationship between entrepreneur leadership behaviour and new venture performance', observe that environmental Market Dynamism appears to moderate the effects of entrepreneur leadership behaviour on new venture performance.

Environmental Hostility

According to Zain and Hassan (2007) 'environmental Environmental Hostility implies the environmental pressure caused by changes in the market place, the industry, the competition in term of product quality and price and consumer taste'; also, suppliers, institutional bodies (legal and regulatory (Sathe, 2003)) with which the organization interacts (Adonisi, 2003).

Generally, two hostile environmental conditions may affect corporate entrepreneurs; these include unfavourability of change and competitive rivalry (Scheepers, 2007; Antoncic & Hisrich, 2001). According to Scheepers (2007), existence of too many competitors increases rivalry, which can lead to a paucity of readily exploitable market opportunities, as well as market, and/or product-related uncertainties. 'In a hostile environment, the intensity of competition exerts more pressure on the firm (Lumpkin & Dess, 2001). However, Davis (2006) argues that competitive orientation is rather a strategic factor and not external or environmental factor. Contrary to the findings of researches particularly from USA, the findings of the study of Scheepers (2007) indicates that Environmental Hostility, as measured by unfavourability of change and competitive rivalry, did not lead to increased levels of entrepreneurial intensity in South African organizations.

Heterogeneity

Heterogeneity indicates existence of different segments of the market with varied characteristics and needs that is served by the organization (Adonisi, 2003). Heterogeneity creates threats to the firm, either through increase rivalry or decrease demand for the products (Alarape, 2009). Business organizations need to be proactive in risk-taking and innovative in order to take advantage of potential arbitrage and connect different markets so as to maximize the opportunities that may also be created by heterogeneous environment (Alarape, 2009). This research used these variables to assess external environmental factors that predict corporate entrepreneurship in the Nigerian manufacturing industry. Many researches in the past (Lumpkin & Dess, 2001; Scheepers, 2007; Machuki & Aosa, 2011; Alarape, 2009) have used these dimensions to study external factors of CE. However, present study tends to include variables that are peculiar to the nature of business environment in Nigeria such as socio – cultural and political factors (see also Guth & Ginberge, 1990) that can determine CE.

Furthermore, external factors pose challenges and offer new opportunities on which organisations can take advantage by acting in creative and innovative manners. Scheepers (2007) in her opinion states that business organizations should instigate innovative strategies or formulate responses to the external environment that

Surrounds them. Dauda and Akingbade (2011) support this opinion by saying that innovation is a basic requirement for a man to satisfy his changing needs and cope with the demand of the dynamic environment. The argument in this study is that which of these external factors can instigate or hinder manufacturing in Nigeria to think and act in a creative and innovative manner?

However, it is important to note that external factors are not the only variables influencing CE, internal factors, strategic factors and personal factors also play a major role. In addition, Scheepers (2007) argues that 'external business environments differ between countries and between developed, developing and transitional economies. It is, therefore, questionable whether the theory of external antecedents is equally applicable to different countries and different economies.

Relationship between External Factors and CE

Theoretically, external factors influence Corporate Entrepreneurial activities (Scheepers, 2007). External business environment (Market Dynamism, heterogeneity and Environmental Hostility) has the potentials to create both traits and opportunities for business organizations. Turró, (2012) is of the opinion that among all the drivers of CE, external factors appear as the major and important factors. For example, increase in demand for new products in an industry leads to increased consumer demand, which compels enterprises to act entrepreneurially, thus leading to higher levels of CE activities (Scheepers, 2007). Similarly, the culture, altitude and social life styles in a particular environment can constitute a threat to the survival of the organization. Once organizations perceive this threat, they will be forced to develop innovative strategies in response to the threat which will lead to an increase in CE activities.

According to Alarape (2006), continuous change in the business environment as a result of Market Dynamism may be source of abundant opportunities for industrial growth, new technology, and demand for new products. The author maintains that business organizations may unconsciously take advantage and develop innovative strategies and be more pro-active to risk taking in response to environmental traits.

Scheepers (2007) posit that in a threatening and hostile environment, business organizations are expected to develop creative strategies in response to the perceived threat which should thus, increase CE activities. Furthermore, research has shown that Environmental Hostility always has an unfavourable effect on pro-activeness- performance relationship (Lumpkin & Dess, 2001). According to Lumpkin and Dess (2001), intensity of competition exerts more pressure on the firm in any hostile environment. Pro-activeness entails employing measures to create an environment that will give a person a competitive edge over others (Lumpkin & Dess, 2001). Lumpkin and Dess (2001) argue that reaction to competitive conditions would only be achieved if the environment is certain and stable. However, it is important to state that the debate on the influence of external factors on CE has continued to generate controversial findings by the scholars. More so, little is known on the extent to which external factors can influence CE activities (Scheepers, 2007; Morris, 1998).

Theoretical Framework

This study considered the Contingency theory as theoretical foundation. This theory was found to be relevant to some dimensions of the present study. Contingency theory is one of the classes of behavioural theories. This theory is based on the assumption that there is no better way to organize a corporation, to lead an organization, or to make decisions in an organization, instead, the optimal course of action depends upon the internal and external situations. Contingency theorists try to identify and measure the conditions under which things will likely occur (Schoech, 2006). The theory was developed by Woodward Joan, a British professor in organizational sociology in 1958 (Wikipedia, 2009). The contributors of this theory argue that the failure of previous theory such as Taylor's scientific management was because they failed to recognize the fact that 'management style and organizational structure were influenced by various aspects of the environment- the contingency factors' (Wikipedia, 2009). Schoech (2006) in his views, classified organizational contingencies into two: Internal organizational contingencies- such as people, task, technology etc. and External organizational contingencies such as Technological forces, political forces, Suppliers and distributors, Consumer interest groups, Customers and competitors, Government, Unions etc. Many studies have linked Contingency theory to many organizational variables, such as the corporate entrepreneurship (Armash, Shahnevaeie, Ghalandarzadie & Wei, 2013). However, the major concern of the present study regarding the theory discussed above is the External organizational context of the Contingency Theory.

Review of Empirical Findings

Nihal and Ata (2014) empirically examined the link between environmental conditions, organizational culture, corporate entrepreneurship and performance. The authors used correlation analysis and stepwise hierarchical regression to analyse their data. It was reported that environmental ambiguity had no significant relationship with any of the three dimensions used to capture CE (new business venture, innovativeness and pro-activeness) $r = 0.101, 0.092$ and 0.018 respectively. Similarly, munificence had no significant relationship with

innovativeness and pro-activeness, but had significant relationship with new business venture ($r = 0.238$). Market Dynamism had significant relationship with new business venture ($r = 0.164$) and innovativeness ($r = 0.174$) but had no significant relationship with pro-activeness. As further reported by the author, the result of the stepwise hierarchical regression indicated that had negative effect on innovativeness and pro-activeness dimensions of CE. The authors did not specify the nature of the business activities of the enterprises that were used for case study.

Similarly, Alarape (2009) in his study titled assessing the relationship between the perceived business environment and firm's performance focused on the SMEs in Nigeria. The author took a sample of 279 firms and used Pearson's correlation analysis. Alarape (2009) reported that Market Dynamism has a significant positive relationship with the dimensional variables of CE: risk-taking ($r = 0.236$) and pro-activeness ($r = 0.271$). Similarly, Environmental Hostility has significant positive relationship with pro-activeness ($r = 0.261$), however, the relationship between Environmental Hostility and risk – taking is not significant. Heterogeneity on the other hand has a significant positive relationship with both risk-taking ($r = 0.290$) and pro-activeness ($r = 0.185$). Furthermore, munificence has a negative, but significant relationship with risk- taking ($r = -0.171$), while the relationship between munificence and pro-activeness is not significant. It can be argued that Alarape (2009) focused on Small and Medium Enterprises where the owner may have close monitoring and supervision which may hinder employees' discretion thereby violating CE theories.

Zahra, Dharwadkar and George (2000) did a work on the effects of corporate and local environmental contexts on multinational subsidiaries entrepreneurship 581 United States of America (USA) based foreign manufacturing companies. The authors reported that Market Dynamism, Environmental Hostility and complexity are significant ($\Delta R^2 = .07$, $p < .001$) and that Market Dynamism, Environmental Hostility and complexity were all positively and significantly associated with Subsidiary Entrepreneurship ($\beta = .23$, $.20$, $.29$ respectively, $p < .05$). Scheepers (2007) reported that only Market Dynamism and un-favourability of change has significant relationship with frequency of innovation ($r = 0.35$, $p < .05$ and 0.28 , $p < .01$).

METHODOLOGY OF THE RESEARCH

Research Design/Nature of Data/Population of the Study

The study adopted a survey research design; which necessitated the use of primary data. This study focused on the entire Nigerian manufacturing industry. However, the study frame covers only manufacturing companies that are members of Manufacturers Association of Nigeria (MAN) in the North–West region of Nigeria. The North–West region of Nigeria comprises of seven states: Jigawa, Kaduna, Kano, Katsina, Zamfara, Kebbi and Sokoto.

The population of this study is made up of the entire member of Manufacturers Association of Nigerian (MAN) in North – West Nigeria as at August, 2017. According to MAN (2018), the total number of companies that registered with them as members in the north-west states is 206.

Sample Size and Sampling Technique

The sample size was determined using Rakesh (2013) formula for estimating sample size:

$$SS = PS / [1 + (PS \times PE^2)]$$

Where:

SS = Sample size;

PS = Population size; and

P_E = Precision of error

Given the population of the study to be 206, the sample size for the study is 135. We selected companies across the various sectors using random sampling techniques.

Data Collection

Questionnaire and focus group discussion were used as instruments of data collection. Questionnaires were administered directly to the public relation officers of the selected companies by the researcher assistants and were filled by functional managers such as branch's customer care manger, head of productions/ operations, marketing manager, store manager, accounts and finance manager. While a focused group discussion was held with 5 selected top management staff i.e. the Directors and some middle managers of 50 manufacturing companies within the north-west region of Nigeria. All respondents were selected using random sampling technique.

Methods of Data Analysis

Descriptive statistics, correlation analysis and hierarchical regression analysis were used to analyze the data using SPSS 16.0 version.

RESULTS AND DISCUSSION

Descriptive Statistics

Table 1: Descriptive Statistics Results of External Factors and CE

	Mean	Std. Deviation	N
Corporate Entrepreneurship	4.6243	.74849	135
Market Dynamism	4.7654	1.01242	135
Environmental Hostility	4.3615	.84412	135
Socio Cultural Effects	4.8237	.90473	135
Political Regulatory Effects	4.7741	.83567	135

Source: Authors' Computation, 2018

Descriptive statistics Results (Means and Standard deviations) of external factors and CE are given in Table 1 above. The results shows that a moderate mean score is recorded for each of the items. As indicated, CE has a mean score of 4.6243. This item also recorded a standard deviation of 0.74849. Similarly, Market Dynamism, Environmental Hostility, Socio-Cultural Effects and Political Regulatory Effects recorded mean scores of 4.7654, 4.3615, 4.8237 and 4.7741 respectively. These items also recorded standard deviation values of 1.01242, 0.84412, 0.90473 and 0.82567 respectively.

