IMPACT OF SOCIAL INFRASTRUCTURE ON ECONOMIC GROWTH IN NIGERIA

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Abstract
The paper examined the impact of social infrastructure on economic growth in Nigeria based on annual time series data from 1986 to 2020. The Autoregressive Distributed Lag (ARDL) model was utilized to establish the relationship among variables. The estimation of the model was preceded by some preliminary analyses including descriptive statistics, correlation analysis, unit root tests and cointegration analysis. The empirical findings revealed that government expenditure on education had a negative significant effect on economic growth in Nigeria both in the short run and long run time horizons. The findings also revealed that government expenditure on health significantly promoted economic growth in Nigeria in the short run period while its impact in the long run period was found to be insignificant. Moreover, Electricity consumption had a positive and significant effect on economic growth in Nigeria in the short run as well as the long run. The empirical finding affirmed the apriori sign expectation of a negative relationship between the Inflation rate and economic growth as posited in the literature. The paper, therefore, recommends that government should increase not just the amount of expenditure made on the education and health sectors, but also adopts the percentage benchmark recommended by UNESCO (2010). Also, the government should boost electricity generation and distribution by providing the needed facilities. Finally, the rate of inflation should be well monitored to encourage investment in Nigeria.

Keywords: Economic Growth, Auto-Regressive Distributed Lag, social infrastructure

JEL: C88, H51, H52, H54

1. Introduction

There are several indices for measuring national economic growth and social infrastructure is one of the most essential to be considered recently. Social infrastructure at present influences both the gross domestic product and the number of the employed population, the rates of profit

growth, the volume of capital investments, and the level of innovative economic activity in a country (Kokurin & Nazin, 2011).

Social infrastructure perception goes beyond the simple classification of physical or 'hard' that also includes soft infrastructure that helps in the requirement of human services delivery. (South Australian Council of Social Service (SACOSS), 2009) and (Williams & Pocock, 2010; Casey, 2005).

In Nigeria, one of the predicaments of social infrastructure is visible in the educational sector which is skewed in the trend of recurrent expenditure on education relative to other sectors of the economy. In 2011, the sector was allocated N393.8 billion, 9.3 per cent of the total budget while it got N468.3 billion, 9.86 Per cent of the 2012 budget; N499.7 billion representing 10.1 per cent of the total 2013 budget; N494.7 billion 10.5 per cent of the 2014 budget (CBN, 2021). In 2015 and 2016, the federal government budget for education was N392.4 billion and N369.6 billion representing 15.05% and 9.32% respectively of the total budget, N550. 5 billion was allotted in 2017, representing 7.4 per cent of the total budget; N605.8 billion in 2018 -7.04 per cent; N620.5 billion 7.05 per cent of the 2019 budget and N671. 07 billion (6.7 per cent) in the 2020 appropriation bill. In 2021, out of the N13.08 trillion budgeted for the year, N742.5 billion was allotted to education (CBN Statistical Bulletin, 2021). That is just 5.6 per cent, the lowest percentage allocation since 2011. This allocation is far below the 26% recommended by the United Nations Education, Social and Cultural Organization (UNESCO, 2010) for developing countries.

The budget for 2021 proposes N547 billion for healthcare, about seven per cent of the budget's total of N13.08 trillion. The amount comprises N380.21 billion for recurrent expenditure and N132 billion for capital projects. (CBN Statistical Bulletin, 2020). Nigeria's highest-ever public budget share for its health was seven per cent. That figure fell to less than 4 per cent in 2019. It means, in a way, the seven per cent proposed for 2021 is an improvement over the 2019 and 2020 figures (CBN Statistical Bulletin, 2020).

These and the other elements of social infrastructure including the creation of job opportunities and workforce training and skill acquisition possess the potential for enhancing economic growth in the country this paper is aimed at establishing a functional connection between social infrastructures and the economy which is vital in the improvement of the quality of life of the citizens.

Infrastructures in such critical areas as education, health services, potable water, and electricity development can serve as an incentive to attract certain levels of industrial/economic activities in the economy, in that wise, provision of infrastructure facilitates investment in less developed economies.

Substantial evidence exists that disagrees that the economic benefits of providing social infrastructure far outweigh the costs of provision (Casey, 2005; Karoly & Bigelow, 2005). Casey (2005) rightly summarized that 'investment in social infrastructure has an economic gain as well as a social one and, therefore, there is an indisputable reason to include provision for social infrastructure.

Many of the catastrophes that have befallen the Nigerian environment have been traced to the poor social infrastructure nature of the economy ranging from a low level of literacy, poor health care delivery system and youth unemployment (Ogbaro & Omotoso, 2017).
The function of electricity in boosting any economy towards growth on the other hand has been undermined by the persistent power outage in Nigeria. Electricity plays an essential role in all aspects of development, ranging from industry, education, environment, agriculture and socio-economy in general (Udah, 2010).

The shocking performance of the Nigerian economy in the face of huge government expenditure to boost economic performance has made it indispensable to examine the impact that social infrastructure had on economic growth in Nigeria. Hence, this paper seeks to examine the relevance of social infrastructure as well as government expenditures on those variables that constitute social infrastructural development and their attendant impacts on the overall performance of the economy in terms of GDP growth within the time frame of 1986 to 2020. The paper is structured into the following sections: section one is the introduction, followed by a literature review in section two, section three contains the theoretical framework and methodology, section four is the presentation and analysis of results and section five is the makeup of summary, conclusion and recommendations.

2. Literature Review
2.1 Conceptual review
Infrastructure is the basic physical and organizational composition needed for the function of an economic environment. Infrastructural installations do not directly produce goods but help in boosting production/economic activities in a country. These services include roads, railways, ports, airports, dams, power stations, oil and gas pipelines, telecommunication facilities, etc. They also include the country's educational system including schools and colleges, the health system including hospitals, the sanitary system including clean drinking water facilities and the monetary system including banks, insurance and other financial institutions. Infrastructure is broadly classified as social and economic infrastructure (Sawada, 2015).

Economists and politicians, refer to social infrastructure as an investment in human capital, through the provision of physical elements that help in the provision of human services as stated by the South Australian Council of Social Service (SACOSS, 2009).

Infrastructures as defined by Zhurauskaya (2018) are basic essential services that should be put in place to enable development to occur. Infrastructure is a great tool needed by the economic environment to achieve its economic objectives.

Slocock (2018) described social infrastructure to include the following key components: building and the built environment (libraries, parks, and community hall), services and organizations (education, health care, and youth services and leisure), and strong communities. Olowofeso, Adeleken and Udoji (2015) detected the existence of divergent conceptions of economic growth and ways of measuring it, but the prime definition is in terms of growth in the long-run productive capacity of the economy, typically measured by real growth in Gross Domestic Product (GDP). The economic growth of a nation is related to the variation in certain macroeconomic fundamentals such as the index of industrial production, inflation, exchange rate, manufacturing capacity utilization, etc. which are considered in macroeconomic policy formation and implementation. Economic growth is used to ascertain the general well-being or health of a nation at any given point in time. Whenever economic activity slows down due to

exogenous shocks, such as a recession or depression globally could result in low production and unemployment. (Moinescu & Codirlasu, 2013).

Jhingan (2005) affirmed that economic growth cannot take place without the importance of human capital. He aggregated human capital development as education or schooling, training and health care delivery. This aggregation of human resource development could further increase productivity, and income, improve health and fitness, and good habits in individuals such as being trustworthy and responsible. Therefore, education, training and health care are the most imperative factors in human resource development.

2.2   Theoretical review
The paper linked several theoretical foundations including the classical theory of economic growth, the innovative growth theory of Schumpeter, Keynesian and Post-Keynesian growth theories, the neo-classical growth model and the exogenous growth model of Robert Solow, and the endogenous growth model. However, the paper is hinged on the endogenous growth model.

Romer and Lucas hypothesized about the endogenous character of the most important technological innovations based on investment in technological development and human capital. In the theories of endogenous growth, technological progress is not the only possible cause of economic growth in the long term. The value of intensive, high-quality determinants of economic growth (parameter A in neoclassical theory) is defined in the theories of endogenous growth with the following factors: The quality of human capital, which depends on investment in human development (education, health); Creation of the necessary conditions and prerequisites for the protection of intellectual property rights in the conditions of imperfect competition; State support for the development of science and technology; The role of government in creating a favourable investment climate(social infrastructure) and attracting new technologies.

Thus, endogenous growth theories allowed formalizing the relationship between the mechanisms of economic growth and the process of obtaining and accumulating new knowledge, which is materialized in technological innovations. These theories examine the reasons for the differences in growth rates of different countries, the effectiveness of various measures of the state's scientific, technical and industrial policies, as well as the impact of the processes of infrastructures on economic growth.

2.3   Empirical review
Ogbaro and Omotosho (2017) examined the role of infrastructure development in promoting economic growth in Nigeria over the period 1980-2015. A Cobb-Douglas production function which models infrastructure as a stock variable was specified and estimated using the ordinary least squares method. The study found positive and significant effects of total air transport infrastructure, communication infrastructure, power infrastructure and total rail lines on economic growth within the period of the study.

Babatunde (2018) investigated government spending on infrastructure. Both primary and secondary data were used for the study. The secondary data comprised reported annual spending on selected infrastructure and annual Gross Domestic product from 1980 to 2016 for Nigeria. Weighted least square was used to test the sample of 37-year annual time series using a vector error correction model. For the primary data, samples of 242 respondents were utilized

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for the study. Statistical random sampling was used for the sample selection. Findings from the study indicated that government spending on transport and communication, education and health infrastructure has significant effects on economic growth; spending on agriculture and natural resources infrastructure recorded a significant inverse effect on economic growth in Nigeria.

Gana, Abdulrahim, Ewah and Nnabugwu (2020) examined the role of public infrastructure in the industrialization of the Nigerian economy for the period 1981 to 2016. The study investigated the impact of infrastructure in a VAR environment, after subjecting the data to a pre-test to check the stationarity and co-integration of the variables. The work embarked on variance decomposition to examine the impact of infrastructure on the manufacturing sector. Their findings revealed that expenditure on infrastructure does not significantly impact the manufacturing output in the short run, but becomes more significant in the long run.

Udo, Abner, and Idogen (2018) examined the effect of increasing infrastructural development expenditure on economic growth in Nigeria from 1989-2017. The Johansen co-integration, Error Correction Model (ECM) and the Ganger Causality test were employed in their analysis. Public expenditure and economic growth variables were found to be non-stationary and co-integrated, thus substantiating a long-run equilibrium condition. The ECM result indicated that the disequilibrium caused by infrastructural degeneration in the previous year is adjusted back to equilibrium at the speed of 20% annually. They observed that Wagner's law and Fiscal Illusion exist in Nigeria within the period of the study.

Sabir and Shamshir (2020) analyzed the effect of infrastructure on the long-run economic growth of Pakistan for the period 1971–2014 using the Autoregressive Distributed Lag (ARDL) method. Infrastructure was disaggregated into economic and social infrastructure to evaluate the impact on economic growth. Their findings revealed that road infrastructure has a negative influence on per capita GDP. However, energy consumption, electricity consumption, secondary school enrollment and life expectancy were observed to be positive and significant on per capita GDP within the timeframe of the study. Similarly, the composite economic infrastructure index and human capital index have a positive impact on GDP per capita.

Itumeleng and Aye (2017) investigated the effect of social infrastructure on economic growth and inequality in South Africa using an SEM approach from the period 1991-2019. They used growth as the mediating variable while controlling for production factors, urbanization and globalization. Their findings indicated a positive and significant correlation between education expenditure and growth. However, there is a negative but insignificant linkage between health expenditure and growth. Furthermore, the findings revealed a negative but insignificant relationship between education and inequality and a significant negative association between health and inequality. Consistent with the Kuznets theory, they observed a positive and significant relationship between growth and inequality in South Africa.