Correlation Analysis

Using Pearson Correlation, the degree of association between external factors and CE were determined and the results are presented in the Table 2 below:

Table 2.: Relationship between External Factors and CE

		Correlation	Sig.
Pair 1	Market Dynamism& Corporate Entrepreneurship	.414	.000
Pair 2	Environmental Hostility& Corporate Entrepreneurship	.447	.000
Pair 3	Socio-Cultural Effects & Corporate Entrepreneurship	.584	.000
Pair 4	Political regulatory Effects & Corporate Entrepreneurship	.544	.000

Source: Authors' Computation, 2018

As presented in Table 2 above, there is a significant positive relationship between Market Dynamism and CE with zero-order correlation of 0.414. Environmental Hostility and Socio-Cultural Effects were also found to have significant positive relationship with CE with a correlation value of 0.447 and 0.584 respectively. Similarly, Political Regulatory Effects was also shown to have a significant positive relationship with CE with a correlation value of 0.544. The above correlations were all significant at 0.05 significant levels.

Hierarchical Regression Analysis

A Hierarchical Multiple Regression was performed to assess the external factors that influence Corporate Entrepreneurship in manufacturing companies in North-West Nigeria. The results of the model summary, ANOVA and coefficients on External Factors and Corporate Entrepreneurship (CE) are presented in the tables below:

Table 3: Result of Model Summary on External Factors and CE

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.414 ^a	.171	.165	.68399	.171	27.464	1	133	.000
2	.497 ^b	.247	.236	.65438	.076	13.308	1	132	.000
3	.627 ^c	.393	.379	.58963	.146	31.583	1	131	.000
4	.671 ^d	.451	.434	.56326	.057	13.550	1	130	.000

a. Predictors: (Constant), Market Dynamism

b. Predictors: (Constant), Market Dynamism, Environmental Hostility

c. Predictors: (Constant), Market Dynamism, Environmental Hostility, Socio Cultural Effects

d. Predictors: (Constant), Market Dynamism, Environmental Hostility, Socio Cultural Effects, Political Regulatory Effects
Source: Authors' Computation, 2018

The result in Table 3 above shows the contribution of each factor to the value of R^2 . It can be observed that all the factors each: Market Dynamism, Environmental Hostility, Socio-Cultural Effects and Political Regulatory Effects has significant contributions to the value of R^2 , as indicated by R^2 Change (.171, .076, .146 and .057 respectively). This indicates the proportion of dependent variable that can be explained by each independent variable. It shows that Market Dynamism explained the highest variation 17.1% of the proportion of dependent variable. The result reveals that overall, these factors in the external environment account for 45.1% variations in the Corporate Entrepreneurship in manufacturing industry in North-Western Nigeria. The low value of R^2 (45.1%) recorded is an indication that there are other factors in the external environment that also influence corporate entrepreneurship and were not captured in the CEAI.

The result as further indicated by the change statistics shows that for Market Dynamism, the value of F-change = 27.464 is being significant with p value of $0.00 < 0.05$, while for Environmental Hostility, F-change = 13.308 which is significant with p value = $0.00 < 0.05$, for Socio-Cultural Effects, the value of F-change = 31.583 also being significant, p value = $0.000 < 0.05$ and for Political Regulatory Effects, the value of F-change = 13.550 is significant with p value = $0.000 < 0.05$. This means that all the factors in the external environment have significant contribution to the overall relationship with the dependent variable (CE).

Table 4: Results of ANOVA^a on External Factors and CE

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	12.849	1	12.849	27.464	.000 ^b
	Residual	62.223	133	.468		
	Total	75.071	134			
2	Regression	18.547	2	9.273	21.656	.000 ^c
	Residual	56.524	132	.428		
	Total	75.071	134			
3	Regression	29.527	3	9.842	28.310	.000 ^d
	Residual	45.544	131	.348		
	Total	75.071	134			
4	Regression	33.826	4	8.457	26.655	.000 ^e
	Residual	41.245	130	.317		
	Total	75.071	134			

a. Dependent Variable: Corporate Entrepreneurship

b. Predictors: (Constant), Market Dynamism

c. Predictors: (Constant), Market Dynamism, Environmental Hostility

d. Predictors: (Constant), Market Dynamism, Environmental Hostility, Socio Cultural Effects

e. Predictors: (Constant), Market Dynamism, Environmental Hostility, Socio Cultural Effects, Political Regulatory Effects

Source: Authors' Computation, 2018

Table 4 above presents the result of ANOVA for each of the four hierarchies (model). It shows that each of the four models have significant relationship with the dependent variable. For the first model with one predictor, $F(1, 133) = 27.464$, with p value of $0.00 < 0.05$ which indicate significant relationship between Market Dynamism and CE. Similarly, for the second model with two predictors, $F(2, 132) = 21.656$, p value = 0.00 which is < 0.05 . This indicates that both Market Dynamism and Environmental Hostility have significant relationship with CE. Adding the third predictor, the result shows significant relationship with the dependent variable, $F(3, 131) = 28.310$ with p value of $0.000 < 0.05$. Furthermore, at the fourth hierarchy, the result shows significant relationship between the independent variables and the dependent variable with $F(4, 130) = 26.655$ and p value of $0.000 < 0.05$.

Table 5: Results of Coefficients^a on Internal Factors and CE

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.167	.284		11.140	.000
	Market Dynamism	.306	.058	.414	5.241	.000
2	(Constant)	2.502	.327		7.639	.000
	Market Dynamism	.186	.065	.252	2.873	.005
	Environmental Hostility	.283	.078	.320	3.648	.000
3	(Constant)	1.715	.327		5.251	.000
	Market Dynamism	.133	.059	.180	2.255	.026
	Environmental Hostility	.107	.077	.120	1.390	.167
	Socio Cultural Effects	.375	.067	.453	5.620	.000
4	(Constant)	1.232	.338		3.642	.000
	Market Dynamism	.096	.057	.130	1.679	.096
	Environmental Hostility	.069	.074	.078	.938	.350
	Socio Cultural Effects	.291	.068	.352	4.297	.000
	Political Regulatory Effects	.257	.070	.287	3.681	.000

a. Dependent Variable: Corporate Entrepreneurship

Source: Authors' Computation, 2018

From the Table 5 above, Market Dynamism was the first variable entered, followed by Environmental Hostility, Socio-Cultural Effects and Political Regulatory Effects. The results show that for the first predictor, beta coefficient is positive and significant; $\beta = .414$, $t = 11.140$ and $p \text{ value} = 0.000 < 0.05$. This means that Market Dynamism has significant effect on CE. Beta coefficient for the second predictor, Environmental Hostility is also positive and significant; $\beta = 0.320$, $t = 3.648$, and $p \text{ value} = 0.000 < 0.05$. In essence, Environmental Hostility has significant effect on CE. Similarly, beta value for the third predictor, Socio-Cultural Effects is positive and significant; $\beta = .453$, $t = 5.620$, and $p \text{ value} = 0.000$ which is less than 0.05. This implies that Socio-Cultural Effects has significant effect on CE. Furthermore, beta coefficient for the fourth predictor is positive and significant; it has standardized coefficient value of 0.287, $t \text{ value}$ of 3.681 and $p \text{ value}$ of 0.00 which is less than 0.05. This also means that Political Regulatory Effects has significant effect on CE. On the strength of relationship, Socio-Cultural Effects showed the strongest statistical relationship with CE. Followed by Market Dynamism, Environmental Hostility and Political Regulatory Effects.

Discussion of Findings

From the data elicited from the findings of this study, it was reported that the four factors (Market Dynamism, Environmental Hostility, Socio-Cultural Effect and Political Regulatory Effect) have significant effect on CE. This findings support the findings of many authors including Nihal and Ata (2014) and Sheepers (2007). In line with the findings of present research, Scheepers (2007) reported that dynamism was found to have the strongest influence on corporate entrepreneurial intensity in some South African firms, while hostility was not found to have significant effect on corporate entrepreneurial intensity. On the contrary, Nihal and Ata (2014) reported that dynamism had no significant effect on the pro-active dimension CE.

Furthermore, Nigerian government lacks continuity especially in terms of policies. Once a government is changed, the new government tends to change most of the policies especially those that concern importations. This may be the reason why manufacturing companies perceive intense competitive rivalry with foreign companies and explained why hostility was found to have significant effect on CE.

Key contribution of this findings lie on the fact that compared to previous study, it observed the effect socio-cultural and legal/ political factors would have on CE. Implications of this finding to research is that any model predicting CE with factors in the external environment have to capture the socio-cultural and legal variables of that particular environment. This is important owing to the fact that socio-cultural factors account for differences in environment. For instance, Nigerians have poor attitude toward any goods that is written 'made in Nigeria'. This has affected Manufacturing companies in Nigeria to the extent that some of them have to write 'made in China or Made in England' on their product before their products can compete favourable, while some countries may attach higher value to their locally made products than foreign ones. And to manufacturing companies in Nigeria, since all the four significant variables in the model showed positive effect on CE, it can be used in predicting CE.

CONCLUSION AND RECOMMENDATIONS

The study concludes that CE in manufacturing companies in the North-West of Nigeria are affected by external factors and the social life styles and culture of Nigerians influence CE, and political and legal structure equally

influence CE in Nigerian business environment. Since smuggling and negative attitude toward made in Nigeria product are part of the socio – cultural factors identified as having effect on CE. The study therefore recommends that the Nigerian government should intensify efforts in check mating the activities of the smugglers. This can be done by making existing laws on this matter more effective. They should also assist the manufacturing companies in the campaign for attitudinal change toward made in Nigerian products. This can be done through the enactment of laws that will favour locally made products. For example, the automobile policy of the immediate past administration can be re-enforced and extended to other sectors of manufacturing industry in Nigeria.

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EXPLORING THE SPECIFIC INTERNAL FACTORS THAT INFLUENCE CORPORATE ENTREPRENEURSHIP IN MANUFACTURING COMPANIES IN NORTH – WESTERN NIGERIA

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Abstract:

The competitiveness of the business environment today is such that requires Corporate Entrepreneurship (CE) that involves Work Autonomy, Organisational Boundary, a favorable Reward System, Management Support and Time Availability for organizational survival. However, in spite of the numerous perceived importance of this new approach, business organizations have not availed themselves of this mechanism for growth. Therefore, this study was designed to explore the specific internal factors that influences CE in manufacturing companies in North-West Nigeria. The study used primary data which were collected from Nigerian manufacturing companies in the North-West Nigeria. Correlation and Hierarchical Regression analysis was used to analyse the data through a structured questionnaire. Descriptive statistics and hierarchical regression analysis were used to analyze the data. Findings show that Work Autonomy, Organisational Boundary, Reward System and Management Support have significant positive influence on CE as shown by $\beta = 0.313, 0.637, 0.293, 0.519$. However, Time Availability was not found to have significant positive effect on CE at 5% level of significance. The study therefore, concluded that manufacturing companies in the North-West of Nigeria have a favourable internal environment that can facilitate corporate entrepreneurship activities and among all the internal factors that influence corporate entrepreneurship, Organisational Boundary accounted for more variations. The study recommended that respective management of every business organizations should develop a means of continuous improvement upon these factors especially organizational boundary, Management Support, Work Autonomy and Reward System.

Keywords: Autonomy; Boundary; Reward; Support; Time; Organization

INTRODUCTION

Background to the Study

Corporate Entrepreneurship (CE) can be seen as a paradigm shift in organizational decision making process; because it permits a bottom – top approach of harvesting ideas and innovations that can engender corporate goals achievements as opposed to the traditional approach. The usual practice allows the top echelon of the organization to take decisions on issues relating to continuous existence of the organization, but the 21st century approach is to harvest the views of the organizational members for the purpose of pulling together innovative ideas with the hope of organizational efficiency. Organizations' interest in CE arises as a result of the dynamic nature of the business environment couple with the effect of globalization. Notable among several factor responsible for dynamism of business environment include: change in the market, change in consumers' taste, competition and technological changes (Scheepers, 2007; Olughor, 2014).

The only way to cope with these challenges of environmental uncertainties according to existing literatures (Kuratko, 2009; Kuratko, Hornsby & Covin, 2014) is for the organizations to keep on improving on their

products or services and introducing new ones i.e.constant innovations which can be achieved through Corporate Entrepreneurship. CE is recognized to have much importance which is not limited to business organizations only. It also has the potentials to contribute greatly to the overall economy of a nation by making different varieties of goods and services available for both domestic consumption and export purpose and creating job opportunities (Sathe, 2003).

However, for CE to flourish in any organization there must be a favourable internal environment and in this situation, the upper management must be willing to support the employees and encourage them to come up with new ideas. In addition, this requires giving the employees adequate time in order to come up with new ideas and employees must be given enough freedom to take decisions with respect to their work. Furthermore, there must be a good reward system that will motivate the employees to have interest in CE, and management should be willing to remove all the bureaucratic processes in the organization (see Hornsby, Kuratko & Zahra, 2002).

Statement of the Problem

Nigeria, despite the claim as the fastest growing and largest economy in Africa has become like a dumping ground where even the scraps used in the advanced countries (popularly called „Tokumbo“ in local language) are brought to – used cars, used car parts, used textile materials, foot wears etc. Worst is that even the Nigerians themselves by attitude always prefer to buy imported (used or new) materials with believe that they are of higher quality than the ones produced locally, thus leading to over domination of local market by foreign products. This, in addition to many other factors such as global competition, constant technological changes, harsh operating and legal environment etc. (Olughor, 2014) have posed serious threats on the competitiveness of manufacturing industry in Nigeria which has led to its poor performance and collapsed of many firms.

The Nigerian Bureau of Statistic (NBS) (2014) in a recent report confirmed that the share of contribution of Nigerian manufacturing sector of the overall economic output has drastically declined since it recorded a peak of 7.83% in 1982. NBS (2014) attributed several factors, many of which portrayed both the vulnerability of the sector to the global economic pressures such as global economic meltdown witnessed in 2008, the current fluctuation of exchange rate (NBS, 2015) and the effects of policy changes such as Structural Adjustment Programme (Nyor&Chinge, 2014) in reshaping the sector as reasons for the variation in manufacturing sector share over time. Thus, to prevent further decay of this sector, a new way of fostering competitiveness through constant innovations becomes desirable. However, CE as earlier stated is said to be a process driven by many forces one of which is the internal environment. Therefore, a deep investigation into these factor or antecedent to CE identified by the literature is required.

First, considering Nigerian internal business environment, most business organizations operate a management style which most employees perceived indifferently (Olughor, 2014). Most employers do not regard labour laws and ethics, thus giving room for unfair practices by the employers (Ugwudioha, 2004). Oke and Dawson (2008) describe Nigerian work environment as impersonal and task oriented, which uses close supervision and operates within a strict disciplinary code; thus, there is no or little autonomy among the employees. This management system represents Nigerian post-colonial heritage, in which there is no room for employees’ initiative. Oke and Dawson (2008, p. 9) further describe such system as risk averse, centralised, hierarchical, non-consultative and authoritarian.

Furthermore, in terms of reward, the reward system in most private organizations in Nigeria is not encouraging, because till today, some employers pay their employees as low as \$75 (N30, 825) a month or even less than that in some cases. Most employers hide under the depressed economic condition of the country and claim they are not breaking even, thereby giving just little amount to their employees as salary. What added to this problem is that either there is no law regulating private sector wage in Nigeria, or the law is not functioning. Another problem regarding reward system in Nigeria is the issue of wage disparity between a foreign expatriate and Nigeria staff. Ugwudioha (2004) claims that foreign expatriate with the same qualification with Nigerian staff receives 12 times more in most cases than Nigerian expatriate. Therefore, the internal environmental conditions in Nigeria business environment have created serious doubt as to whether or not the theory of CE is applicable in manufacturing industry in Nigeria. Giving this scenario, it is difficult to ascertain the nature and dimensions of CE activities in this sector – whether the internal factors are favourable to CE in manufacturing companies or not. This signifies a knowledge vacuum, and the filling of this vacuum formed the basic problem that this research was designed to address.

Furthermore, in terms of research, CE in Nigeria has received little attention despite the importance attached to it by both the organizations and the academics across the globe. Till date, there is no much evidence of empirical research on the specific internal factors that influence CE in Nigeria except the recent work of Olughor (2014).

Therefore, there is a need to carry out a comprehensive study on CE putting into consideration the factors in the internal environment.

Research Objectives

The goal of this research is in line with the agenda of the Federal Government of Nigeria to diversify economy from oil sector to other sectors, which manufacturing industry presents an alternative means. Therefore, the broad objective of this research is to explore the specific internal factors that influence CE in manufacturing companies in North-Western Nigeria. However, specific objectives include to:

- i. determine whether work autonomy influences CE in manufacturing companies in North-Western Nigeria;
- ii. assess the influence of organizational boundary on CE in manufacturing companies in North-Western Nigeria;
- iii. examine whether reward system influences CE in manufacturing companies in North-Western Nigeria;
- iv. determine the effect of management support on CE in manufacturing companies in North-Western Nigeria; and
- v. assess the influence of time availability on CE in manufacturing companies in North-Western Nigeria.

REVIEW OF LITERATURE

Internal Factors that Determine CE

Over the years, research has sought to identify the internal factors that can either impede or foster entrepreneurial spirit among the employees in an established organization. The earlier work of (Zahra; Sathe; Kanter; Covin & Slavin, cited in Kuratko, Hornsby & Bishop, 2005) and the recent studies of (Hornsby et al., 2002; Sathe, 2003; Adonisi, 2003; Chaka, 2006; Davis, 2006; Scheepers, 2007) have contributed very significantly to literature on these internal factors.

Research effort by Kuratko, Montagno, and Hornsby (1990) identified three factors as internal factors capable of nurturing innovation in organizations. These factors include: top management support, organizational structure, and rewards to be the most important antecedents of managers' entrepreneurial behaviour (Hornsby, Holt, & Kuratko, 2008). A latter study carried out by these scholars Kuratko, Montagno, and Hornsby (1999) as an extension of their initial work found two additional factors namely: Time Availability/autonomy and resource availability as important determinants of entrepreneurial behaviour within organization (Hornsby et al., 2008). According to Kuratko and Hodgetts in Marguerite (2003), these factors form the basis to ascertain whether or not an organization has a favourable internal environment that fosters internal entrepreneurship. Detailed discussion of each of these factors is presented below:

Organizational Boundary

Existing literature (Hornsby et al., 2002) has pointed to the structural boundaries as a major stumbling block for lower and middle management in corporate entrepreneurial activity. Lack of hierarchy according to Marguerite (2003) is central to the development of corporate entrepreneurship. This author contends that organisational hierarchies create the need for employees to ask for permission, meaning the steeper the hierarchy; the harder it is for employees to get permission for innovative behaviours. In other words, if employees may have to seek for permission from a higher authority, they may be discouraged to take steps towards initiating new things. Furthermore, the person in the higher authority is likely to frustrate the efforts of the subordinate by not granting the approval since the idea is not coming from him/her.

Williams (2007) argues that for organizations to foster creativity, they will have to remove some hindrances to creativity from their work environment. The author maintains that issues such as internal conflict and power struggles and rigid management structures can all discourage creativity. Scheepers, Hough and Bloom (2008) support this argument by stating that a bureaucratic organisational structure leads to perceived boundaries, which can create obstacles to CE activities.

Reward

Many authors (see for example Fry, 1993) concur that reward is an instrument that can develop the motivation of individuals to engage in innovative, proactive and moderate risk-taking behaviour. The use of appropriate rewards can also develop managers' inclination to get involved with uncertain, risky entrepreneurial projects. Reward according to Hornsby et al. (2008) requires developing and using systems that reward performance, highlight significant achievements, and encourage pursuit of challenging work. Corporate entrepreneurs, like independent entrepreneurs take risks in initiating change and they are expected to be rewarded for their efforts (Wehrich & Koontz, 2005).

The issue of relative value of intrinsic and extrinsic rewards from the perspective of encouraging entrepreneurial behaviours has generated a lot of arguments among the scholars (Lotz & Merwe, 2013). Marguerite (2003) contends that reward for corporate entrepreneurs should not be in form of increment in salary and promotions which are traditional methods of rewarding managers, as this will remove them (corporate entrepreneurs) from the area in which they are innovative. In the same vein, Fry (1993) suggests that reward system for corporate entrepreneurs should be both monetary and non-monetary. Corporate entrepreneurs, in terms of monetary reward reap fewer financial benefits of their entrepreneurial engagement, because they take few personal risks, and the organization provides a considerable amount of security in case of failure (Bosma, Wennekers, Guerrero, Amorós, Martiarena & Singer, 2013)

In terms of non-monetary, Lotz and Merwe (2013) suggest that recognition rewards such as status, challenging work and autonomy could be offered as reward for a corporate entrepreneur. While, extended leave, promotions and creating facilities for child care and recreation is recommended for corporate entrepreneurs in health sector (Letsie, 2013). However, for any reward system that encourages entrepreneurial activity to be effective, it should consider goals, feedback, emphasis on individual responsibility, and result-based incentives (Hornsby et al., 2002). Recent research argues that reinforcement is individual specific, because what may re-enforce one person may not work for another person or might not have the same impact on others (Kong, 2012).

Management Support

One of the reasons why one finds very few entrepreneurs in large organizations according to Marguerite (2003) is linked to the fact that most large organizations often do not encourage entrepreneurial behaviour, which results in corporate entrepreneurs being seen as cynics. Management Support entails „the willingness of top-level managers to facilitate and promote entrepreneurial behaviour, including the championing of innovative ideas and providing the resources people require to take entrepreneurial actions“ (Hornsby et al., 2008). Management must create an environment for effective and efficient achievement of group goals and promote opportunities for corporate entrepreneurs to utilize their maximum potentials for creativity and innovation (Wehrich & Koontz, 2005).

Stokes, Wilson and Mador (2010) posit that top management support is a vital element without which a corporate entrepreneurial environment cannot succeed. Management Support can assume different dimensions (Adonisi, 2003). These dimensions include provision of necessary resources and expertise, ideas championing, quick in implementing ideas by employees, give acknowledgment to employees who generate ideas, support for new projects, and provide funds to commence the projects.

Corporate leadership plays an important role in creating a supportive CE environment (Stoke et al., 2010; Adonisi, 2003). According to Stokes et al. (2010) corporate entrepreneurs require leaders that will encourage and foster them. Similarly, Mokoya (2012) argues that for corporate entrepreneurship to flourish in an organization, the leadership should be willing to listen to and recognize good ideas whenever and from whom they arise.

In the same vein, recent studies (Lassen, 2007; Adonisi, 2003) have linked this important role of leadership in CE to strategic management. This connection between entrepreneurship and strategic management has introduced a new concept called „strategic entrepreneurship“ (Lassen, 2007) or strategic leadership (Adonisi, 2003). Ferreira (2002) further argues that top management actions and responses in relation to the autonomous strategic behaviour of middle managers may significantly influence the frequency and success of entrepreneurial effort in the firm.