Hardianti, Lubis, Ruslan, Mukarramah and Yolanda (2020) analyzed the effect of economic and social infrastructure on economic growth in Indonesia using cross-sectional data from 2001-2018. The independent variables used in this study are road infrastructure, electricity infrastructure, health infrastructure and education infrastructure. Data were processed using panel data based on the fixed effect model. The results showed that economic and social infrastructure simultaneously had a significant effect on economic growth. Partially road infrastructure, electricity infrastructure, and health infrastructure have a positive and significant

effect on economic growth while education infrastructure has a positive but not significant effect on economic growth in Indonesia.

Onwuemeka, Nwogwugwu and Onwuka (2022) examined the relationship between government spending on economic infrastructure and economic growth in Nigeria from 1989 to 2018. The Autoregressive Distributed Lag Bounds method to co-integration was chosen to ascertain the impact and the long-run relationship between the dependent and independent variables. The short-run and long-run results showed that government spending on power exerted a positive but insignificant effect on Nigeria's RGDP. However, government spending on transport and communication had a positive relationship in the short run but a negative relationship in the long run. Their Causality results indicated a uni-directional causality running from RGDP to GEXP and EMP to GEXTC but there was no evidence to support the existence of causality between the remaining pairs of the variable.

2.4 Gaps in existing Literature

There is generally elaborate literature on the impact of physical infrastructure on economic growth in Nigeria, such as Ogbaro and Omotoso(2017), and Nedozi *et al* (2014) which disaggregated physical infrastructure in terms of air transport, communication and power. However, there exists a considerably scarce literature on the impact of social infrastructure on economic growth in Nigeria. Similarly, those studies did not disaggregate social infrastructure in terms of health, education and electricity consumption, hence, this paper seeks to advance the different components of social infrastructure in evaluating the impact these components have on economic growth, also to extend the scope to recent time in Nigeria to fill the identified gaps in the existing literature.

3. Research Methodology

Theoretical Framework

In analyzing the impact of infrastructure development on economic growth in Nigeria, this paper employed the theoretical approach which models infrastructure as a stock variable. Given this, it adopted the approach of Canning and Pedroni (2004) which used a supply-side model to evaluate the impact of infrastructure on growth with physical measures of infrastructure.

This is based on Barro (1990) models which captured infrastructure in the context of a simple AK endogenous growth model. The two building blocks of his model are production function that incorporates public services. The focal point that makes this growth theory relevant to our study is the two-way interplay between health and economic growth. Two preliminary efforts in this direction are Ehrlich and Lui (1991) and Meltzer (1995). Also, the empirical work of Barro (1996) and others suggested that health status, as measured by life expectancy or analogous aggregate indicators, is an important contributor to subsequent growth.

The endogenous growth theory of Barro (1990) asserts that productivity improvements can be tied directly to faster innovation and more investments in human capital. As such, they advocate for government to nurture innovation initiatives and offer incentives for individuals and businesses to be more creative, such as research and development (R&D) funding, intellectual property rights and improved health investment which engineers the productivity of labour. Hence, the idea of a knowledge-based economy, the spillover effects from investment in technology and people keep generating returns.

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Model Specification

Based on the above views the paper adopted the approach of Canning and Pedroni (2004) that used a supply-side model to analyze the impact of infrastructure on growth with physical measures of infrastructure.

The model specified is shown below: $GRR = F[GXE, GXH, ELC, IFR]$ (1)

This re-specified econometrically as:

$$GRR_t = \alpha_0 + \alpha_1 GXE_t + \alpha_2 GXH_t + \alpha_3 ELC_t + \alpha_4 IFR_t + \mu_t \quad (2)$$

Again the model was transformed into the log form as

$$GRR_t = \alpha_0 + \alpha_1 \ln GXE_t + \alpha_2 \ln GXH_t + \alpha_3 \ln ELC_t + \alpha_4 \ln IFR_t + \mu_t \quad (3)$$

From the above, the long-run Autoregressive Distributed lag scheme can be specified as follows

$$GRR_{t-1} = \beta_0 + \beta_1 \sum GRR_{t-1} + \alpha_2 \sum_i^n \lambda it - 1 + \varepsilon_{t-1} \quad (4)$$

$$(GRR_{t-1}) = \alpha_0 + \alpha_1(GRR_{t-1}) + \alpha_2 \ln(GXE_{t-1}) + \alpha_3 \ln(GXH_{t-1}) + \alpha_0(IFR_{t-1}) + \sum_{i=1}^{\rho} \Phi_1 \Delta(GRR_{t-1}) + \sum_{i=1}^{\rho} \Phi_2 \Delta \ln(GXE_{t-1}) + \sum_{i=1}^{\rho} \Phi_3 \Delta \ln(GXH_{t-1}) + \sum_{i=1}^{\rho} \Phi_4 \Delta(IFR_{t-1}) + \mu_{t-1} \quad (5)$$

Table 1: Variable description

S/N	Variables	Description	Apriori Sign
1	GRR	Gross Domestic Product Growth rate. A measure of Economic growth	
2	GXH	Government Health Expenditure. This is a measure of government investment in health care.	+
3	GXE	Government Expenditure on Education. Measures government investment in Education	+
4	ELC	Electricity Consumption	+
5	IFR	The inflation rate, given by the consumer price index, measures economic stability.	_

Source: Author's compilation (2022).

Estimation Technique

The paper adopted the Auto-Regressive Distributed Lag (ARDL) model bound testing approach (Dickey & Fuller, 1979) this model was developed by Pesaran, Shin and Smith (2001) and is an OLS model which is applicable for both non-stationary time series as well as time series with mix order of integration. It helps in predicting the current values of a dependent variable based on the current values as well as lagged values of the explanatory variables. The method helps to take care of the problem of drifting series and equally enables us to determine both the short-run and the long-run relationship of the model (Ahmed, Zaman, & Syah, 2011). The ARDL approach, developed by Pesaran, Shin, and Smith (2001), was chosen over the conventional Engle and Granger (1987) and Johansen and Juselius (1990) approach for the long-run test (cointegration) as a result of its advantages over them.

This approach enjoys several advantages over the traditional co-integration technique documented by (Johansen & Juselius, 1990). First, it requires a small sample size. Two sets of critical values are provided, low and upper-value bounds for all classification of explanatory variables into pure I (1), purely I (0) or mutually co-integrated. Indeed, these critical values are generated for various sample sizes. However, Narayan (2005) argues that existing critical values of large sample sizes cannot be employed for small sample sizes. Second, Johansen

(1988) procedure requires that the variables should be integrated in the same order, whereas ARDL approach does not require variables to be of the same order. Third, ARDL approach provides unbiased long-run estimates with valid t-statistics if some of the model repressors are endogenous (Narayan, 2005 and Odhiambo, 2008). Fourth, this approach provides a method of assessing the short-run and long-run effects of one variable on the other and as well separates both once an appropriate choice of the order of the ARDL model is made (Iheanacho, 2017). In this regard, Pesaran, Shin and Smith, (2001) explained that Akaike information criterion (AIC) and Schwarts criterion (SC) performed well in the small sample, but SC is relatively superior to AIC, therefore, either of the above recommendations would be used as a criterion for the selection of the optimal lag length for the model. The ARDL model is as indicated in equation 5 above.

Sources of Data

The data used in the paper are secondarily obtained from published documents. The time series data are obtained from various issues of the Central Bank of Nigeria (CBN) annual statistical bulletins and World Bank development indicators database for the period of 1986 to 2020.

4.   Presentation and Analysis of Results

Descriptive Statistics depicts the makeup of the variables employed in the model. Table 2 below shows summaries of the sample and measures of the data used in the paper.

Table 2: Descriptive statistics

	GRR	ELC	GXE	GXH	IFR
Mean	4.203170	730.7980	154.3326	92.54093	19.51238
Median	4.230061	725.0092	76.50000	34.20000	12.55496
Maximum	15.32916	798.6300	593.4385	388.3671	72.83550
Minimum	-2.035119	671.9070	0.225005	0.041315	5.388008
Std. Dev.	3.961522	37.26194	181.3858	115.3454	17.82654
Skewness	0.472175	-0.035210	1.054648	1.147143	1.703080
Kurtosis	3.265910	1.638234	2.892593	3.140648	4.547383
Jarque-Bera	1.403653	2.711575	6.505140	7.705151	20.41130
Probability	0.495679	0.257744	0.038675	0.021225	0.000037
Sum	147.1109	25577.93	5401.641	3238.932	682.9332
Sum Sq. Dev.	533.5843	47207.37	1118627.	452355.4	10804.71
Observations	35	35	35	35	35

Authors Compilation using Eviews 10 (2022)

Table 2 showed descriptive statistics of the variables used in this study. The annual GDP growth rate (GRR) of Nigeria ranged from 15.33% to -2.04% an average of 4.20% in the period 1986 to 2020. The standard deviation of the country's annual GRR growth rate was 3.96. This suggested that there was a high variation in Nigeria's growth rate over the period. The skewness value of 0.47, and kurtosis value of 3.26, indicated that annual GDP growth rate data was skewed to the right and Mesokurtic, respectively.

The Mean, Median, Maximum and Minimum data as well as the Standard Deviation of all variables are given in Table 2 above. The results showed that all variables are positively skewed except for Electricity Consumption (ELC) which was negatively skewed. The results also revealed that GRR and government expenditure on health (GXH) were Mesokurtic given the

kurtosis value of approximately 3. Further, the results showed that ELC and Government expenditure on education (GXE) displayed platykurtic distribution while inflation had a leptokurtic distribution.

The Jarque-Bera as well as their respective probability value indicated GRR and ELC are normally distributed given a probability value of greater than 0.05, while GXE, GXH and inflation rate (IFR) were not normally distributed.

Correlation Analysis
Table 3: Correlation coefficient

	GRR	ELC	GXE	GXH	IFR
GRR	1				
ELC	0.12043	1			
GXE	-0.16187	0.82689	1		
GXH	-0.18525	0.80532	0.7892	1	
IFR	-0.31597	-0.43037	-0.363652	-0.345693	1

Authors Compilation using Eviews 10, (2022)

Table 3 provided Pearson's correlation matrix of the variables in the model. The results showed that the pairwise Pearson's correlation coefficients ranged from -0.161 to 0.827. This indicated that all the pairwise Pearson's correlation coefficients were less than 0.9. The implication is to expect an absence of multicollinearity among regressors in the estimated regression model. This supports the assumption of no multicollinearity in the estimated model.

Test for Stationarity
The stationarity test precedes any form of time series estimation.

Table 4: ADF unit root Test for Stationarity

Variables	Levels		First Difference		Remarks
	ADF Stats	5% Critical value	ADF Stats	5% Critical Value	
ELC	-1.446496	-2.951125	-5.201707	-2.954021	I(1)
GRR	-3.681611	-2.951125	-3.939693	-2.960411	I(0)
GXE	1.587072	-2.951125	-4.783273	-2.954021	I(1)
GXH	2.861015	-2.967767	-6.631389	-2.954021	I(1)
IFR	-4.539566	-2.976263	-2.640153	-2.981038	I(0)

Author's compilation using Eviews 10, (2022)

The unit root test in the table above using augmented Dickey Fuller shows that the variables (ELC, GXE, and GXH) were found to be stationary at first difference which implies they are I(1) variables while the variable IFR and GRR were found to be stationary at levels form indicative of I(0) variable. We, therefore, proceed to carry out Auto regressive distributed lag model estimation.

Auto regressive distributed lag Model
Table 5:   Optimal Lag criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-678.9508	NA	1.00e+13	44.12586	44.35715	44.20125
1	-599.7663	127.7170	3.12e+11	40.63008	42.01781*	41.08245
2	-577.5024	28.72758	4.26e+11	40.80661	43.35078	41.63594
3	-557.8510	19.01755	8.87e+11	41.15168	44.85229	42.35798
4	-493.6148	41.44267*	1.77e+11*	38.62031*	43.47737	40.20359*

Authors Compilation using Eviews, 10, (2022)

The optimal lag length for this model is 4. This is decided based on the recommendation of the Akaike information criterion (AIC).