Work Discretion

Work Discretion or autonomy is the extent to which employees are allowed to make decisions about how to perform their own jobs in the way and manner they feel is the most effective (Baba & Ahmid, 2011). For example, tolerance for failure, own decision making, delegation of authority from top management to middle management, freedom from excessive oversight can spur trials for new things among employees (Charlotte, 2008). Taking a reasonable risk at times will result in failure. But since corporate entrepreneurs take this risk on behalf of their organizations, failure must be tolerated. Thus, corporate entrepreneurs must be given some degree of freedom to pursue their ideas which requires that sufficient authority be delegated (Wehrich & Koontz, 2005).

Work Discretion also referred to as work autonomy or intrapreneurial freedom, involves permitting employees to make decisions about performing their own work in the way they believe is the best and most effective, and allowing them to use their initiative. Autonomy extends to decentralization of decision making power from the top to those that will actually perform the tasks (Alkpan, Bulut, Gunday, Ulusoy, Kilic, 2008). Any organization

that seeks to promote CE will create managerial supports that will encourage or motivate employees to take part in identifying new opportunities by giving the employees autonomy over their work.

However, recent researches building on the initial work of Kuratko et al. (1990), Hornsby et al. (1999) and Hornsby et al. (2002) have expanded the knowledge of internal factors of CE. As a result, different organizational dimensions have been used by different researches to measure these factors. For example, Armesh et al. (2013) in their study titled „Impact of organizations condition on corporate entrepreneurship and performance“ used variables such organizational conditions, organizational communication, formal control, environmental scanning, values, management supports and work independence to measure internal organizational factors of CE.

Time Availability

There is need for entrepreneurial thinking organizations to moderate work load, take away obstacles and constraints on employees“ work in order to facilitate conducts that can lead to experimentation and risk-taking behaviours (Chen & Cangahuala, 2010). Corporate organizations have to ensure individual employees and groups have the necessary time needed to pursue innovations (Charlotte, 2008), thus, to achieve this objective, they have to structure jobs to support efforts to achieve all the goals of the organization. Many literatures (see for example Hornsby et al., 2008; Scheepers, 2007) suggest that enterprises should support CE initiatives by not only making resources available, but also allowing employees“ time to develop new ideas. In the same vein, Chaka (2006) argues that employees must be given time to encourage experimentation and risk taking. Scheepers et al. (2008) maintain that for new and innovative ideas to thrive, employees need to be given time to incubate their ideas. These authors suggest that organisations should be reasonable in assigning the workload to their employees and allow them to work with others on solving long-term problems.

Furthermore, Davis (2007) gave an insight into characteristics of internal organizational factors to include organizational culture, organizational structure and managerial support systems. Tidd, Bassant, and Pavitt (2001) further identify leadership as a factor in building CE in an organization. The authors argue that commitment from the top management is important for CE to succeed in an organization. Thus, it is important to note that there is lack of agreement generally on the specific dimensions on which to measure internal factors that determine CE. Therefore, present study tends to adopt the initial five factors identified by Hornsby et al. (2002).

Relationship between Internal Factors and CE

Existing literatures have argued that positive relationships exist between internal factors and CE (see for example, the work of Radmard, Ardakani & Rahro, 2013). Sebora and Theerapatvong (2009) posit that internal factors, particularly management support for the individual entrepreneurship of its managers are the most consistently associated with idea generation, risk taking, and pro-activeness. Consistent with the position of Sebora and Theerapatvong (2009), Antoncic and Hisrich, (2000) argue that management and organizational support is the most important among all examined internal factors; because it tends to have the strongest influence on corporate entrepreneurship. Support by the top management has been found in many researches to have a direct positive relationship with organization“s entrepreneurship (Kuratko, et al., 2014; La Nafie et al., 2014; Chen et al., 2005).

Similarly, existing researches have shown that there exist positive significant relationship between organizational boundary and innovativeness dimension of CE (Hough & Scheepers, 2008; Chen & Cangahuala, 2010). According to La Nafie et al. (2014), when organizations let lose restrictions, rules and authorities, employees are encouraged to participate in innovative activities. In the same vein, Kuratko et al. (2014) posit that supportive organizational structure can make productive use of entrepreneurial enabling resources.

Furthermore, many authors (Fry, 1987; Kanter, 1985; Gunu & Tsado, 2015) concur that rewards and reinforcement is an instrument that can develop the motivation of individuals to engage in innovative, proactive and moderate risk-taking behaviour. The use of appropriate rewards can also develop managers“ inclination to get involved with uncertain, risky entrepreneurial projects. Despite the fact that reward may encourage entrepreneurial risk taking, it may also nevertheless discourage such behaviours that have no connections with specific reward (see Adonisi, 2003). Therefore, Adonosi (2003) argues that reward can have a significant effect on corporate entrepreneurial activities as both a tool to increasing such activities, and a tool to discouraging innovative behaviours by rewarding other behaviours.

Theoretically, Time Availability or work freedom is expected to have significant positive relationship with CE. This relationship was empirically examined and confirmed by many scholars including Rutherford and Holt (2007); Scheepers (2007). Innovative opportunities are often best identified by employees with freedom over how to carry out their duty (Kuratko et al. (2014). Similarly, it is believed that work load schedules will ensure extra time for employees to pursue innovative activities (Kuratko, et al., 2014). New and innovative ideas will

Flow if employees have required time for creative thinking. Having extra time among employees is a key resource for generating innovative ideas (Kuratko, et al., 2014). On a wider perspective, Turró (2012) argues that internal factors are the first set of factors that influence corporate entrepreneurship intensity. The reason may be that because they are within the control of the organization and have direct impact on the activities of the organization (Kuratko, 2009).

Theoretical Framework

This study is built on the foundation of three theories, which are the Technology-Organization-Environment (TOE) Framework, Diffusion of Innovation Theory and Job Characteristics Theory. These three theories were found to be relevant to some dimensions of the present study. TOE was developed by Tornatzky and Fleischer in 1990 (Awa, Ukoha & Emecheta, 2012; Oliveira & Martins, 2011). TOE framework was developed to elucidate organizational components that determine the adoption of decisions regarding innovations in a firm (Arpaci, Yardimci, Ozkan & Turetken, 2012; Lippert & Govindarajulu, 2006) and the theory is based on three variables: technology, environment and organization context.

Diffusion of Innovation Theory is similar to TOE. DOI developed by Everett Rogers relates to how, why and at what rate new ideas and technology are passed through cultures, operating at individual and firm level (Oliveira & Martins, 2011). According to Rogers (1995) innovations are being communicated through certain channels over time within an organization which relates to individual or leader characteristics, internal characteristics of organizational structure and external characteristics of the organization.

Job Characteristics Theory propounded by Hackman and Oldham (Moorhead & Griffin, 2007) describes the relationship between job characteristics and performance or response of individual to work. The theory explains the specific job conditions under which individuals are likely to put in their best in their respective work. Job Characteristics Theory is based on five job dimensions. These include skill variety, task identity, task significance, autonomy and feedback. However, the major concern of the present study regarding the three theories discussed above is the organizational context of TOE and DOI, i.e. management support for innovation, degree of centralization, which defines organizational boundary and organizational slack. While in job characteristics model, present study is concerned with the autonomy – i.e. the extent to which manufacturing companies in Nigeria give substantial freedom to their employees.

Review of Empirical Findings

Since the development of Corporate Entrepreneurship Assessment Instrument (CEAI), many scholars have empirically applied it in different environment and have come up with different findings (see Kuratko, et al., 2014). Few among many other scholars that examined factors in the internal environment and CE using CEAI include: La Nafie, Nimran, Musadieq and Suyadi (2014); Olughor (2014); Chen and Cangahuala (2010); Hornsby, Kuratko, Shepherd, and Bott (2009) and Hornsby et al. (2008).

La Nafie et al. (2014) in their study reported that management support; reward system and Time Availability each has positive significant effect on CE, while organizational structure and resource availability each does not have significant effect on CE. However, La Nafie et al. (2014) focused on selected Banks in Indonesia which are service providing organizations. CE may be more important in any organization that requires use of technical skills such as production, designing etc. Olughor (2014) carried out a study on corporate entrepreneurship and employee retention strategies in Nigerian telecommunication industry used multiple regression analysis for the data analysis. His result shows a low value of $R^2 = 29.3\%$. The author reported that except time availability, other factors in the internal environment: management support, Time Availability, reward/ re-enforcement and organizational boundary each had a significant effect on CE with t values = -4.044, -3.141, 2.511 and 8.074 and sig values = 0.000, 0.002, 0.012 and 0.000 respectively. Just like La Nafie et al. (2014), Olughor (2014) focussed on telecommunication companies which are also service providing organizations.

Chen and Cangahuala (2010) in their study focusing on manufacturing sector in Taiwan reported that management support, Time Availability and reward each has significant relationship with each of the three dimensions of CE (innovativeness, pro-activeness and risk-taking), while organizational boundary has significant relationship with innovativeness and pro-activeness, time availability on the other hand has significant relationship only with risk-taking. Similarly, Hornsby et al. (2009) found a low significant relationship between new idea implemented and top management support ($r = 0.19$), Time Availability ($r = 0.11$) and reward/reinforcement ($r = 0.15$), only time availability has negative relationship with new ideas implemented and is not significant ($r = -0.02$).

Furthermore, Scheepers (2007) reported that only internal factors (management support ($r = 0.43$), autonomy ($r = 0.31$) and reward ($r = 0.31$)) each has significant relationship with corporate entrepreneurial intensity among e-business firms in South Africa. In Kuratko et al. (2008) it was reported that support by the management has the strongest relationship with entrepreneurial orientation ($r = 0.45$). However, entrepreneurial orientation has moderate positive significant relationship with Time Availability ($r = 0.17$), time availability ($r = 0.13$) and rewards/reinforcement ($r = 0.15$). Kuratko et al. (2008) failed to include organizational boundary in their study.

METHODOLOGY OF THE RESEARCH

Research Design/Nature of Data/Population of the Study

This study adopted a survey research design; which necessitated the use of primary data. However, the study frame covers only manufacturing companies that are members of Manufacturers Association of Nigeria (MAN) in the North–West region of Nigeria. The North–West region of Nigeria comprises of seven states: Jigawa, Kaduna, Kano, Katsina, Zamfara, Kebbi and Sokoto.

The population of this study is made up of the entire member of Manufacturers Association of Nigerian (MAN) in North – West Nigeria as at August, 2017. According to MAN (2018), the total number of companies that registered with them as members in the north-west states is 206.

Sample Size and Sampling Technique

The sample size was determined using Rakesh (2013) formula for estimating sample size:

$$SS = PS / [1 + (PS \times P_E^2)]$$

Where: SS = Sample size;

PS = Population size; and

P_E = Precision of error

Given the population of the study to be 206, the sample size for the study is 135. We shall select companies across the various sectors using random sampling techniques.

Data Collection

Questionnaire and focus group discussion were used as instruments of data collection. Questionnaires were administered directly to the public relation officers of the selected companies by the researcher assistants and were filled by functional managers such as branch's customer care manger, head of productions/ operations, marketing manager, store manager, accounts and finance manager. While focused group discussion was held with 5 selected top management staff i.e. the Directors and some middle managers of 50 manufacturing companies within the north-west region of Nigeria. All respondents were selected using random sampling technique.