Bounds Test for Cointegration
Table 6:   Bounds Test for Cointegration

F-Bounds Test		Null Hypothesis: No Level of relationship		
Test Statistics	Value	significance	I(0)	I(1)
			Asymptotic: n=1000	
F-Statistic	5.537967	10%	2.2	3.09
K	4	5%	2.56	3.49
		2.5%	2.88	3.87
		1%	3.29	4.37

Source: Authors compilation using Eviews 10, (2022)

From table 6 above, the F-statistics of 5.538 is greater than the critical values of 2.56 and 3.49 which represent the 5% significance level for the upper and lower bound respectively. We reject the null hypothesis of no levels of co-integrating relationship; hence, there is a long-run relationship between the endogenous and the exogenous variables in the model.

The ARDL estimation of this model (see appendix) recommends an ARDL (4, 2, 4, 3, and 4) model. The short-run error correction estimation is presented in table 7 below:

Table 7: Short Run Error Correction Result

Dependent Variable		GRR		
Variable	Coefficients	Std. Error	t-Statistics	Prob*
D(ELC)	0.167137	0.032339	5.168259	0.0006
D(ELC(-1))	-0.067836	0.028329	-2.394576	0.0403
D(GXE)	-0.069177	0.022741	-3.041916	0.0140
D(GXE(-1))	0.073134	0.014918	4.902450	0.0008
D(GXH)	0.065155	0.025157	2.589950	0.0292
D(GXH(-1))	-0.102915	0.017937	-5.737510	0.0003
D(IFR)	-0.209578	0.032533	-6.442054	0.0001
D(IFR(-1))	0.232467	0.038380	6.056938	0.0002
CointEq(-1)*	-0.672748	0.371762	-7.189415	0.0001
R-Squared	0.923764	Means Dependent Var		4.341822
Adjusted R Squared	0.836637	S.D dependent Var		4.081692
F-Statistics	4.479160	Durbin Watson		2.711648
Prob(F-Statistics)	0.012595			

Source: Authors Compilation using Eviews 10, (2022)

Table 7 provided the short-run result of the model based on the ARDL (4, 2, 4, 3, and 4) process selected. The coefficient of the error correction term (CointEq(-1) was negative (-0.672748) and significant at the 1 per cent level. This met with apriori expectation and indicated that about 67.28 per cent of the deviations of the model from its equilibrium value in the previous period were corrected in the current period. The model, therefore, converges to its equilibrium value over time.

The coefficient of determination is 0.924 while the adjusted R-squared is 0.837 when adjustments were made for the degree of freedom. This implies that 92.4 per cent of the variations in GRR was explained by all the explanatory variables (ELC, GXE, GXH and IFR). This is a good fit as only about 7.6 per cent of the systematic variation is left unexplained, captured by the error term in the model. The F-statistic (4.48) with a probability value of 0.013 indicated a statistical significance of the model at the 5% level which implies that the overall model is significant in explaining the variations in GRR.

Durbin Watson lacks the sufficiency to test for Autocorrelation due to the presence of lag of dependent variable among the explanatory variables. We will there for test for the presence of Autocorrelation in the model by employing the instrumentality of other methods as contained in the diagnostic test. Given the soundness of goodness of fit as analyzed above, we could thus rely on the estimated parameters of the variable.

The results showed that the estimated coefficient of Electricity Consumption (ELC) was positive and significant at the 5 per cent level of significance in its static form. It however had a negative coefficient in its one-period lag. The positive value of 0.167 indicated that a 10 per cent rise in ELC would translate to a 1.6 per cent rise GRR on average. Thus, there was a positive and significant relationship between ELC and GRR in Nigeria ascertained by the timeframe of the present study in Nigeria.

The estimated coefficient of GXE in the static form was negative and significant at the 1 per cent level while its one-period lag was positive and significant. The negative sign negates the apriori sign expectation. More specifically, the results indicated that a 10 per cent increase in GXE led to a 6 per cent decrease in GRR. This, therefore, suggested that there was a negative and significant relationship between GXE and GRR in Nigeria from 1986 to 2021.

Furthermore, the estimated coefficient of GXH was 0.065. This coefficient was significant at a 5 per cent level. On average, a 10 per cent increase in GXH led to a 6 per cent increase in GRR. This outcome suggested that GXH had a positive and significant impact on GRR and thus, economic growth in Nigeria over the period considered.

Lastly, the estimated coefficient of IFR was -0.2096 and it was found to have a significant impact on GRR in Nigeria even at the 1 per cent level. This value indicated that holding all other variables constant, a 10 per cent rise in IFR led to a 20 per cent rise in GRR. The results aligned with our apriori sign expectation of a negative relationship between IFR and GRR as posited by the literature.

Table 8: Estimated Long Run Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ELC	0.103604	0.015761	6.573244	0.0001
GXE	-0.076851	0.034355	-2.236990	0.0521
GXH	0.078874	0.052272	1.508925	0.1656
IFR	-0.127476	0.024370	-5.230792	0.0005
C	-65.03273	11.42300	-5.693137	0.0003

Source: Authors Compilation using Eviews 10, (2022)

The long-run result of the model is presented in Table 8. The estimated model showed that all the coefficients had the expected signs except government expenditure on education which was expected to have a positive impact on economic growth. The estimated coefficient of Electricity Consumption (ELC) was positive and significant at the 5 per cent level. Its coefficient value of 0.1036 implied, on average, a 10 per cent rise in ELC led to a 10 per cent rise in the real gross domestic product in the long run, in Nigeria. Therefore, a significant positive relationship is held between ELC and GRR within the period under study.

GXE had a negative coefficient significant at the 5 per cent level. Its coefficient value of -0.0769 showed that holding all other factors constant, a 10 per cent increase in GXE translates to a 7.69 per cent rise in GRR of Nigeria. This result revealed a significant negative relationship between GXE and GRR in the long run in Nigeria on the timeframe of the paper.

In addition, government expenditure on health (GXH) was found to have a non-significant impact on GRR in the long run. Its coefficient value of 0.0789 showed that there exists a positive but non-significant relationship between GXH with GRR in Nigeria in the long run.

Lastly, in the long run, result, the inflation rate (IFR) in Nigeria had a negative and significant impact on GRR in Nigeria; this is following the apriori sign expectation. The coefficient value -0.1275 indicated that, on average, a 10 per cent rise in IFR led to a 12.7 per cent fall in GRR in Nigeria.

Diagnostic Test

After the ARDL estimation, the test for autocorrelation and heteroscedasticity was carried out. The Breusch-Godfrey Test is used to test for autocorrelation above the Durbin-Watson statistics. Further, the normality test for the residual series was carried out using the Histogram and Jarque-Bera normality test. Finally, the stability of the model of estimation was examined using the CUSUM and the CUSUMQ test accordingly.

Autocorrelation
Table 9:   Breusch-Godfrey Serial Correlation LM Test:

F-statistic	6.195505	Prob. F(2,20)	0.6283
Obs*R-squared	19.80925	Prob. Chi-Square(2)	0.2340

Source: Authors Computation Using Eviews 10, (2022)

The test for serial correlation has its null hypothesis that there is no serial correlation in the residuals. The p-values of the chi-square distribution are greater than 0.05(5% critical value) we do not reject the null hypothesis of no serial correlation in the residuals for the model.

Test for Heteroskedasticity

Table 10:   Breusch-Pagan-Godfrey Heteroskedasticity Test

F-statistic	2.270487	Prob. F(11,22)	0.1026
Obs*R-squared	26.07765	Prob. Chi-Square(11)	0.2035
Scaled explained SS	1.955536	Prob. Chi-Square(11)	1.0000

Source: Authors Computation Using Eviews 10, (2022)

The test for heteroscedasticity carries a null hypothesis that there is homoscedasticity. From the table above, the p-values of the chi-square distribution are greater than 0.05(5% critical value) hence do not reject the null hypothesis of homoscedasticity for the estimated Model.

**Stability Test**

Figure 1: Stability Test
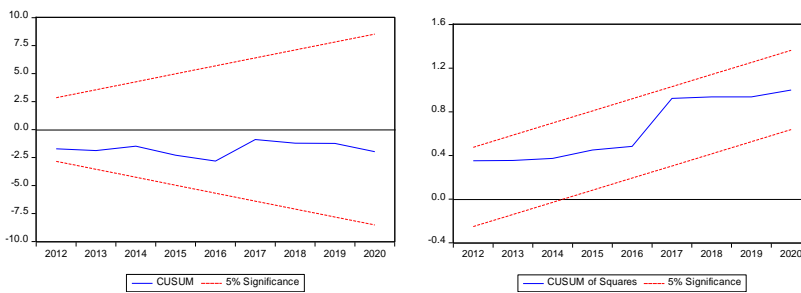
Source: Authors' computation (E-views 10.0), 2022

The Cumulative Sum (Cusum) and the cumulative Sum of square (CusumsQ) tests are employed to determine the appropriateness and stability of the model used. The result from our stability testing indicates the stability of our model both for the Cusum and CusumsQ of squares for our parameter estimates. Hence, the plot line stayed within the 5% critical bounds. We accept the null hypothesis of parameter stability at a 5% significance level.

Normality Test

Figure 2:   Histogram Normality Test
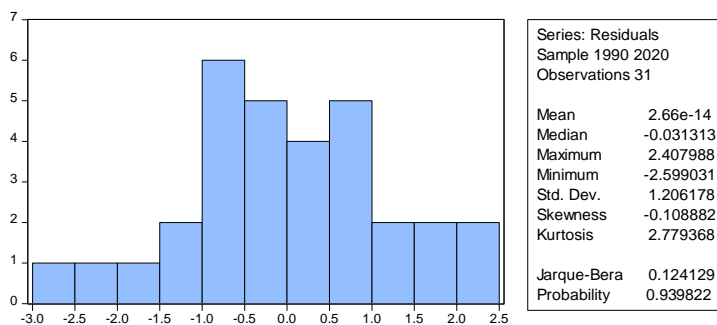
Source: Authors' computation (E-views 10.0), 2022

The Jarque-Bera value of 0.124 and its probability value of 0.93 (5% level of significance) indicates that the residual series maintained a normal distribution as shown above and thus, we accept the null hypothesis that the residual series are normally distributed. Further, the

histogram diagram maintained a bell shape indicative of a normal distribution of the residual series.

Discussion of Findings

From the results, government expenditure on education had a significant and negative impact on economic growth in Nigeria in both the short run and long run. This finding indicated that government expenditure on education significantly impeded economic growth in Nigeria in the short to long-run periods. The finding does not support the study by Itumeleng and Aye (2017) who found a positive and significant relationship between government expenditure on education and economic growth in South Africa. The study further negates the findings of Hardianti *et al* (2020) that found that government expenditure does not have a significant impact on economic growth in Indonesia.

The study established that government expenditure on health had a positive and significant impact on economic growth in the short run; however, its impact was non-significant in the long run. This implies that government expenditure on health promoted economic growth in the short run. The study supports the findings of Itumeleng and Aye (2017), and Hardianti *et al* (2020) that established that government expenditure on health had a significant impact on economic growth in their various studies.

Furthermore, the results showed that electricity consumption significantly and positively impacted economic growth in Nigeria. This result implied that electricity consumption spurred economic growth in Nigeria over the period considered in this study. The observation of the paper supports the findings of Hardianti *et al*, (2020), and Itumeleng *et al* (2017) that established that electricity consumption had a positive impact on economic growth.

Lastly, the study found that inflation had a negative and significant on economic growth in Nigeria within the timeframe of the study. The paper aligned with previous studies that correlated inflation and economic growth as negative, hence the paper observed that a strong negative relationship exists between these variables in Nigeria within the timeframe of the study both in the short-run and long-run basis and was statistically significant.

5.   Summary, conclusion and Recommendations

Social infrastructure is essential to the growth and development of any economic process. Both theoretical and empirical literature has established the nexus between social infrastructural development and economic growth. This paper therefore further explored the impact of social infrastructure on economic growth in Nigeria, based on the components of social infrastructure and extension of scope to fill the identified gaps in the existing literature.

The estimated results showed that government expenditure on education had a negative significant effect on economic growth in Nigeria in the short run and in the long run time horizons. Findings from the study also revealed that government expenditure on health had a significantly promoted economy in Nigeria in the short run period while its impact in the long run periods was found to be insignificant. Also, Electricity consumption had a positive and significant impact on economic growth in Nigeria in the short run as well as the long run. Finally, the inflation rate (controlled variable) was found to have a negative significant impact on economic growth in Nigeria both in the short run and the long run as given by the apriori sign expectation which also aligned with previous studies.

To achieve sustainable economic growth through social infrastructure, the paper proffers the following recommendations; the government should increase not just the amount of expenditure made on the education and health sectors, but also adopt the UNESCO percentage benchmark. Also, the government should boost electricity generation and distribution with the needed facilities. Finally, the rate of inflation should be well monitored to encourage investment in Nigeria.

In conclusion, social infrastructures are critical components needed for boosting the economic environment for economic well-being and overall economic development and growth in Nigeria both in the short-run and long-run basis as revealed in this paper and other studies now. Hence, the importance of the provision of social infrastructure, hard or soft, or physical by the government must be deliberately sustained by developing economies to achieve all-round sustainable development in the nearest future.

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STOCK MARKET DEVELOPMENT AND ECONOMIC GROWTH IN WEST AFRICA: A COMPARATIVE STUDY OF NIGERIA AND GHANA

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Abstract
The study carried out a comparative analysis of stock market development on economic growth in Nigeria and Ghana with data covering a period of (33) years from 1989 to 2021. The statistical tools used include, descriptive statistics, for the purpose of ascertaining normality of data distribution, Augmented Dickey Fuller (ADF) unit root test, co-integration test, ordinary least squares and the error correction methodologies. The outcomes of the study showed that stock market exerted positive but weak effects on economic growth in Nigeria and Ghana respectively. The results further showed that overall financial sector, and not stock market alone, led to significant economic growth in Nigeria. Finally, the results generally indicated that the stock market in Ghana and Nigeria were still at the emerging stages as the markets largely depended on their economies rather than their economies depending on their stock markets. Based on these findings, the study strongly recommends policymakers to promote polices that will gear total value of transaction towards enhancing the efficiency of stock market operations with a view to boosting domestic investment and jointly estimate the long run and short run effects of the stock market on real gross domestic product comparatively.

Keywords: Stock Market, Market Capitalization, Total Value of Transactions, All Share Index, Total number of Deals and Economic Growth.

JEL Codes: C58, E5, F3, G3, P34

1. INTRODUCTION

1.1 Background to the Study

All nations of the world strive to achieve sustainable economic growth on a long term basis. This desire is attributable to the fact that sustainable economic growth enhances the market size of a country thereby serving to project the economy as an investment destination country. Economic growth is the improvement in the ability to satisfy the desire and demand for goods and services, leading to improved production, innovation, and quality goods and services. Ughulu (2021) reported that the economic growth of any country depends on the growth of physical capital, human capital and progress in information technology. In this sense, economic growth enables a country to increase the production of goods and services with available stock of capital in conjunction with other factors of production within the economy.

One of the conspicuous examples of globalization is the ease with which capital moves around the world, especially to developing countries. Private capital flows to emerging markets have risen from $25 billion in 1990 to$300 billion by 2015 (Sharma, 2016). Part of this expansion in financial flows has been brought about by the growth of equity funds dedicated to investing in publicly and privately listed securities in developing countries.

An efficient stock market is essential for adequate capital formation and economic growth in any economy. The primary purpose of the Stock Market is to facilitate the movement of capital to be used more profitability and productively to boost the national income and economic growth. The capital market provides a medium of exchange where funds transfer can take place between individuals, firms and the government. Stock Market performs two significant functions of mobilizing resources from excess sources and making the funds accessible to deficit sources, thereby matching individual savers' needs with firms requiring funds and the resulting capital build up that leads to an increase in economic growth. The Stock Market is a technical and specialized financial market that stimulates economic growth because of its capacity to muster savings and investment (Anyanwu, 2006).

Stock markets have become an important conduit through which long-term finance can be raised. The antecedents to this arise from the fact that most African countries in the immediate post-independence era chose a state-sponsored route to development. The emphasis on state-led growth meant a relatively insignificant role being assigned to private enterprise. This phenomenon was compounded by the East-West confrontation, with most development aid flowing from the eastern bloc to Africa, largely to secure ideological partners. Following the end of the Cold War however, this door to economic development was shut, thus prompting a shift to market capitalism with its attendant stock markets.

The revitalization of the markets has also been motivated by the growing need to promote the role of the private sector in stimulating economic growth. Kolapo and Adaramola (2012) proposed that the two main channels of financial intermediation – banks and the stock market – should complement each other. Argues that credit markets need to be supplemented by well-functioning equity markets, since equity finance does not experience adverse selection and moral hazard problems to the same extent as debt finance does in the presence of asymmetric information. The existence of equity markets would thus enhance capital allocation and diversify investment risk.

The institutional framework through which the capital market functions in Nigeria include the Nigerian Securities and Exchange Commission (SEC), the Nigerian Stock Exchange (NSE), stock brokers and investors. The main objective of establishing the Nigerian Capital Market was to mobilize savings from numerous economic units in the country for economic growth and development; provide adequate liquidity to investors, and to broaden the ownership base of assets as well as the creation of a buoyant private sector. All such firms need to raise an appropriate mix of short and long-term capital market (Beck, Demirguc-Kunt, Levine, & Maksimovic, 2000). Most literature on capital market performance in recent times is unable to detail out the crucial role of capital market on economic growth empirically. In a nutshell, capital market is an organized financial market where long-term financial instrument or securities like bonds, shares and debentures are traded (bought and sold).

The stock market are the essential part of financial system that is concerned with raising capital by dealing in shares, bonds and other long-term financial instruments or investments. It's a market in which long term debt (over a year) or equity backed securities are bought and sold,

it helps to channel the wealth of savers to those who can put it to long term productive use, such as company or government making long term investments. Stock market consist the primary market where new securities are issued and sold, while the secondary market is where already issued securities are traded between investors. Hence, this study investigates the impact of stock market on economic growth in Nigeria and Ghana.

1.2   Statement of the Research Problem

Previous studies have examined the relationship between stock market and economic growth. While some studies revealed negative association between stock market and economic growth, others showed a positive connection between stock market development and economic growth. The study by Adebiyi and Akinbohungbe (2016) and Owusu (2016) reveal a positive relationship between stock and economic growth. On the other hand, the study by Osinubi and Amaghionyeodiwe (2018), using Cote d' Ivoire, Ghana and Nigeria data, affirm that stock market development has no significant impact on economic growth in Cote d' Ivoire, Ghana and Nigeria during the period of 1989 to 2018. According to the study, the Cote d' Ivoire, Ghana and the Nigeria stock market was unable to make significant contribution to rapid economic growth because if the existence of certain policies that distort the effectiveness of the channel through which stock market activities influence economic growth.

Chijoke and Ogbuagu (2014) opined that theoretical and empirical research have given little emphasis on the nature of stock market operation and economic growth bearing in mind the recent downturn in the stock market and how it affects the real sector of the economy. This have generated a lot of controversies and further research needs to be carried out on the nature of relationship between the stock market in relation to economic growth in the countries under study.

The importance of stock market lies in its financial intermediation capacity and process to link the deficit sector with the surplus sector of the economy. The absence of such capacity robs the economy of investment and production of goods and services for societal advancement. Funds could thereby be idle at one end, while being sought at the other end in pursuit of socio-economic growth and development (Adebiyi & Akinbohungbe, 2016). Ariyo and Adelegan (2015) posit that, the liberalization of capital market contributed to the growth of the Nigeria capital market, yet its impact at the macro-level is quite negligible.

The current realities existing in most of the stock markets in Africa today have created some significant gaps in the debate on the impact of stock market on economic growth. In the case of Ghana and Nigeria, for instance, the market has declined very rapidly as a result of the global recession that affected the financial system of these three West African Countries. The activities of investors engaging in capital flight and profit taking on the stock markets could impact on the economy over time with instability of the markets. The study of Ghana and Nigeria stock markets is justifiable based on the fluctuating market capitalization and movements in the key market indicators such as value of traded securities, all-share index and number of deals. With this scenario, there is a need to establish its empirical connection with economic growth. Indeed, this is the gap the current study seeks to fill.

The broad objective of this research investigated the effect of Stock Market on economic growth in Nigeria and Ghana, while the specific objectives are to:

  i.   Examine the impact of market capitalization on the economic growth in Nigeria and Ghana;

ii.   Determine empirically the effect of total value of transactions on the economic growth in Nigeria and Ghana;
iii. Ascertain the impact of all-share index on the economic growth in Nigeria and Ghana;
iv.   Evaluate the impact of total number of deals on economic growth in Nigeria and Ghana.

This study is guided with the following research questions.
i.   To what extent has market capitalization influenced economic growth in Nigeria and Ghana?
ii.   What is the effect of total value of transaction on economic growth in Nigeria and Ghana?
iii. Does all-share index has influence on economic growth in Nigeria and Ghana?
iv.   Does total number of deals have impact on economic growth in Nigeria and Ghana?

The hypotheses guiding this study are:
H_{01}:   Market capitalization has no significant influence on the economic growth in Nigeria and Ghana.
H_{02}:   Total value of transactions has no significant effect on the economic growth in Nigeria and Ghana.
H_{03}:   All-shares index has no significant effect on the economic growth in Nigeria and Ghana.
H_{04}:   Total Number of Deals has no significant impact on Economic Growth in Nigeria and Ghana.

This study examined the effect of stock market on economic growth comparatively, covering a time series period of 33 years (1989 – 2021).

2.   Literature Review

2.1   Theoretical Review

There have been several theories on the impact of stock market on economic growth in Nigeria and Ghana. Some of them are reviewed below:

(a)   Endogenous Growth Theory

This theory and empirical paper such as (Ross, Levine, and Kunt, 1996) have recommended that stock market development affect economic growth in developing countries such as Ghana and Nigeria. It has been a challenge in markets to stimulates economic growth in these stated countries. The growth rate is a positive function of exogenous technical progress. However, financial development is not related to economic growth, but to physical capital per worker (Pagano, 1993). On the other hand, endogenous growth models show that economic growth performance is related to financial development, technology and income distribution. King and Levine (1993) argued that income per capita helps determine membership in an information processing intermediacy that in turn improves investment decisions and economic growth. They incorporated the role of financial factors in models of endogenous growth to formalize the interactions between financial markets and economic growth. Due to the advances in the endogenous growth literature, recent models have been trying to identify the mechanism through which financial markets influence economic growth. Various channels have been suggested, firstly, financial markets can affect economic growth through efficient resource allocation. King and Levine (1993) proposed a model in which innovation activities serve as

the engine of growth. A higher rate of successful innovations results in a higher growth rate of productivity.

In the absence of financial markets, one might invest in projects that can be promptly liquidated, instead of investing in assets that are more productive but financially illiquid. Markets can provide individuals with less risky and liquid productive investments. Secondly, financial markets can influence economic growth through the information channel. For example, (Bengt and Jean, 1993) argue that stock markets function as a monitor of managerial performance because the stock price incorporates performance information that cannot be extracted from a firm's current or future data. In the short run, growth is determined by moving to the new steady state which is created only from the change in the capital investment, labor force growth and depreciation rate. The change in the capital investment is from the change in the savings rate. The Cobb-Douglas production function denoted as $F(K, L) = K^a L^{1-a}$ means that the output (the quantity produced) is a function of the inputs capital (K) and labor (**L**) and the marginal product of capital is the ratio of capital income to output (that is, GDP). However, economic growth is affected by labor in terms of average hours worked per worker to output and the quality of the labor force (that is, human capital). More so, growth comes through capital stock in terms of investment in the physical stock, growth in capital stock and composition of the physical capital. Technology also affects both human and physical capital.