Methods of Data Analysis

Descriptive statistics, correlation analysis and hierarchical regression analysis were used to analyze the data using SPSS 16.0 version.

RESULTS AND DISCUSSION

Descriptive Statistics

Table 1: Descriptive Statistics Results of Internal Factors and CE

	Mean	Std. Deviation	N
Corporate Entrepreneurship	4.6243	.74849	135
Work Autonomy	4.3963	.72958	135
Organisational Boundary	4.8741	.82041	135
Reward System	4.9210	.94563	135
Management Support	4.5762	.70211	135
Time Availability	4.8067	.81956	135

Source: Authors' Computation, 2018

Descriptive statistics Results (Means and Standard deviations) of internal factors and CE are presented in Table 1 above. Analysis of the results illustrates that a moderate mean score is recorded for each of the items. As indicated, Corporate Entrepreneurship has a mean score of 4.6243. This item also recorded a standard deviation of 0.74849. Similarly, Work Autonomy, Organisational Boundary, Reward System, Management Support and

Time Availability recorded mean scores of 4.3963, 4.8741, 4.9210, 4.5762 and 4.8067 respectively. These items also recorded standard deviation values of 0.72958, 0.82041, 0.94563, 0.70211 and 0.81956 respectively.

Correlation Analysis

The degree of relationship between internal factors and Corporate Entrepreneurship were determined using Pearson Correlation and the results are presented in the Table 2 below:

Table 2: Correlation Relationship between Internal Factors and CE

		Correlation	Sig.
Pair 1	Work Autonomy & Corporate Entrepreneurship	.313	.000
Pair 2	Organisational Boundary & Corporate Entrepreneurship	.652	.000
Pair 3	Reward System & Corporate Entrepreneurship	.620	.000
Pair 4	Management Support & Corporate Entrepreneurship	.732	.000
Pair 5	Time Availability & Corporate Entrepreneurship	.369	.000

Source: Authors' Computation, 2018

As presented in Table 2 above, there is a significant positive relationship between Work Autonomy and CE with zero-order correlation of 0.313. Organisational Boundary and Reward System were also found to have significant positive relationship with CE with a correlation value of 0.652 and 0.620 respectively. Similarly, Management Support and Time Availability were also shown to have a significant positive relationship with CE with a correlation value of 0.732 and 0.369 respectively.

Hierarchical Regression Analysis

A Hierarchical Multiple Regression was performed to determine the specific internal factors that influence Corporate Entrepreneurship in manufacturing companies in North-West Nigeria. The results of the model summary, ANOVA and coefficients on Internal Factors and Corporate Entrepreneurship (CE) are presented in the tables below:

Table 3: Result of Model Summary on Internal Factors and CE

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.313 ^a	.098	.091	.71357	.098	14.434	1	133	.000
2	.653 ^b	.427	.418	.57108	.329	75.648	1	132	.000
3	.680 ^c	.462	.450	.55502	.036	8.753	1	131	.004
4	.782 ^d	.611	.599	.47389	.149	49.691	1	130	.000
5	.784 ^e	.615	.600	.47352	.004	1.204	1	129	.275

a. Predictors: (Constant), Work Autonomy

b. Predictors: (Constant), Work Autonomy, Organisational Boundary

c. Predictors: (Constant), Work Autonomy, Organisational Boundary, Reward System

d. Predictors: (Constant), Work Autonomy, Organisational Boundary, Reward System, Management Support

e. Predictors: (Constant), Work Autonomy, Organisational Boundary, Reward System, Management Support, Time Availability.

Source: Authors' Computation, 2018

The result in Table 3 above shows the contribution of each factor to the value of R^2 . It can be observed that all the factors each: Work Autonomy, Organizational Boundary, Reward System and Management Support has significant contributions to the value of R^2 except for Time Availability, as indicated by R^2 Change (.098, .329, .036, .149 and .004 respectively). This indicates the proportion of dependent variable that can be explained by each independent variable. It shows that organizational boundary explained the highest variation 32.9% of the proportion of dependent variable. The result reveals that overall, these factors in the internal environment account for 61.5% variations in the Corporate Entrepreneurship in manufacturing industry in North-Western Nigeria. The value of R^2 (61.5%) recorded is an indication that there are other factors in the internal environment that also influence corporate entrepreneurship and were not captured in the CEAI. Olughor, (2014) in a similar study in Nigeria used CEAI and recorded a low value of $R^2 = 29.3\%$. Similarly, Sheepers, (2007) in a study conducted in South African reported R^2 value of 10%. The result reveals that organizational boundary explains more variation in CE than every other factors; it has R^2 of 18%.

The result as further indicated by the change statistics shows that for Work Autonomy, the value of F – change = 14.434 is being significant with p value of $0.00 < 0.05$, while for Organisational Boundary, F -change = 75.648 which is significant with p value = $0.00 < 0.05$, for Reward System, the value of F -change = 8.753 also being significant, p value = $0.004 < 0.05$, the result shows that for Management Support, the value of F – change = 49.691 is significant, p value = $0.000 < 0.05$.and for Time Availability, the value of F -change = 1.204 is not significant with p value = $0.275 > 0.05$. This means that all the factors in the internal environment have significant contribution to the overall relationship with the dependent variable (CE) except for Time Availability.

Table 4: Results of ANOVA^a on Internal Factors and CE

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	7.349	1	7.349	14.434	.000 ^b
	Residual	67.722	133	.509		
	Total	75.071	134			
2	Regression	32.021	2	16.011	49.092	.000 ^c
	Residual	43.050	132	.326		
	Total	75.071	134			
3	Regression	34.717	3	11.572	37.568	.000 ^d
	Residual	40.354	131	.308		
	Total	75.071	134			
4	Regression	45.877	4	11.469	51.071	.000 ^e
	Residual	29.194	130	.225		
	Total	75.071	134			
5	Regression	46.146	5	9.229	41.162	.000 ^f
	Residual	28.925	129	.224		
	Total	75.071	134			

a. Dependent Variable: Corporate Entrepreneurship

b. Predictors: (Constant), Work Autonomy

c. Predictors: (Constant), Work Autonomy, Organisational Boundary

d. Predictors: (Constant), Work Autonomy, Organisational Boundary, Reward System

e. Predictors: (Constant), Work Autonomy, Organisational Boundary, Reward System, Management Support

f. Predictors: (Constant), Work Autonomy, Organisational Boundary, Reward System, Management Support, Time Availability.

Source: Authors' Computation, 2018

Table 4above presents the result of ANOVA for each of the five hierarchies (model). It shows that each of the five models have significant relationship with the dependent variable. For the first model with one predictor, $F(1, 133) = 14.434$, with p value of $0.00 < 0.05$ which indicate significant relationship between Work Autonomy and CE. Similarly, for the second model with two predictors, $F(2, 132) = 16.011$, p value = 0.00 which is < 0.05 . This indicates that both Work Autonomy and Organizational Boundary have significant relationship with CE. Adding the third predictor, the result shows significant relationship with the dependent variable, $F(3, 131) = 11.572$ with p value of $0.000 < 0.05$. For the fourth model with four predictors, the result indicates significant relationship with CE, $F(4, 130) = 11.469$, and p value of $0.00 < 0.05$. Furthermore, at the fifth hierarchy, the result shows significant relationship between the independent variables and the dependent variable with $F(5, 129) = 9.229$ and p value of $0.000 < 0.05$.

Table 5: Results of Coefficients^a on Internal Factors and CE

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.213	.376		8.534	.000
	Work Autonomy	.321	.084	.313	3.799	.000
2	(Constant)	1.633	.352		4.641	.000
	Work Autonomy	.036	.075	.035	.481	.631
	Organisational Boundary	.581	.067	.637	8.698	.000
3	(Constant)	1.554	.343		4.530	.000
	Work Autonomy	.006	.074	.006	.085	.932
	Organisational Boundary	.390	.092	.428	4.259	.000
	Reward System	.232	.078	.293	2.959	.004
4	(Constant)	.706	.317		2.231	.027
	Work Autonomy	-.066	.064	-.064	-1.031	.305
	Organisational Boundary	.256	.080	.281	3.185	.002
	Reward System	.087	.070	.110	1.240	.217
	Management Support	.553	.078	.519	7.049	.000
5	(Constant)	.660	.319		2.069	.041
	Work Autonomy	-.073	.064	-.071	-1.143	.255
	Organisational Boundary	.217	.088	.238	2.473	.015
	Reward System	.075	.071	.094	1.054	.294
	Management Support	.536	.080	.503	6.717	.000
	Time Availability	.084	.077	.092	1.097	.275

a. Dependent Variable: Corporate Entrepreneurship

Source: Authors' Computation, 2018

From the Table 5 presented above, Work Autonomy was the first variable entered, followed by Organizational Boundary, Reward System, Management Support and Time Availability. The results show that for the first predictor, beta coefficient is Substantive, positive and significant; $\beta = .313$, $t = 8.534$ and $p \text{ value} = 0.000 < 0.05$. This means that Work Autonomy has significant effect on CE. Beta coefficient for the second predictor, Organizational Boundary is also substantial, positive and significant; $\beta = 0.637$, $t = 8.698$, and $p \text{ value} = 0.000 < 0.05$. In essence, Organisational Boundary has significant effect on CE. Similarly, beta value for the third predictor, Reward System is substantial, positive and significant; $\beta = .293$, $t = 2.959$, and $p \text{ value} = 0.004$ which is less than 0.05. This implies that Reward System has significant effect on CE.

Furthermore, beta coefficient for the fourth predictor is substantial, positive and significant; it has standardized coefficient value of 0.519, $t \text{ value}$ of 7.049 and $p \text{ value}$ of 0.00 which is less than 0.05. This also means that Management Support has significant effect on CE. The fifth predictor equally has a weak and positive beta value; $\beta = 0.092$, $t = 1.097$ and $p \text{ value}$ of 0.275 > 0.05 . This equally implies that Time Availability has positive but insignificant effect on CE. On the strength of relationship, Organizational Boundary showed the strongest statistical relationship with CE. Followed by Management Support, Work Autonomy and Reward System.

Discussion of Findings

Based on the existing literatures and various theories, factors in the internal environment, namely Work Autonomy, Organizational Boundary, Reward System, Management Support and Time Availability influence CE activities in a business organization. It was reported in this research that all these five factors except Time Availability showed significant effect on CE. Interestingly, these findings support existing theory and literatures on CE, especially on the application of CEAI. Particularly, these findings are in line with the recent findings of Olughor (2014). The interesting thing about present research and that of Olughor, (2014) is that both are carried out in Nigeria, but each focused on different industry which gave opportunity for comparison. Findings on factors in the internal environment are supported by Diffusion of Innovation theory and Job characteristics theory as discussed in the chapter two of this study, and are also in consistence with findings of most previous studies from other countries (see Kuratko et al., 2005; Scheepers, 2007; La Nafie et al., 2014) but, with slight differences in some. For example in the work of Kuratko et al. (2005), only Management Support, Work Discretion and Reward/ re-enforcement were found to have significant relationship with CE, Time Availability and Organizational Boundary on the other hand were not found to have significant relationship with CE. Similarly, in Scheepers (2007), it was reported that Management Support, Autonomy and Reward were found to have significant effect on CE.

However the differences that were observed between present research and Scheepers (2007) and Kuratko et al. (2005) can be attributed to differences in the business environment. This result implies that business organizations in Nigeria have a better internal environment that will foster CE than those in USA and South

Africa. Furthermore, contrary to the argument of Sehora and Theerapatvong (2009), it was found out in this research that Organizational Boundary is the most associated with CE.