(b)　　Efficient Market Theory
Efficient market theory, reviews the relationship between stock market and economic growth between Cote d'Ivoire, Ghana and Nigeria. It holds that a security's price reflects all relevant and known information about that asset. One upshot of this theory is that, on a risk-adjusted basis, you can't consistently beat the market. The theory, which is controversial, has significant implications for investment strategy.

Efficient market theory holds that markets operate efficiently because at any given time, all publicly known information is factored into the price of any given asset. This means that an investor can't get ahead of the market by trading on new information because every other trader is doing the same thing.

It's important to note that efficient market theory doesn't argue that the market will get things right at any specific moment. Markets can overvalue or undervalue an asset. It argues, instead, that the market will get things right over time. If an asset strays too far from its value, the market will eventually correct that mistake.

Eugene Fama developed the efficient Market Theory in 1960. Efficient market theory states that asset prices reflect all available information. A direct implication is that it is impossible to beat the market consistently on a risk-adjusted basis since market prices should only react to new information. The efficient market theory also states that share prices reflect all information and consistent alpha generation is impossible. According to the efficient market theory, stocks always trade at their fair value on exchange, making it impossible for investors to purchase undervalued stocks or sell stock for inflated prices. Therefore, it would be impossible to outperform the overall market through expert stock selection or marketing timing and the only way an investor can obtain higher returns is by purchasing riskier investments. The Efficient Market Hypothesis is an efficient market theory, which states that share prices fully reveal all available information regarding all stocks in the market. This implies that it is near impractical to overrun the market constantly under a risk adjusted criterion**.** This is because market prices are anticipated to react to new information only.

(c)   Rational Expectations Theory

The rational expectations theory states that the players in an economy will act in a way that conforms to what can logically be expected in the future. That is, a person will invest, spend, etc. according to what they rationally believe will happen in the future. By doing so, that person creates a self-fulfilling prophecy that helps bring about the future event.

Although this theory has become quite important to economics, its utility is doubtful. For example, an investor thinks a stock is going to go up, and by buying it, this act actually causes the stock to go up. This same transaction can be framed outside of rational expectations theory. An investor notices that a stock is undervalued, buys it, and watches as other investors notice the same thing, thus pushing the price up to its proper market value. This highlights the main problem with rational expectations theory: It can be changed to explain everything, but it tells us nothing.

Most macroeconomists today use rational expectations as an assumption in their analysis of policies. When thinking about the effects of economic policy, the assumption is that people will do their best to work out the implications. The rational expectations approach is often used to test the accuracy of inflation. Inflation is an economic concept that refers to increases in the price level of goods over a set period of time. The rise in the price level signifies that the currency in a given economy loses purchasing power (i.e., less can be bought with the same amount of money) forecasts. For example, P^e_t is an individual's forecast in year t-1 of the price level in year t. The actual price level is denoted by P_t. The difference between the actual price level and the individual's forecast is the forecast error for year t.

$P_t - P^e_t = r_t$ is the individual's forecast error in year t. With rational expectations, the forecast errors are due to unpredictable numbers. However, if people systematically under-predict or over-predict numbers, the price level expectations are not rational.

Under rational expectations, what happens today depends on the expectations of what will happen in the future. But what happens in the future also depends on what happens today. Many macroeconomic principles today are created with the assumption of rational expectations.

The theory is also used by many new Keynesian economists because it fits well with their assumption that people want to pursue their own self-interest. If people's expectations were not rational, the economic decisions of individuals would not be as good as they are.

2.2   Empirical Review

There have been several studies purporting to examine the impact of stock market on economic growth. Some of them are reviewed below:

In the study: stock market development in Sub-Saharan Africa, Yartey & Adjasi (2007) examined the causal relationship and the direction of causality between stock market development and economic growth in Ghana, Kenya and Nigeria using the Granger Causality test procedure. The study regressed five indicators of stock market namely stock market capitalization (MC), stock turnover ratio (STO), stock traded value (TVL), number of listed securities (LS), and stock market index (MI) on the real gross domestic product (GDP) which is used as a proxy for economic growth for the period 1989 – 2009. The empirical findings of the study show that there is no causal relationship between stock market development and economic growth in Ghana and Nigeria, but revealed a bi-directional causal relationship between stock market development and economic growth in Kenya. When MC was used as a

proxy for stock market development, MC and LS were found to Granger cause economic growth. Bi-directional causality was found between STO and GDP. TVL was found to have a strong negative effect on GDP. Based on the results of the study, it was recommend that policy makers should formulate and implement policies that will attract investors and avail the real sector of the economy the much needed fund for production and encourage listing of companies that contribute largely to GDP in the nation stock exchange.

Maku and Atanda (2009) conducted a study on whether macroeconomic indicators exert shock on the Nigerian stock market for the period 1984 to 2007 employing the Vector error correlation method (VECM). The study used five macroeconomic variables to observe the shock on share return. The variables are consumer price index, broad money supply (M2), Treasury bill rate, exchange rate and real output growth. The result suggested that Nigerian Stock Exchange all share index is responsible to change in exchange rate broad money supply, inflation rate, and real output.

Ujunwa and salami (2010) used ordinary least square technique to observe the relationship between the stock market and economic growth in Ghana. The study employed annual time series data from 1986 to 2006. Value of the share traded, rate of turnover and market capitalization ratio were used to represent the stock market development variables while the dependent variable is represented by per capita gross domestic product. The result shows that market capitalization and rate of turnover are positively associated with economic growth. While the stock market liquidity is negatively correlated with economic growth.

Onaolapo and Adebayo (2010) used an ordinary least square regression analysis to examine the effect of the bond market and the growth of the economy from the periods 1984–2008. The results show that the indicator of bond market size (government stock market capitalization) and that of liquidity (value of government stock traded) are significant determinants of economic growth in Nigeria.

Osinubi (2012) examined whether the stock market promotes economic growth in Nigeria. The study used ordinary least squares regression (OLS) from 1980 to 2000 by employing production function approach to develop the model. The variables used in the analysis include stock market index, which consists of market capitalization ratio, new issue and value of transaction ratio. Other variables are gross capital formation, public capital expenditure, trade openness, debt ratio and dummy variables relate to political stability and policy adjustment program. The result of the study showed that there is a positive correlation between the measures of stock market and long-term economic growth. Maduka and Onwuka (2013) investigate both long run and the short-run relationship between financial structure and economic growth using annual time series data. They use a vector error correction model in the analysis. The result reveals that the Nigerian financial structure has negative and significant effect on the rate of economic growth. The study, therefore, recommend for sound financial policies in place that will encourage the growth of per capita GDP.

Ogboi and Oladipo (2012) examined stock market and economic growth nexus in Nigerian context. The study specifically examines the relationship between stock market development and economic growth in Nigeria. They employed econometric techniques of error correction model (ECM) and Granger causality test approach. They used variable such as gross domestic product, market capitalization, value of the total transaction, new issues and bank total. The result shows that there is unidirectional causality between the stock market and economic growth which runs from economic growth to stock market.

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Atoyebi, Ishola, Kadiri, Adekunjo, Ogundeji (2013) investigated the effect of stock market on financial growth in Nigeria using yearly information from 1981 to 2010. A normal least square test was utilized to confirm the measurable significance of the factors utilized and vector auto regression method to decide the long run relationship inside the factors of study. Exact investigations uncovered that two factors are genuinely significant at 10% and these factors are market file and market capitalization. It was prescribed that there is need to re-establish certainty to the market by regulatory specialists through ensuring transparency and reasonable trading in the stock exchange.

Oluwatosin, Adekanye and Yusuf (2013) used data from the central bank of Nigeria from 1999 to 2012 to investigate the impact of capital market and economic growth in Nigeria. Ordinary least square method of analysis was employed. The result showed that all capital market variables can jointly predict economic growth, but at an insignificant rate. The value of the total transaction is a significant independent predictor of economic growth. However, the result further shows that market capitalization and number of listed companies have a negative impact. Thus, they do not make an independent impact on economic growth. The study concluded that there is potential growth in the Nigerian capital market, but the market failed to do so because of low market capitalization, low absorptive capitalization, illiquidity and miss use of funds among others.

Okonkwo, Ogwuru and Ajudua (2014) examined the impact of stock market development on economic growth in Nigeria, Ghana and Cote d'Ivoire using data from 1981 to 2012. The study started its analysis with stationary test of augmented Dickey-Fuller. The error correction estimate shows that the market capitalization and value of turnover ratio are all statistically significant. While the total value of the transaction is negatively significant. The VECM Granger causality revealed that there is unidirectional causality from listed securities to real GDP. A bi-directional causality runs from the ratio of the total traded stock to market capitalization ratio. The study suggests that the stock market can positively increase economic growth if enabled environment for enlisting companies is created.

Yadirichukwu and Chigbu (2014) examined the impact of capital market on economic growth in Nigeria, Ghana and Cote d'Ivoire. The study used annual time series data from 1985 to 2012. They utilized regression analysis where multivariate and error correction is used to observe four formulated hypotheses. The result shows that there is an inverse relationship between the stock market capitalization ratio and long-run economic growth. This is statistically significant. However, a long run relationship is observed between value of total the transaction and economic growth. The authors recommend that to improve investor's confidence, efficiency, and transparency, the favorable macroeconomic environment should be achieved.

Adamu and Sanni (2015), examine the roles of the stock market on Nigeria's economic growth, using Granger-causality test and regression analysis. They discovered a one-way causality between GDP growth and market turnover. They also observed a positive and significant relationship between GPD growth and market turnover ratios. The authors advised that government should encourage the development of capital market since it has a positive effect on economic growth.

Amu, Nwezeaku and Akujuobi (2015) evaluated the impact of growth in capital market on economic growth in Nigeria using regression analysis on annual data from 1981 to 2012. The statistical tool employed was least square regression. The results showed that growth in market capitalisation does not have significant impact on the economy in Nigeria. It is therefore

recommended that capital market regulatory authorities should put in place polices that will enhance and sustain the market's contribution to economic development.

Nkwede, Uguru, Nkwegu (2016) analysed the macroeconomic variables that determine bond market development for the periods 1980–2013. The study employed descriptive and ordinary least square estimation techniques. The results revealed that corporate bond market development was influenced by economic variables such as exchange rate, savings, inflation rate, banking sector development, interest rate, fiscal balance, bond yield and foreign direct investment. It was also revealed that from these economic variables savings and exchange tends to be more significant than other macroeconomic factors within the period under review.

Ewah, Essang and Bassey (2018) appraised the impact of capital market efficiency on economic growth in Nigeria, using time series data on Capitalization, Money Supply, Interest Rate, Total Transaction and Government Development Stock that ranges between2000 - 2017. The result of the study shows that the capital market in Nigeria has the potential of growth inducing; but it has not contributed meaningfully to the economic growth of Nigeria. The study attributed the findings to the low market capitalization, low absorptive capitalization, liquidity, misappropriation of funds among others, short term loans or credits Financing long-term projects and corruption in the highest order.

Briggs (2019) empirically examined the impact of the capital market on the Nigeria economy from 1981-2011. The study used Gross Domestic product (GDP) as proxy for economic growth while the capital market variables considered were; Market capitalization (MCAP), total new issues (TNI), value of transactions (VLT), and total Listed Equities and government stocks (LEGS). Johansen co-integration and Granger causality tests were applied. The result showed the clear relative positive impact the capital market plays on the economic growth and invariably on the economy.

Emeh and Chigbu (2020) examined the impact of capital market on economic growth in Nigeria. The study adopts a time-series research design relying extensively on secondary data covering 1985-2012. The study utilizes regression analysis as data analysis method incorporating multivariate co-integration and error correction to examine characteristics of time series data adopting disaggregate the capital market indices approach. Observation across studies on this subject is the heterogeneity in empirical findings over what may be termed a considerably uniform theoretical framework at least with regards to causality. The finding suggests that two exhibit positive while two exhibit inverse and statistically significant relationship with economic growth. This could stimulate dialogue on the implication for policy simulation. The recommendation is that relevant regulatory agencies should focus on enhancing efficiency and transparency of market to improve investor's confidence.

3.   Methodology

3.1   Introduction
This Section embodies on the overall research plan and design guiding the process of data collection and collation for this study.

3.2   Sources of Data
The study employed secondary data source. The secondary data is obtained from World Bank Data Atlas or Financial Development 2021.

3.3   Method of Data Analysis

The statistical tools used for the study includes; descriptive statistics for the purpose of ascertaining normality of the data for regression, Augmented Dickey Fuller (ADF) Unit Roots Tests, and Error Correction Model (ECM).

3.4 Model Specification

In this model, economic growth is proxied with Real Gross Domestic Product (RGDP) as the dependent variable, while stock market is proxied with Market Capitalization (MCAP), Total Value of Transaction (TVT), All Shares Index (ASI) and Total Number of Deals (TND) as the independent variables. The model for the study can be expressed in functional form as:

$$RGDP = f\,(MCAP,\ TVT,\ ASI,\ TND) \qquad\qquad (3.1)$$

The econometrics model for the study is set explicitly as:

$$RGDP_i = \beta_0 + \beta_1\,MCAP_i + \beta_2\,TVT_i + \beta_3 ASI_i + \beta_4 TND_i + \mu_{it} \qquad (3.2)$$

Where; RGDP = Real Gross Domestic Products; M.CAP = Market Capitalization; TVT = Total Value of Transaction on Stock Exchange; ASI = All Shares Index; TND = Total Number of Deals; μ_t = Stochastic disturbance.

Apriori Expectation: $\beta_1>0$; $\beta_2>0$; $\beta_3>0$; $\beta_4>0$.

4.   Data Presentation and Interpretation

4.1   Unit Root Tests

Prior to estimating the specified models, the variables were tested for unit root to determine their stationarity or time series properties. An essence of this test was *inter alia* to determine an appropriate method for the analysis. The results of the test are presented in Table 4.1.

Table 4.1: Unit Root Test Results for Nigeria and Ghana

ADF Unit Root Test Results for Nigeria							
	Levels			First Difference			d
	t-stat.	Critical value (5%)	Remark	t-stat.	Critical Value (5%)	Remark	
RGDP	-1.70	-3.56	NS	-4.21	-3.56	S	1
MCAP	-2.98	-3.56	NS	-5.94	-3.56	S	1
TVT	-2.67	-3.56	NS	-5.58	-3.57	S	1
ASI	-2.81	-3.59	NS	-5.01	-3.61	S	1
TND	-1.35	-3.56	NS	-5.52	-3.56	S	1

ADF Unit Root Test Results for Ghana							
	Levels			First Difference			d
	t-stat.	Critical value (5%)	Remark	t-stat.	Critical Value (5%)	Remark	
RGDP	-1.64	-3.56	NS	-6.73	-3.56	S	1
MCAP	-1.65	-3.56	NS	-6.73	-3.56	S	1
TVT	-0.90	-3.57	NS	-8.35	-3.57	S	1
ASI	-3.94	-3.56	S	-	-	-	0
TND	-1.33	-3.56	NS	-3.17	-2.96	S	1

Key: NS = Non-stationary; S = Stationary
Source: Regression Results from E-Views version 9.0 (2021)

The outcomes of the ADF and the DF-GLS unit root tests reveals that the variables are of mixed order of integration. For Nigeria, all the variables of interest were stationary after first difference. All Share index (ASI) was stationary at levels while all other variables were first difference stationary in the case of Ghana. In spite of the fact that some of the variables are mean-diverging, that is they are not stationary at level, there exists the possibility that a linear combination of all the variables will be stationary. This implies that there is the tendency for them to be cointegrated, to converge in the long run.

4.2   Co-integration Test

In view of the observation that the variables are integrated of different order (0, 1), the appropriate method to test for long run relationship (or cointegration) between the variables is the ARDL approach to cointegration, also referred to as the bounds testing approach. The results of the test is presented in Table 4.6 and 4.7.

The co-integration test result shows that long run relationship exists between the dependent variable and the explanatory variables. This is indicated by the computed F-statistic of 4.07, 4.32 and 5.70 which is greater than the upper bounds critical values at the conventional (5%) level of statistical significance for Nigeria. According to the Granger Representation Theorem, existence of long run relationship between variables imply that the short run (dynamic) relationship between them can be represented with an error correction model.

Cointegration Test (ARDL Bounds Test) Results
Table 4.2: Co-integration Test (ARDL
Bounds Test) Results for Nigeria

Sample: 1991 2019
Included observations: 27
Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k
F-statistic	4.07	4

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	2.45	3.52
5%	2.86	4.01
2.5%	3.25	4.49
1%	3.74	5.06

K = Number of explanatory variables
Source: Regression Results from E-Views version 9.0 (2021)

Table 4.3: Co-integration Test (ARDL Bounds Test) Results for Ghana

Sample: 1991 2019
Included observations: 28
Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k
F-statistic	4.32	4

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	2.45	3.52
5%	2.86	4.01
2.5%	3.25	4.49
1%	3.74	5.06

K = Number of explanatory variables
Source: Regression Results from E-Views version 9.0 (2021)

The co-integration test result shows that long run relationship exists between the dependent variable and the explanatory variables. This is indicated by the computed F-statistic of 4.07, 4.32 and 5.70 which is greater than the upper bounds critical values at the conventional (5%) level of statistical significance for Ghana. According to the Granger Representation Theorem, existence of long run relationship between variables imply that the short run (dynamic) relationship between them can be represented with an error correction model.

4.3 Model Estimation Results
The results of estimation of the specified short-run (error correction) and the long-run models are presented in Tables 4.4 and 4.5.

Table 4.4: Estimation Results for Nigeria
ARDL Cointegrating And Long Run Form
Dependent Variable: RGDP
Selected Model: ARDL(1, 2, 2, 1, 2)
Date: 09/24/21   Time: 12:55
Sample: 1989 2020
Included observations: 27

Cointegrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(MCAP)	5.392865	1.219679	4.421545	0.0006
D(MCAP(-1))	1.594884	1.095233	1.456205	0.1674
D(TVT)	-14.241411	4.186413	-3.401817	0.0043
D(TVT(-1))	-5.847947	3.490521	-1.675379	0.1160
D(ASI)	-0.005684	0.002233	-2.545706	0.0233
D(TND)	-2.822106	1.202217	-2.347417	0.0341
D(TND(-1))	-3.061227	1.676361	-1.826114	0.0892
CointEq(-1)	-0.661061	0.199736	-3.309672	0.0052

Cointeq = RGDP - (5.4295*MCAP -18.2313*TVT + 0.0048*ASI -1.3323 *TND+ 332.6498)

Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
MCAP	5.429454	1.507239	3.602251	0.0029
TVT	-18.231313	6.824992	-2.671258	0.0183
ASI	0.004752	0.001755	2.707627	0.0170
TND	-1.332310	0.998353	-1.334508	0.2033
C	332.649797	184.920004	1.798885	0.0936

Source: Regression Results from E-Views version 9.0 (2021)

For Nigeria, the co-integrating form (that is the error correction model) shows that the contemporaneous effect of market capitalization (MCAP), total value of transactions (TVT), all share index (ASI) and total number of deals (TND) on real gross domestic product is statistically significant in the short run. However, TVT ASI and TND adversely affect economic growth. The short run effect of market capitalization on real gross domestic product is positive and significant at the 1% level. This is consonance with Adajaski and Biekpe (2005). They established that market capitalization has positive influence on stock market development and economic growth. A unit rise in market capitalization is associated with a 5.39-unit increase in real GDP in the short run. The error correction coefficient is negatively signed as expected and significant at the 1% level. The absolute value of the coefficient indicates that about 66.1% of the short run deviation from equilibrium is adjusted annually to restore equilibrium in Nigeria.

Just like in the short run, the long run effects of market capitalization, total value of transactions and all share index on economic growth are also statistically significant at the conventional levels. Contrary to the observed negative short run effect of all share index on real gross domestic product, the long run effect is positive and significant at the 1% level. Specifically, a unit rise in the all share index will lead to 0.0047-unit increase in real gross domestic product. This is in sync with the findings from the studies by Maku and Atanda (2009).

Table 4.5: Estimation Results Ghana

Cointegrating And Long Run Form
ent Variable: RGDP
d Model: ARDL(1, 0, 2, 0, 2)
9/23/21   Time: 15:04
: 1989 2020
Included observations: 28

Cointegrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(MCAP)	2.932692	1.133814	2.586573	0.0186
D(TVT)	11.037626	10.868938	1.015520	0.3233
D(TVT(-1))	-67.189960	13.309029	-5.048449	0.0001
D(ASI)	0.000025	0.000446	0.056046	0.9559
D(TND)	-0.064229	0.573591	-0.111977	0.9121
D(TND(-1))	-1.631424	0.563538	-2.894965	0.0096
CointEq(-1)	-0.392454	0.103540	-3.790356	0.0013

Cointeq = RGDP - (7.4727*MCAP + 87.1792*TVT + 0.0001*ASI + 1.6689 *TND -31.3370)

Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
MCAP	7.472697	2.040216	3.662699	0.0018
TVT	87.179205	50.006547	1.743356	0.0983
ASI	0.000064	0.001143	0.055694	0.9562
TND	1.668853	0.631285	2.643580	0.0165
C	-31.336991	11.448412	-2.737235	0.0135

Source: Regression Results from E-Views version 9.0 (2021)

For the model explaining the relationship between the stock market and economic growth in Ghana, market capitalization is positive and contemporaneously affect real gross domestic product in the short run and statistically significant at the 1% level. The short run effect of total value of transactions (TVT), all share index (ASI) and total number of deals (TND) is not statistically significant. However, total value of transactions (TVT) and total number of deals (TND) adversely affect economic growth only after a period

of time has elapsed. A unit rise in TVT(-1) and TND(-1) implies that economic growth decreases by 67.19 units and 1.63 units respectively. The error correction term (ECT) meets the apriori expectation as expected and significant at the 1% level. The absolute value of the coefficient indicates that 39.2% of the short run deviation from equilibrium is adjusted annually to restore the equilibrium in Ghana.

The estimated long run coefficients for the Ghana equation reveal that real gross domestic product is affected by same variables affecting it in the short run, namely, market capitalization, total value of transactions and total number of deals. Market capitalization and total number of deals positively affect real gross domestic product in the long run and the effect is significant at the 1% level while total value of transactions is statistically significant at the 10 % level. Thus market capitalization and the total number of deals are key determinants of economic growth in the long run. This observed positive effect of the total number of deals on economic growth while the observed positive effect of market capitalization is in sync with Ewah, Esang and Bassey (2009). A unit rise in market capitalization and total number of deals is associated with 7.47 units and 1.67 units rise in real gross domestic product respectively in the long run. This again underscores the relevance of the stock market as a key determinant of economic growth. Just like in the short run, all share index is not a significant factor in explaining the stock market.

4.4   Model Diagnostics Tests

4.4.1 Serial Correlation Test
This test was conducted to ascertain whether the residuals of the underlying ARDL model are correlated or not. The problem of autocorrelation introduces some bias into the coefficients of the estimated parameters, thus rendering them unreliable. The result of the test is presented in Tables 4.6 and 4.7.

Breusch-Godfrey Serial Correlation LM Test Results

Table 4.6: Breusch-Godfrey Serial Correlation LM Test: Nigeria

F-statistic	1.722758	Prob. F(2,12)	0.2199
Obs*R-squared	6.023037	Prob. Chi-Square(2)	0.0492

Table 4.7: Breusch-Godfrey Serial Correlation LM Test: Ghana

F-statistic	0.061253	Prob. F(2,16)	0.9408
Obs*R-squared	0.212758	Prob. Chi-Square(2)	0.8991

Source: Regression Results from E-Views version 9.0 (2021)

The p-value of the F-statistic of the B-G-serial correlation tests fails to reject the null hypothesis of "no serial correlation" at the 5% level for the various models. On the basis of this test result it can be inferred that there is no problem of serial correlation in the models.