CONCLUSION AND RECOMMENDATION

The study concludes that manufacturing companies in the North-West of Nigeria have a favourable internal environment that can facilitate corporate entrepreneurship activities and among all the internal factors that influences corporate entrepreneurship, Organisational Boundary accounted for more variations. The study therefore recommends that respective management of every business organizations should develop a means of continuous improvement upon these factors especially organizational boundary, Management Support, Work Autonomy and Reward System. They should try as much as possible to remove all the bureaucratic procedures that can hinder employees from participating in CE activities. They should encourage entrepreneurial behaviours which results in corporate entrepreneurship and workers should be given some degree of freedom to pursue their ideas. They should also keep on reviewing their reward system if they really want to sustain CE strategy; because the economic situation in Nigeria keeps on fluctuating every day. A reward that is considered substantial today may not be seen as appropriate in near future by the employees as a results of bad economic condition.

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IMPACT OF FOREIGN EXCHANGE ON ECONOMIC GROWTH IN NIGERIA 1991Q - 2018Q

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Abstract:

This research paper uses quarterly time series data spanning from 1991Q-2018Q obtained from CBN statistical bulletin. The main objective of the paper is to access the impact of foreign exchange on economic growth in Nigeria, using Vector auto regression (VAR approach), so as to analyze the variations in the variables of study which includes (GDP) gross domestic product, exchange rate, interest rate and inflation rate. Different method of data analysis was employed such as Augmented Dickey Fuller test (ADF) test, Johansen co integration test, VAR model, impulse response, variance decomposition test. From the findings, it was found that there is a positive and significant relationship between interest rate and GDP, so also there exist a negative and insignificant relationship between inflation rate and GDP. From impulse response analyses, it shows that exchange rate from 1st to 5th period has a negative response to GDP while running positive from 5th to 10th period. It is recommended that is necessary for the monetary authorities to pursue and enact policies that will ultimately enhance and ensure effectiveness in exchange rate of the Naira against other key currencies. Measures should be taken to control and manage the increasing inflation rate in the country.

Keywords: Economic growth, Foreign exchange, Interest rate, Inflation.

INTRODUCTION

Exchange rate is among the most important mover of an economy. It influences the flow of goods, services and capital, and also exerts strong pressure on the balance of payment, inflation and other macroeconomic variables. The choice and management of an exchange rate regime is a critical aspect of economic management to safeguard competitiveness, macroeconomic stability and growth. Exchange rate is an important macroeconomic variable used as a parameter in determining international competitiveness and it is being regarded as an indicator of a competitiveness of the currency of any economy and an inverse relationship between this competitiveness exist. The Nigerian Naira averaged to 122.44 from 1960 until 2014 reaching an all-time high of 165.80 in October 2014 and a record low of 0.53 in September of 1980. This shows that the Naira keeps fluctuating and this fluctuation makes it difficult for many nations to trade with each other. the main cause of this fluctuation in exchange rate was due to the introduction of the structural adjustment program (SAP) that needed deregulation of foreign exchange market and this deregulation leads to devaluation of Nigerian Naira. The main purpose of SAP was to restructure the production base of the economy with a positive biased for the production of Agricultural export. The foreign exchange reforms that facilitate a cumulative depreciation of the effective exchange rate was expected to increase in domestic prices of agricultural export and therefore boost domestic production. (Adeniran et al, 2014).

Movements in the exchange rate affect the overall economic activity, it has been a subject of longstanding controversy in macroeconomics and empirical scrutiny in applied policy analysis. In Nigeria, the news of Naira depreciation is mostly greeted with skepticism about macroeconomic soundness of the economy, triggering public and policy debates. The issue is certainly controversial as exporters often demand for downward adjustments of the domestic currency in order to become more competitive in international markets in sharp contrast to protests by consumers and others who rely on imported goods for consumption and production and the increased Naira value of dollar (or other foreign currencies for that matter) get translated into their higher prices. In recent times when the country has witnessed a general rise in prices, currency depreciation is widely regarded as a wrong policy choice contributing to the inflationary pressure. Nigeria officially maintains a

flexible exchange rate policy regime which would imply that in the face of a deteriorating external balance downward adjustment of Naira becomes inevitable. While the exchange rate fluctuating downward focuses mainly on inflation, growth implications are rarely given adequate attention. In theory, currency depreciation is associated with possibilities for both contractionary and expansionary effects on outputs of different sector (Balance of payment theory). This would imply that for any country the net impact has to be determined empirically. Experiences of different countries and regions as demonstrated in different studies differ, further illustrating the need for undertaking country specific empirical analysis

The evolution of the foreign exchange market in Nigeria could be traced back to the establishment of the Central Bank of Nigeria (CBN) in 1958 and subsequent enactment of the Exchange Control Act of 1962. Prior to this period, foreign exchange earned by the private sector used to be held in balance abroad by commercial banks, which acted as agent for local exporters. Similarly, during the period agricultural export contributed the bulk of foreign exchange receipts. The fact that the Nigerian pound was tied to the British pound sterling at par with easy convertibility, delayed the development of an active foreign exchange market. With the introduction of Naira as an official currency of Nigeria, the exchange process commenced. However, it was not until 1982 that comprehensive exchange control was applied as a result of foreign exchange crisis that set in that year.

The exchange control system was unable to evolve an appropriate mechanism for foreign exchange allocation in consonance with the goal of internal balance. This led to the introduction of the Second-tier Foreign Exchange Market (SFEM) in September 1986. Under SFEM, the determination of the Naira exchange rate and allocation of foreign exchange were based on market forces. To enlarge the scope of the foreign exchange market, Bureau de Change was introduced in 1989 for dealing in privately sourced foreign exchange. Additionally, the federal ministry of finance had its allocative powers transferred to the CBN.

As a result of volatility in rates, further reforms were introduced in the foreign exchange marketed in 1994. These included the formal pegging of the Naira exchange rate, the centralization of foreign exchange in the CBN, the reaffirmation of the illegality of the parallel market and the discontinuation of open account and bills for collection as means of payment sectors

LITERATURE REVIEW

Concept of Economic growth

Economic growth is the sustainable increase in the total amount of the goods and services (output) produced in an economy over time. Most times, economic growth is used as a means of knowing how well a country is doing because more output means more trade, more revenue and more consumption. It is an indication of how big an economy is growing, but this does not show how better it is getting. To an economist, economic growth is the sustained increase in the National Income (NI) or the total output of all goods and services produced in an economy. It is an increase in the capacity of an economy to produce goods and services, compared from one period of time to another.

Economic growth according to Todaro and Smith (2011), is the steady process by which the productive capacity of the economy is increased over time to bring about rising levels of national output and income.

Concept of Foreign exchange rate

An exchange rate is the rate at which one country's currency can be traded for another country's currency. The exchange rate is determined in forex market (foreign exchange market). In the forex market, traders buy and sell currencies, taking orders from banks, which in turn take orders for currencies from individual and companies that want to exchange one currency for the another (Colander, 2009).

Concept of Foreign exchange rate fluctuation:

Foreign exchange rate fluctuation refers to the extent to which prices of currencies tends to fluctuate over time (Cote 1994). The measure captures the uncertainty due to unpredictable fluctuation in the exchange rate. Exchange rate fluctuation are therefore a source of risk and uncertainty which tends to impact negatively on risk averse traders or exporters, thus, reducing export (Cote, 1994). Exchange rate fluctuation is the change in value of one currency against another due to various economic factors in simple sense, the value of one currency will be against another (John et al, 2002).

Theoretical Framework

The Purchasing Power Parity Theory

The purchasing power parity (PPP) is one of the earliest and perhaps most popular theory of exchange rate. This posits that the exchange rate between two currencies would be equal to the relevant national price levels. It

assumes the absence of trade barriers and transactions cost and existence of the purchasing power parity (PPP) (Obioma, 2000). Purchasing power parity (PPP) doctrine equates the equilibrium exchange rate of the ratio of domestic to foreign price level. The relevant version of PPP doctrine relates the equilibrium exchange rate to the product of the exchange rate in a base period and the ratio of the countries price indices (Argh, 1994). The purchasing power parity theory defines two equilibrium exchange rate systems. The first is the short run equilibrium exchange rate which is defined, in this context as the rate that would exist under a purely freely floating exchange rate system. Second is the long-run equilibrium that would yield balance of payment equilibrium over a time period in cooperating and cyclical fluctuations in the balance of payment (including those that relate to business cycle at home and abroad).

Empirical Literature

Oladimije (2014), Alabi and Oladele (2015), Fapeta and Oladapo (2016) conducted a research on foreign exchange management and the Nigerian economy. Oladimije, Alabi and Oladele used ordinary least squares while Fapeta and Oladapo used Error Correction Model in the empirical work. From the findings of Oladimiji, Fapeta and Oladapo they found out that there exist a negative and significant relationship between exchange rate and export, direct investment and economic growth. While Alabi and Oladele discovered that there is a very high positive and insignificant correlation between exchange rate, parallel exchange rate and GDP.

Lawal (2017), Bawa (2016), Shehu (2007), Adaramola (2016), Solomon and Naicuta (2015), Affab (2015), Alireza and Nasipour (2014), Sherazod (2007), Ben and Salha (2018), Butu and kashan (2005) made their research work on the impact of exchange volatility on the whole economy. Shehu, Alireza, and Nasirpour used ordinary least square, Adaramola used error correction model, Solomon and Naicuta used linear regression model, Affab used autoregressive distributive lag while others used Exponential Generalized Auto Regressive Conditional Heteroscedasticity model (EGARCH). From these findings Adaramola, Solomon and Naicuta, Butu and Kashan found out that there is a positive and significant relationship between exchange rate, interest rate and inflation while others found negative relationship between exchange rate volatility, export and economic growth.

Abi and Madini (2017), Behmani and Geln (2017), Danladi (2015), Mohammed (2015) Bawu and Ozkan (2011) made research on the impact of exchange rate volatility on international trade from different countries, Bawu and Ozkan used Exponential Generalized Auto Regressive Conditional Heteroscedasticity model (EGARCH). While others used Error Correction model in the course of their research. According to their findings Baum and Ozkan found positive and significant relationship between exchange rate and international trade. While others found a negative relationship between the variables under study.

METHODOLOGY

Data sources and Variables used

In this paper, quarterly time series data on Real Gross Domestic Product (GDP), Exchange Rate, Inflation, Interest rate were collected from Central Bank of Nigeria (CBN) Statistical Bulletin and National Bureau of Statistics (NBS). The data on all the variables cover the period 1991Q-2018Q. Gross Domestic Product (GDP) is the dependent variable, while the independent variables are Exchange Rate, Inflation, and Interest rate.

Model Specification

The specification of model involves the expression of the relationship between variables in mathematical form. That is to specify the model in which the economic phenomena will be explored empirically. The econometrics form of the model is given by:

$$GDP_t = \beta_0 + \beta_1 EXR_t + \beta_2 INTR_t + \beta_3 INF_t + \mu_t$$

GDP is real gross domestic product, EXR denotes exchange rate, INTR represent interest rate, and INF is inflation.

Procedure for data analysis

The properties of the time series were examined using the Augmented Dickey-Fuller (ADF) unit root test to determine their long run convergence and stationarity levels. This study used Johansen cointegration test to verify the presence of a long term or equilibrium, relationship among the variables. If there is no cointegration, Vector Autoregressive Model (VAR) is performed otherwise. Vector Error Correction Model (VECM) is performed.