4.4.2. Heteroskedasticity Test

This was conducted to test the constancy of the variances of the regression residuals. The Breusch-Godfrey-Pagan (B-G-P) test was adopted for this. The result of the test is presented in Table 4.8 and 4.9.

B-P-G Test for Heteroskedasticity

Table 4.8: Heteroskedasticity Test: Breusch-Pagan-Godfrey for Nigeria

F-statistic	2.923320	Prob. F(12,14)	0.0295
Obs*R-squared	19.29826	Prob. Chi-Square(12)	0.0816
Scaled explained SS	5.428419	Prob. Chi-Square(12)	0.9421

Table 4.9: Heteroskedasticity Test: Breusch-Pagan-Godfrey: Ghana

F-statistic	1.933255	Prob. F(9,18)	0.1118
Obs*R-squared	13.76243	Prob. Chi-Square(9)	0.1310
Scaled explained SS	5.996814	Prob. Chi-Square(9)	0.7402

Source: Regression Results from E-Views version 9.0 (2021)

The null hypothesis of no heteroskedasticity is accepted at the 5% level, as the p-value of the F-statistic is greater than 0.05 for the various models. Thus the model is not plagued by problem of heteroskedasticity.

4.5 Test of Hypotheses

The hypotheses formulated for the study are tested in this sub-section. The t-ratios of the estimated coefficients of the long run model are be used to test the hypotheses. The tests are conducted at the 5% significance level.

Hypothesis one: Market capitalization has no significant influence on the economic growth of Nigeria and Ghana.

This null hypothesis is rejected by the t-ratio of the coefficient of the associated variable (MCAP) in the long run model for Nigeria and Ghana at the 5% level. Thus, market capitalization affects economic growth in Nigeria and Ghana in the long run.

Hypothesis Two: Total value of transactions has no significant effect on the economic growth of Nigeria and Ghana.

The t-ratio of the estimated coefficient of TVT fails the test of statistical significance at the 5% level for Ghana. Thus the null hypothesis cannot be rejected. We do not have sufficient evidence to claim that total value of transactions influence economic growth in the long run. The case is different for Nigeria where the t-ratio of the estimated coefficient of TVT passes the significance test at the 5% level. Thus, we can infer that the total value of transactions does affect economic growth in the country in the long run.

Hypothesis Three: All-shares index has no significant effect on the economic growth of Nigeria and Ghana.

The t-ratio of the coefficient of ASI passes test of statistical significance at the 5% level for Nigeria, thereby rejecting the null hypothesis. Therefore it can be inferred that economic growth is affected by all share index in the long run in Nigeria. For Ghana, the

t-ratio of the estimated coefficient of TVT fails the test of statistical significance at the 5% level. Hence, the null hypothesis cannot be rejected.

Hypothesis Four: Total Number of Deals has no significant impact on Economic Growth of Nigeria and Ghana.
Evidence from this study fails to show that the total number of deals impact economic growth in the long run in Nigeria since the hypothesis is rejected at the chosen significance level. However, this is not the case for Ghana where the t-ratio of the estimated coefficient of TND passes the significance test at the 5% level. Thus, we can infer that the total number of deals does affect economic growth in the country in the long run.

5.0   Summary, Conclusion and Recommendations
5.1   Summary and Conclusion
The study examined the empirical relationship between the stock market and real gross domestic product in Nigeria and Ghana. In doing this, real gross domestic product was regressed on market capitalization, total value of transactions, all share index and total number of deals, by employing the ARDL bounds test approach to cointegration and error correction for analysis of annual time series data spanning the period from 1989 to 2020. The study found that the stock market contributes significantly to economic growth in both countries under investigation. This is not unexpected considering that they are both developing country which relies on the stock market which constitutes significant portion of the country's economic growth.

Policymakers should consider reducing barriers to liquidity in the stock market, enhancing awareness to potential investors and stimulating their confidence in the market, encouraging saving among low-income households and stimulating small and medium companies to participate in the stock market.

These result shows that it is theoretically as well as empirically possible that stock market development increases economic growth. In addition to this, financial policy is seen as an important tool not only for the more efficient transfer of funds but also for growing economies, so stock market performance on economy have become a central instrument of financial policies in emerging countries.

5.2 Recommendations
In light of the empirical evidence of the study, the following recommendations are made:
i.   The observed positive effect of market capitalization on real gross domestic in Nigeria and Ghana, this suggests that the stock markets are crucial for economic growth by providing services to the non-financial economy. Thus, investing in the stock market of these economies promotes the possibilities for this mechanism to increase economic growth. High levels of market capitalization yields higher levels of growth than those with very low market capitalization.

ii.   Nigeria and Ghana have over the years mobilized huge financial resources in their total value of transaction from their stock markets to support both public and private sector investment projects. Owing to the fact that stock markets have proven to be valuable sources for the financing of long-term investment projects in these countries, it is pertinent for policymakers to promote polices that will

gear total value of transaction towards enhancing the efficiency of stock market operations with a view to boosting domestic investment.

iii.   There is urgent needs or call as for the formulation of financial reforms programs that will boost all share index of stock market through the facilitation of foreign participation.

iv.   It will be pertinent for policymakers in these countries to encourage the sustainability of total number of deals of stock markets operations in Nigeria and Ghana by encouraging governments' interventions during periods of severe financial crisis.

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CREDIT AVAILABILITY TO PRIVATE SECTOR: EFFECT ON UNEMPLOYMENT GROWTH RATE IN NIGERIA

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Abstract
This study was carried out to examine the effects of bank credit to the private sector on unemployment in Nigeria utilizing annual data for 31 years 1991-2021. The study employs the autoregressive distributed lag (ARDL) bounds testing approach to cointegration. The result shows a long-run relationship between unemployment and credit to the private sector, commercial banks' lending rate, total private sector savings, and inflation rate. Financial deepening proxied by the ratio of private sector credit to national income has a negative relationship with the unemployment growth rate. This implies that an improvement in credit availability to the private sector can drag growth in the unemployment rate southward. Furthermore, it reveals that despite the long-run relationship, the variables are statistically not significant in determining the magnitude and direction of the unemployment growth rate. The study reveals monetary policy measures are not effective in regulating the rate of unemployment. Hence, it is recommended that Policies targeted at affecting unemployment must be driven more by fiscal measures than monetary measures.

Key Words: unemployment rate, credit to private sector, total savings, money supply.

JEL Codes: C32, C58, E51, L32

1.0 Introduction

Unemployment, like inflation, is a symptom of basic economic illness and macroeconomic disequilibrium. With appropriate diagnosis, necessary fiscal and monetary policy prescriptions are advanced by the government or its agencies to manage or reduce the level. Macroeconomic policies of any nation are summarily targeted at improving the welfare of individuals and reduction of poverty levels. The key success factor to attaining this is an expansion of the economy through increased aggregate demand and supply. An increase in aggregate demand will invariably result in the call for factor inputs which include land, labour, capital, raw materials, technology etc. It,

therefore, implies that an increase in aggregate demand will translate to an increase in demand for the labour needed in direct activities, research, technology development, and other entrepreneurial functions. Developed nations experience and are known for very low unemployment rates, improved welfare, and efficient capacity utilization of the nation's resources. The reverse is the case for developing or low-income economies like Nigeria.

In Nigeria, the reduction of unemployment remains a major policy target. To achieve this, credit policies, income policies, and other direct measures are employed to regulate monetary variables. Despite these measures, unemployment has remained unabated.
The unemployment rate in Nigeria is alarming and worrisome. Unemployment arises from a situation where people who are willing and capable of working are unable to find suitable paid employment (Fajana, 2000). Further in his work, Fajana posit that, the higher the rate of unemployment in an economy, the higher the level of poverty and associated welfare challenges. The Nigerian situation is worrisome because Nigeria is blessed with energy resources that include oil, natural gas, coal, biomass, sun (solar), wind and heavy water bodies among others. Despite these huge endowments, Nigeria is also an energy deficient country whose economy suffers tremendously from the shortage of energy supply (Iwayemi, 2008). The above is a clear case of inefficient resource allocation and utilization. The Incessant fuel scarcity and near zero electricity supply resulted in a double-edged energy crisis in Nigeria. This led to massive loss of jobs resulting from failure and eventual closure of many companies such as Dunlop Nig., Eternit Nig. Ltd., Michellin Ltd., and others.

The problem of unemployment in Nigeria both now and in the past years has been an issue of great concern to economists, policy makers, economic managers, individuals, government and many others. The 2020 survey report from NBS shows that the underemployment rate saw an increase of 28.6%. This implies that 28% of the labor force works less than 20 hours a week hence classified as underpaid. Added together, both the unemployment and underemployment rate are capped at an astounding 55.7%.

International Labour Organization in 2016 ranking shows that the unemployment rate of people above 15 years old was 30.70%. In the past three decades, successive governments in Nigeria have made futile attempts to address the issues of unemployment. While Nigeria economic growth is at a very slow pace, growth in population is faster with increased number of youth and children population. This challenge of unemployment, growth in population with the attendant social challenges made the government of Buhari to embark on small business and social support such as trader money, conditional cash transfer to indigent and the aged citizens etc.

Capital acquisition and financing is said to be the heart of any business activity. Production and productive ventures are dependent on both external and internal sources for raising capital funds for production activities. Domestic bank credit such as loans, purchases of non-equity securities, and so on; remains the major external source with which businesses are found to fulfill the need for financial resources. In order to flourish as a private sector in the economy, the provision of funds by credit institutions is of great importance in relieving the budgetary constraints of businesses and meeting the financial requirements of investors. A credit system well managed can aid resource reallocation

by transferring surplus funds of individuals and institutions to the deficit spenders, encourage savings and investment, promote more efficient allocation of financial resources, and strengthen economic and commercial growth in a country.

The Central Bank of Nigeria (CBN) has over the years rolled out different monetary policies to ensure that the financial sector in Nigeria maintains liquidity and solvency with a view to competing effectively within the global financial market. The reforms are in response to the challenges posed by developments in the system as a result of systemic crisis, globalization, technological innovation and financial crisis. The world over, various studies centered on the nexus of financial/capital market and economic growth have been carried out. This is because of the fact that the bulk of funds mobilized by the financial sector is channeled for economic growth. Considering the fact that policy pronouncements by any nation is targeted at welfare and employment generation there is, therefore, a need to evaluate the eventual relevance of such policies in improving the welfare of the people through active engagement and employment creation. This study, therefore, peeps into the efficacy of credit intervention on welfare improvement. The link between bank credit to the private sector and unemploymentt in Nigeria, therefore, becomes the primary focus of this investigation. The study used Ratio of private sector credit to GDP to proxy financial intermediation while the unemployment growth rate was used as a measure for change in employment and welfare improvement.

The CBN on a monthly basis presents the economic outlook dissecting the previous performance of the economy and the efficacy of their policy measures. Based on that, new monetary policy pronouncements and new targets are set. The lending rate, inflation rate, and liquidity ratio are monitored and regulated to enhance the quantity and quality of credit. These policy measures have over the years not resulted in a substantial reduction in unemployment. The financial sector crisis and very low private sector lending have dampened the economy snowballing into a loss of jobs and high unemployment. NBS (2022) report reveals 133 million Nigerians are poor. One hundred and thirty-three million Nigerians accounting for 63% of the population are poor. This is contained in the 2022 Nigeria Multidimensional poverty index report. The 63 percent of Nigerians were considered poor due to a lack of access to health, education, living standards, employment, and security,

The growth in unemployment has over the years been attributed to some macroeconomic variables such as inflation, population explosion, exchange rate, money supply, and external debt service and government expenditure. The dramatic shift in the structure of the Nigerian economy and dependence; on Agriculture to the Oil sector has resulted in a major loss of jobs and means of livelihood in Nigeria. Though revenue and national earnings from the oil sector increased loss of jobs become imminent as the petroleum sector which could employ only a few became more attractive, migration to urban sectors increased while the agricultural sector predominantly in the rural areas suffered a great loss of manpower. In recent times, the contribution of agriculture to GDP in Nigeria has increased but this has not been reflected in the absorption of the teeming population of unemployed youth.