Impulse Response Function (IRF) and Variance Decomposition were employed to measure the impacts of shocks in the GDP on itself and other endogenous variable in a dynamic system of equations in response to some changes in the exogenous variables.

RESULTS AND DISCUSSION

Unit Root Test

Before estimating the vector autoregressive model and testing for cointegration, unit root test was conducted in order to examine if the variables are stationary or not, the variables were individually subjected to unit root test using the Augmented-Dickey Fuller (ADF) test. The unit root test was conducted and the result of the test is reported at the 5% confidence level. The summary of the result is presented in the table below:

Table 1 Unit Root Test Result

Variables	At level		At first difference		Remark
	Intercept	Trends and intercept	Intercept	Trends and intercept	
LGDP	-1.584473 (0.4867)	-1.599117 (0.7865)	-3.284252 (0.0183)	-3.264621 (0.0784)	1(1)
LEXR	0.175394 (0.9698)	-1.793155 (0.7010)	-3.131218 (0.0274)	-3.272834 (0.0767)	1(1)
LINF	-3.405531 (0.0130)	-2.908246 (0.01644)	-3.285113 (0.0181)	-3.468181 (0.0484)	1(1)
LINTR	-1.588180 (0.4849)	-2.836310 (0.1)	-3.867956 (0.0032)	-3.733618 (0.0244)	1(1)

Source: Authors' computation using Eviews 10

In the table above, the first differenced series of all the independent variables are stationary, which means, that they are integrated of order one I (1) using the ADF result.

Johansen Cointegration Test

Table 2 Cointegrating result where r is the number of cointegrating vectors

Trace tests				Max-Eigen test			
Null	Alternative	Statistics	Critical value	Null	Alternative	Statistics	Critical value
R=0	R=1	53.04385	47.85613	R=0	R=1	29.04158	27.58434
R≤1	R=2	24.00227	29.79707	R≤1	R=2	18.07737	21.13162
R≤2	R=3	5.924909	15.49471	R≤2	R=3	5.917727	14.26460
R≤3	R=4	0.007182	3.841466	R≤3	R=4	0.007182	3.841466

Source: Authors' computation using Eviews 10

Trace test indicate no cointegrating equation at 0.05 level and Max –Eigen also indicate that no cointegrating equation at 0.05 level. The Johansen co-integration test result revealed that the trace and Maxi-Eigen value has no co-integrating factor, which necessitates the conclusion that there is no long-run relationship that exists among the variables employed in this study. That is, there is no long-run relationship between GDP and interest rate, inflation rate, and exchange rate, as such the use of vector auto regression becomes necessary.

Vector Error Correction Model

In the VECM estimates, the ECM coefficient shows how fast the system adjusts to restore equilibrium. The VECM contains cointegration built in to limit the long run behavior of the endogenous variables to allow for convergence cointegrating relationship of variables, while allowing for short run adjustments. Table 3 shows the explanatory variables that are crucial in influencing the economic growth in Nigeria. The estimated VECM satisfies the stability condition since the error correction term is negative and significant based on the values of coefficient of D(LRGDP) and T statistics of -0.3754457 and -3.00657 respectively lying within the accepted region of less than unity.

Table3 Vector Error Correction Model

Dependant variable: (LRGDP)

Variables	Coefficient	Std error	T-Stat
D(LRGDP)(-1)	0.517423	0.23431	2.25856
D(LEXT)(-1)	0.157853	0.03273	6.23513
D(INTR)(-1)	0.136772	0.04233	3.45327
D(INF)(-1)	-0.342095	0.43257	2.34177
C	0.037307	0.01332	3.32174
ECT(-1)	-0.3754457	0.121858	-3.00657
R-squared	0.647877		
Adj. R-square	0.607098		
F-statistic	4.735400		

Source: Authors' computation, using Eviews 10

The results in table 3 show the existence of a long run steady equilibrium between economic growth and the independent variables. The negative value of the error correction model means that, about 37.5% of errors are corrected in succeeding periods. Moreover, the T-statistic (-3.00657) is significant to justify the result. Thus, the coefficient of the ECM measures the speed of adjustment back to equilibrium when the system is disrupted. The result also shows that, 64.8% variation in economic growth (RGDP) is explained by the independent variables. Furthermore, the results also show that, interest rate has a positive relationship with economic growth in the short run, whereas there is a negative relationship between inflation and economic growth in the short run.

4.3 Variance decomposition

Table 3 Variance decomposition at log (RGDP)

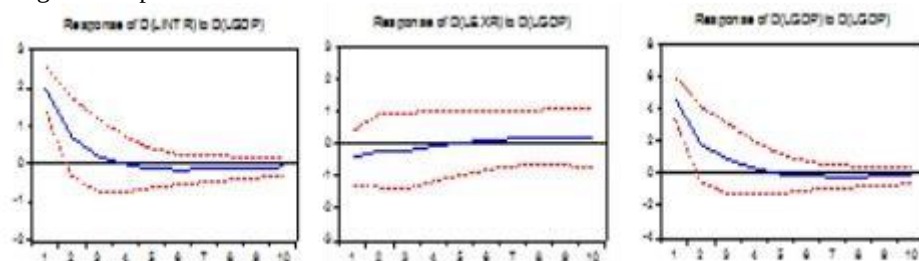
Period	S.E	L(DGDP)	L(DEXR)	L(DINTR)	L(DINF)
1 st	4.688339	100.0000	0.000000	0.000000	0.000000
5 th	5.200153	96.99946	0.014056	2.690467	0.296014
10 th	5.251041	95.65814	0.570196	3.412044	0.759623

Source: Authors' computation using Eviews 10

The variance decomposition estimates for the horizon of ten years and contribution of each variable's own shock to the shock of other variables are presented in table 3 above. It describes the contribution of RGDP, EXR, INTR and INF to their own shock and explains the proportion of forecast variance for a ten year period. The proportional individual contributions are presented in the variance decomposition table, for RGDP which indicates that 95% of the variation in RGDP is due to its own shock after ten years, 1% due to the shock of exchange rate, 3% due to the shock of interest rate, while 1% is due to shock of inflation.

Impulse Response Function

The impulse analyses revealed that the GDP of the economy response to positively to itself in the 1st and 5th period while from the 5th to 10th period, it became flatter. There exists a negative response from the exchange rate in the 1st to 5th period while running positive from 5th to 10th period. A positive relationship exists between interest rate and economic growth. There is a fluctuation in inflation response to GDP, there exist a positive response but later became negative from 2nd to 7th period. There is a dichotomy response of GDP to inflation as there is both positive and negative responses.



CONCLUSION AND RECOMMENDATIONS

Using the endogenous growth theory, this paper has made use of an empirical specification, based on the findings of the study, it indicates a positive and significant relationship between interest rate and the GDP, also there is a negative and insignificant relationship between inflation and GDP, while there is a significant and positive relationship between exchange rate and GDP at the first period also positive at end period. The estimation strategy has duly examined the time series quarterly properties of the variables in regression analyses to avoid the problem of finding out spurious relationships and invalid inferences. In light of the stationarity of

the model variables cointegration techniques have been used to present and validate the short-run estimates applying the VAR techniques, impulse response and variance decomposition.

Finally, based on results obtained, the following recommendations are offered:

- i. is necessary for the monetary authorities to pursue and enact policies that will ultimately enhance and ensure effectiveness in exchange rate of the Naira against other key currencies.
- ii. Measures should be taken to control and manage the increasing inflation rate in the country.
- iii. An attempt should be made to moderate and revise the interest rate of the country so as to attract more investors and also to give way for more economic growth and reduce import dependency of the country.
- iv. The government should pursue the policy of encouraging the consumption of made in Nigeria goods so as to curb the problem of excess demand for foreign currencies that always lead to rise in exchange rate.
- v. Devaluation of currency policy should be checked and put into consideration.
- vi. Lastly, the monetary authorities should advocate strict exchange rate control policies that
- vii. It will aid the determination of appropriate exchange rate value.

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EMOTIONS AND PERSONALITY TRAITS ON OPPORTUNISTIC BEHAVIOUR OF ACCOUNTANTS IN KWARA STATE

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Abstract:

The main purpose of accounting rules is to ensure true and fair financial reporting to the users of accounting information, any desecration of these rules, no matter how important or the purpose or method, is not just a violation of accountants' professional norms but is also a violation of multiple universal ethical/moral principles, such as not to lie, not to deceive, always to be honest and truthful. Consequently, the decision whether to engage in accounts manipulation or not, is never just a business dilemma but always and necessarily also an ethical/moral one. Therefore, it can be expected that personality traits, related to individuals' ethical decision-making, might be of particular importance for one's attitudes toward accounts manipulation behaviour. Thus, this study examined the influence of emotions and personality traits on opportunistic behaviour of accountants in Kwara State, Nigeria. Specifically, the studies evaluate the effect of openness to experience, conscientiousness, extraversion, agreeableness neuroticism on opportunistic behaviour of accountants'. The non-probability purposive sampling was employed, where only 200 respondents in private sector were chosen. Using ordered logit regression, the results of study showed that the personality traits of accountants are generally associated with reduction in opportunistic behaviour (earnings manipulations/fraud). It was recommended that, managers and employers should make a focus on selection of accountants with personality traits that positively influence job outcomes, so accountants who are more extravert and are more conscientious, will not engage more in opportunism, which will be beneficial for the organizations, counseling programmes should be organized for people (accountants) high on neurotic tendencies to help teach them on how to respond to live stressors and accountants emotion must be taken into consideration for designing and implementing plans to mitigate harmful accounting practices.

Keywords: Opportunistic Behaviour, Accounting Choices, Emotions and Personality Traits.

INTRODUCTION

Accounting systems is a complex whole and often the most important formal sources of information in organizations. They are designed to provide all levels of management and other stakeholders with timely and reasonably accurate information to help them make decisions which are in tandem with their organisation's goals. More so, the accounting information provided by the system is assumed to be accurate, fair and reliable by its users. Since the primary purpose of financial statements is to deliver annual organisation's financial information to both external and internal stakeholders in a reliable and timely manner, a major element of the report is accounting earnings, which are used to assist the users in making decisions. Given that the main purpose of accounting rules is to ensure true and fair financial reporting to the users of accounting information, any violation of these rules, no matter the purpose or method, is not just a violation of accountants' professional norms but is also a violation of multiple universal ethical/moral principles, such as not to lie, not to deceive, always to be honest and truthful. Consequently, the dilemma (decision), whether to engage in accounts manipulation or not, is never just a business dilemma (decision) but always and necessarily also an ethical/moral one. Therefore, it can be expected that personality traits, related to individuals' ethical decision-making, might be of particular importance for one's attitudes toward accounts manipulation behaviour (Horvat, 2018). Preparers of financial statements have personality traits (conscientiousness, agreeableness, extraversion, neuroticism, and openness to experience) and every time the preparers of financial statements make accounting choices that do not portray the economic and financial situation of the company, they are increasing the chance of corporate fraud. This kind of behaviour is called opportunistic behaviour which includes the practices of earnings management (EM), fraud and fair representation. Earnings management is often associated with misleading activities that occurs for purposes of hiding deteriorating performance (Boubakri, Boyer & Ghalleb, 2008). When issues regarding fraud and earnings management are concerned, attentions are mostly focused on the management team and the accounting officers of the firm. The accounting officers are expected to be honest, fair and uphold the ethical standard of accounting profession.

However, the ability and non-capability of account officers to involve in fraud and earnings management depends on their behaviour. Thus, this study can be situated

in the area of behavioural accounting and therefore explained the behaviour of accountants as explained by their personal traits and emotions.

Events in the business world around the globe have shown that some financial information given by accountants is not wholly truthful and reliable. The corporate world had suffered monumental economic loss as a result of fraud and earnings management perpetrated by managers in conjunction with the account officers. The financial information given is not wholly truthful and reliable in some cases (Almahrog, Marai & Knežević, 2015). Evidence shows that, when accounting information is manipulated in order to mislead users as to an organisation's real financial position and performance, consequences can be negative for a great many stakeholders. In the 1970s and early 1980s, a large number of studies found that accounts officers/managers can exercise discretion through the choice of accounting methods or policies. For example, managers can use specific accounting policies for inventory valuation, depreciation method or the treatment of bad-debt provision; all leading to manipulation of earnings (Sun & Rath, 2010). Watts and Zimmerman (1978) documented that managers will lobby for and choose accounting policies which can decrease tax payments, help secure favourable regulations, reduce political costs, reduce information production costs, and increase accounting earnings. They developed a positive accounting theory which suggests managers will always choose accounting policies that lead to the maximization of their personal wealth. In Nigeria, corporate organisations such as banks, Oil firms and telecommunication have experienced financial crises as a result of fraud and earnings management activities undertaken by those organisations (Okaro, Okafor & Ofoegbu, 2013; Udo, 2017). Despite the regulations from different regulatory authorities in Nigeria and the adoption of international financial reporting standard (IFRS) in 2012, the corporate world still experienced high corporate fraud and earning management (Milan & Weffort, 2015).

LITERATURE REVIEW

2.1 EMPIRICAL REVIEW

De Bortoli, Da Costa, Goulart and Campara (2019) study explored which of four paradigms best portrays the risk profile manifest by investors in their financial asset investment decisions. The paradigms used to explain this profile were: prospect theory, investor profile analysis (IPA), the Big Five Personality Test, and the Cognitive Reflection Test (CRT). The results were analyzed using ordered logistic regression and show that people who have a high degree of openness to experience have the greatest probability of taking higher levels of risk in their investment decisions. With regard to the CRT, higher numbers of correct responses in this test has an inverse relationship with risk taking.

Horvat (2018) selected three personality traits to test for their impact on Slovenian accountants' attitudes toward accounts manipulation behaviour. Responses from 310 chief accounting officers of Slovenian medium-and large size companies were gathered via electronic survey, and correlational and regression analyses were performed to investigate relationships between selected personality traits and participants responses to the scenario, thus depicting accounts manipulation behaviour in violation of generally accepted accounting principles. Only two of the observed personality traits (Machiavellianism and agreeableness) were found to be statistically significantly related to accountants' attitudes.

Aftab, Rashid and Shah (2018) examined the direct effect of extraversion and conscientiousness with interactive effect of positive psychological capital on organisational citizenship behaviour (OCB) among university teachers. Data was gathered through random sampling from teachers of public and private sector universities of four provinces of Pakistan. Extraversion and conscientiousness were measured by the extraversion and conscientiousness subscales of the big five inventory. Positive psychological capital questionnaire was used to measure positive psychological capital. Results showed that extraversion and conscientiousness significantly and positively predicted organisational citizenship behaviour.

Hachana, Berraies and Ftiti (2018) provided a conceptual and empirical clarification of the extent to which the Big Five personality traits of openness to experience, extraversion, neuroticism, conscientiousness and agreeableness affect entrepreneurial success in an emerging country context. 174 Tunisian entrepreneurs were surveyed by using a questionnaire and the partial least squares method and multi-group analysis was piloted to test the six research hypotheses. The results clearly demonstrate that entrepreneurial personality traits that relate significantly to business success are characterized by high emotional stability, openness to experience, and conscientiousness. Further, the results illustrate that gender moderates the association between personality and entrepreneurial success.

Using primary data collection through questionnaire survey on accounting students in one of the Malaysian government-linked university and partial least square (PLS) tool, Esa and Zahari (2015) aimed to investigate the influence of personality traits towards love of money (perception to money) and ethics. The results indicated that accounting students had a positive attitude towards money. Thus, the results supported the notion that the relationship contribute to greater awareness and sensitivity of students pertaining what is ethical and what is not and may behave differently in moral dilemma.

METHODOLOGY

3.1 Model Specification

The model was specified to examine opportunistic behaviour of the subjects in accounting choices; influence of personality traits/emotion. The relationship between opportunistic behaviour and personality traits/emotion as established is mathematically expressed as:

$$\text{Opportunistic Behaviour} = f\{\text{Personality Traits}\} \quad (3.1)$$

$$OB = f\{OPEN, CONS, EXTR, AGRE, NEUR\} \quad (3.2)$$

This was expressed econometrically as follows:

$$OB_i = \beta_0 + \beta_1 OPEN_i + \beta_2 CONS_i + \beta_3 EXTR_i + \beta_4 AGRE_i + \beta_5 NEUR_i + \mu_i \quad (3.3)$$

Where,

$OPEN_i$ = Openness to Experience

$CONS_i$ = Conscientiousness

$EXTR_i$ = Extroversion

$AGRE_i$ = Agreeableness

$NEUR_i$ = Neuroticism

OB_i = Opportunistic behavior

μ_i = Random error term

β_0 = constant

to β_5 β_1 to β_5 = estimated coefficients

A-priori expectation = $\beta_0 > 0$, $\beta_1 > 0$, $\beta_2 > 0$, $\beta_3 > 0$, $\beta_4 > 0$, $\beta_5 > 0$.

Research Design

The study adopted the descriptive survey research design to examine personality traits as predictors of opportunistic behavior of accountants of private organizations in Kwara State. This design was used because there was no manipulation of variables; the study only reported what already existed. A battery of psychological instruments was administered to collect detailed information from respondents and then coded using quantitative methods.

The non-probability purposive sampling was employed, where only 200 respondents in private sector were chosen. The administration of the questionnaire was carried out with the help of research assistant. Comprehensive explanation of items on the subject matters was done so as to ensure quality of results and avoid obscurity. Data used for this study is primary in nature obtained through questionnaire from accountants. The questionnaire was structured into three sections: section A "demographic section" contains the personal data of respondent basically to enable us determine the level of sex, experience and education. Section B contains questions and answer options on personality traits and opportunistic behaviour. This source of data collection becomes necessary especially on those matters that cannot precisely be expressed through the use of secondary data.

3.2 Method of Data Analysis

The study used both descriptive and inferential statistical techniques in analyzing the data obtained through the administered questionnaires. Percentages and frequencies were used for descriptive statistical analysis. Ordered logit regression analysis was employed for inferential statistical analysis.

This chapter deals with the presentation and analysis of data gathered during the empirical investigation. The data presented and analyzed here was obtained from primary source through questionnaire.

INTERPRETATION AND DISCUSSION OF RESULT

Analysis of Research Questions

Table 4.1: Questionnaire Administration

Questionnaire	Respondent	Percentage (%)
Returned	172	86
Not Returned/Wrongly Filled	28	14
Total	200	100

Source: Field Survey, 2019

Table 4.1 shows that out of one hundred and eight questionnaires distributed, only 172 i.e. 86% of it were returned as duly completed while the remaining 28 i.e. 14% were not returned or wrongly filled by the respondents.

Table 4.2: Ordered Logit Estimates for Opportunistic Behaviour

		Co-eff. (P-value)
Constant		3.2699 (0.309)
Openness	to	0.4701 (0.007)*
Experience		0.1859 (0.008)*
Conscientiousness		0.3726 (0.085)**
Extroversion		0.3251 (0.000)*
Agreeableness		-0.0904
Neuroticism		(0.035)***
Pseudo R ²	0.3878	
LR-chi2	41.73	
Prob (chi2)	0.0021	

Notes: *, ** and *** denotes statistically significant at 1%, 5% and 10% significance level respectively. Also, p-values are reported in parentheses.

Source: Field Survey (2019)

Table 4.2 presents the ordered logit regression result for examining the personality traits/ emotions on opportunistic behaviour of accountants in Kwara State, which is estimated with opportunistic behaviour as the dependent variable and openness to experience, conscientiousness, extroversion, agreeableness and neuroticism as the independent variable. The result shows that all the independent variables are positively related to opportunistic behaviour except neuroticism. This means, the less in possessing these attributes of personality traits, the more likelihood of high opportunistic behaviour of accountants.

More so, the result indicates that all the independent variables (openness to experience, conscientiousness, extroversion and agreeableness) are statistically significant at 5% except neuroticism. This is shown by the coefficients of the variables 0.4701, 0.1859, 0.3726, 0.3251 and 0.0904. Coefficient of a variable is said to be significant if the standard error is less than half of the value of the coefficient.

The fitness statistic used in these models is the Log Ratio (LR) chi-square statistics reported along with the coefficient estimates in table 4.4. A model is considered to have a good fit when the P-value of the LR statistics is less than the traditional levels (1%, 5% and 10%) of significance used in social and management sciences. Otherwise the fitness of the model is said to be bad. The Log Ratio statistics of the ordered logit regression models presented in table (4.2) is 41.73 with P-value 0.0021. This shows that all the models have a good fit and their results are valid and plausible for tenable policy inferences.

DISCUSSION

The study examines the personality traits as predictors of opportunistic behaviour among accountants in Kwara State. The first hypothesis which states that openness to experience will not independently significantly predict the opportunistic behaviour among accountants was rejected based on the findings. The analysis findings show that openness did significantly predicts opportunistic behaviour among accountants. The finding does not contradicts the findings of Gallant and Connell (2003) who reported that openness is positively associated with psychological health. The study of De Bortoli *et al.* (2019); Ongore (2013) Saadullah and Bailey (2014) also posited that high degree of openness to experience have the greatest probability of taking higher levels of risk in their decisions.

The second hypothesis which states that conscientiousness will not independently significantly predict the opportunistic behaviour among accountants was rejected based on analysis result. The findings indicate that conscientiousness is significantly related with opportunistic behaviour. This finding is in tandem with the study of Saadullah and Bailey (2014); Ongore (2013); Hakimi *et al.* (2011) which showed conscientious as the most important predictor variable. However, taking a cursory view on the work of Bogg and Roberts (2004), their findings contradict the findings of this present study when they reported that individuals who scored high on conscientiousness have greater chance of practicing opportunistic behaviour. Better mental wellbeing is noticed among individuals who score high on conscientiousness. Conscientiousness is one's tendency towards self-discipline, hard work, and a high level of achievement drive.

Finally, the overall finding of the study is connected to social cognitive theory. In social cognitive theory, dispositions are personal factors such as self-beliefs, aspirations, and outcome expectations which regulate behaviour rather than descriptors of habitual behaviour.

5. RECOMMENDATION

- Managers and employers should make a focus on selection of accountants with personality traits that positively influence job outcomes. So accountants who are more extravert and are more conscientious, will not engage more in opportunism, which will be beneficial for the organizations.
- Counseling programmes should be organized for people (accountants) high on neurotic tendencies to help teach them on how to respond to live stressors.
- It may be possible to incentivize some of these positive personality traits, for example by making stakeholders including accountants aware of how they can play to their strengths and convert these positive psychological characteristics into improved performance.

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