Successive government in Nigeria has developed different policies to correct this structural defect. Creating employment opportunities is crucial for economic

development and poverty reduction but most important is identifying the proximate cause and solution of unemployment. Despite all policies, intervention mechanisms, and programmes by the government to increase employment levels, the unemployment rate is still rising at an alarming rate (NBS 2021). The government has engaged in different forms of conditional cash transfer to improve the welfare of the masses and to encourage small-scale enterprises which is expected to increase employment windows. This also did not translate to increase employment as most of these palliative measures either end up for direct consumption or did not get to the supposed beneficiaries who would have used the same for investment and employment generation. Arguably, loans to the private sector and private sector savings remain a sure and direct source of funding and investment for the expansion of the private sector and the economy. Based on the above, there is a need to investigate the relationship between governments, private sector financial intermediation controlled by monetary policy variables, and unemployment in Nigeria.

The broad goal of this study is to examine the relationship between some selected monetary policy variables such as inflation, credit to the private sector, Total private sector savings, Commercial Banks lending rate, and unemployment growth rate in Nigeria. Specifically, the study offers novel insights on the empirical relevance of private sector credit to unemployment dynamics at the aggregate level, spanning the period 1991–2021. The main contribution lies in investigating the impact of shifts along two dimensions. First of all, by providing a direct measure of the extent to which contractions or expansions in private-sector credit affect total and long-term unemployment. Secondly, the study tests the hypothesis that an improvement in financial intermediation may not result in an improvement in the unemployment rate in the same period. Hence the time path to adjustment remains the primary focus of this investigation.

2.0 Literature Review

2.1 Conceptual Review
Unemployment: Unemployment refers to the population that is actively prepared and seeking a job. It also includes people who are in the workforce but in the wrong job or unsatisfied with their current job. It is usually measured by the unemployment rate obtained by dividing the total unemployed by the total number of the workforce. Unemployment is a key indicator/measure of economic strength. Appropriate reward to labor is a measure of maximized efficiency in labour market. An unemployed workforce depicts both unproductive and a drain on society's resources.

The Bureau of Labor Statistics (BLS) specifically defines unemployed persons as those who don't have a job but are available for work and have looked for work in the past four weeks. Unemployment on a national level is caused by a slowing economy. Unemployment may be caused by high-interest rates, global recession, and financial crisis. It could also result from frictional and or structural changes in the economy.

Unemployment can be classified and caused by factors such as the strength of the economy, length of joblessness, and workplace changes. Unemployment caused by variation in the number of unemployed workers during cycles of economic strength and weakness is referred to as cyclical unemployment. Unemployment is said to be frictional

when people resign voluntarily and remain unemployed until they are able to secure another job.

Structural unemployment occurs when there is a fundamental change in the economy such as evolving technology, government policies, and competition. This means that while jobs are available, the people who could fill those roles either don't have the right skills for them or aren't in the right location. The combination of frictional and structural unemployment is referred to as natural unemployment. It is the lowest unemployment level a healthy economy can sustain without causing inflation. This type of unemployment is ever-present: People are always voluntarily looking for new jobs, causing frictional unemployment, and job skill requirements are always evolving, causing structural unemployment. The BLS classifies people as long-term unemployed if they have remained unemployed for 27 weeks or more and actively sought employment in the past four weeks. Other forms of unemployment include seasonal changes (seasonal unemployment) or hikes in real wages which result to the classical type of unemployment.

Private sector: The private sector is that part of the economy that is owned and run by individuals mainly for for-profit purposes. It makes up for the largest share of the economy in a free market system. It could be a small or large corporate institution, multinational, professional, or trade union. An organized financial system with an energetic private sector is an important driver of growth, employment creation, and poverty reduction. Finance is central to private sector development and vice versa. The private sector in Nigeria majorly consists of micro and small and medium-scale businesses that depend on self-financing or savings of the proprietors and loans and advances to survive. Credit availability to the private sector is therefore considered vital to the survival, expansion, and sustenance of the sector.

Monetary and Credit Policy: Monetary policy constitutes the major policy trust of the government in realization of various macroeconomic objectives. It essentially consists of combination of discretionary measures designed to regulate and control money supply and credit in the economy. Monetary policy as a tool of economic stabilization was given impetus by Milton Friedman who held that "only money matters" as such, monetary policy is a more potent instrument of stabilization than fiscal policy. The monetarists emphasize the role of money in explaining short term changes in national income. It ensures that capital resources are available for increased productivity. The policy thus creates an environment for sustaining faster development and economic growth.

The monetary authorities such use both the Portfolio constraint and money market intervention mechanisms. These techniques are referred to as quantitative and qualitative methods respectively. The portfolio constraint are direct mechanisms which tend to control the ability of banks to create money thus limit their freedom to acquire earning assets (loans). The instruments include special deposits, selective credit control, administered interest rates, moral suasion and other direct measures. The market intervention techniques rely on the power of the monetary authorities to influence volume, availability and rate of return of financial assets through market mechanism. This affects the capability of banking system to create credit, willingness to source for

deposit and the desire of the public to hold more balances and to generally invest. The ultimate result is to improve the welfare of the people and reduce unemployment.

2.2   Theoretical Reviews

The relationship between credit to the private sector and unemployment is a complex issue, and various theoretical and conceptual frameworks have been proposed to explain their interdependence. Here are some perspectives on this issue:

1. Keynesian Theory: According to Keynesian economics, an increase in credit to the private sector can boost economic growth, increase business investment, and create job opportunities, leading to a decrease in unemployment. This is because the injection of credit into the economy can stimulate consumer spending and business expansion, resulting in an increase in demand for labor. Conversely, a decrease in credit availability can cause a decrease in business investment and aggregate demand, leading to a rise in unemployment.

2. Monetarist Theory: On the other hand, monetarist economics suggests that credit expansion can lead to inflation, which can then lead to higher interest rates and a decrease in private-sector investment. In this scenario, the resulting decrease in economic growth can lead to an increase in unemployment. According to monetarists, maintaining low inflation is key to promoting economic growth and reducing unemployment in the long run.

3. The Structuralists Theory: From a structural perspective, unemployment can be caused by a mismatch between the skills and qualifications of the labor force and the available job opportunities. In this case, increasing credit to the private sector may not necessarily lead to a reduction in unemployment if the available jobs do not match the skills of the labor force. This type of unemployment is generally considered more difficult to address through monetary policy, as it requires structural changes in the economy, such as retraining programs and education reform.

4. Financial Crisis Theory: In times of financial crisis, credit to the private sector can have a significant impact on unemployment. During a crisis, banks may reduce lending to businesses, leading to a decrease in investment and job creation. This can cause a cycle of lower demand, lower economic growth, and higher unemployment. In this scenario, government intervention, such as through fiscal stimulus packages or direct investment, may be necessary to boost economic activity and job creation.

The impact of credit to the private sector on unemployment is multifaceted and depends on various economic, structural, and policy factors. While an increase in credit availability can lead to economic growth and job creation in some scenarios, it may not necessarily be effective in addressing all types of unemployment.

2.3   Empirical review of related literature:

Economists always and of all ages have expressed various degrees of concern over the threat of the monster called unemployment. The population of every economy is divided into two categories, the economically active and the economically inactive. The

economically active population or working population refers to the population that is willing and able to work, including those actively engaged in the production of goods and services (employed) and those who are unemployed (Njoku & Ihugba, 2011) as cited by Aiyedogbon & Ohwofasa, 2012 in their work entitled "Poverty and youth Unemployment in Nigeria, 1987-2011".

Below is a review of some recent related empirical literature on the relationship between credit to the private sector and unemployment growth in Nigeria.Uddin & Uddin (2013) looked into the causes, effects, and solutions to youth unemployment problems in Nigeria. They identified six causes and six effects of unemployment in Nigeria among youths which according to them include but are not limited to Boko Haram, high population growth rate, Militantancy, armed robbery, prostitution, and child trafficking. They suggest heavy investment on education to enable the youth to become self-reliant job creators and employers of labour through skills development and training. Unemployment has been identified by various scholars as is a major challenge confronting most economies. This study did not in any way recognize the effect of the paucity of investable funds as a cause of unemployment and productivity in Nigeria. Their study was purely descriptive in nature

Akinboade and Ogunrinola (2021) in their work titled, Credit and Unemployment Nexus in Nigeria: Evidence from ARDL-Bounds Testing Approach using Nigerian time series data from 1981 to 2019. In their findings, they conclude that There is a negative long-run relationship between credit to the private sector and unemployment in Nigeria. The authors recommend that the government should increase access to credit by small and medium-sized enterprises to create more job opportunities.

Yilanci and Atasoy (2020) titled, The causal relationship between credit growth and Unemployment in Turkey. They investigated the Turkish economic data from 2003 to 2018 using Granger causality and impulse response function to determine the relationship. The study reveals a unidirectional causality from credit growth to unemployment in Turkey. The authors recommend that policymakers should implement measures to increase credit growth to stimulate job creation and economic growth.

Hjortsoe & Weale (2020), in their work titled; The Interdependence of Credit and labor market fluctuations. Vector autoregression (VAR) and sign restrictions were used to analyze UK data from 1981 to 2018. The authors find evidence of a positive feedback loop between credit and labour market fluctuations, with credit shocks causing changes in unemployment and unemployment shocks leading to changes in credit growth. They recommend that policymakers consider the interactions between credit and labour markets in their policy decisions.

Onyeoma (2020) examined the influence of rising population on Poverty and Unemployment in Nigeria using Autoregressive Distributed Lag Bounds (ARDL) approach on annual data from 1980-2018. The dynamic relationship between population growth and selected macroeconomic variables of economic growth, poverty, and unemployment and the direction of causality between them was examined. It was recommended that governments and NGOs should sensitize the public impact of uncontrolled population growth and provide better policies to encourage investment and

saving with an enabling environment that will help curb the high fertility rate, thus leading to a decline in dependency ratio and poverty.

Ayoade & Agwu (2016) investigated the past intervention efforts made by the Nigerian government in addressing the problems of unemployment in the country and their effectiveness at encouraging entrepreneurship sense in the country with a view to facilitating job creation for the teaming Nigerians job seekers. The study revealed that several intervention programmes introduced by successive governments in the country had failed to produce the expected results and the reasons identified for the failure was largely the issue of corruptions and bureaucratic redtapism vis-à-vis inconsistencies in government policies, political instability and lack of entrepreneurial skill by majority of unemployed Nigerians. The study recommend that government should encourage entrepreneurship by providing an enabling environment with infrastructures coupled with the introduction of relevant entrepreneurial educational programmes in all institutions of learning; graduates should be provided with zero interest startup loans. The studies above provide evidence for the relationship between credit to the private sector and unemployment in different countries and time periods. They suggest that policymakers should consider the interdependence of credit and labor market fluctuations and implement measures to increase credit access and growth to stimulate job creation and economic growth.

Basher, Haug, & Sadorsky (2012), they carry out a study on Oil prices, exchange rates, and emerging stock markets using data from 18 emerging markets from 1988 to 2010. The Autoregressive distributed lag (ARDL) bounds testing approach was used and they saw evidence of a negative relationship between credit to the private sector and unemployment in emerging markets. They suggest that policymakers should promote financial development to increase access to credit and stimulate job creation.

Ogbonna, Okoye & Ogbonna (2018) in their study titled; Credit Expansion and Employment Generation in Nigeria. Time series data from 1981 to was analyzed using Vector autoregression (VAR) and impulse response function. The authors find evidence of a positive relationship between credit expansion and employment generation in Nigeria, with credit expansion leading to a reduction in unemployment. They recommend that policymakers should focus on improving credit availability and accessibility to stimulate job creation.

Gencer (2014), carried out an investigation on the relationship between private-sector credit and employment in Turkey. Turkish data from 1998 to 2012 was employed using Johansen cointegration analysis and vector error correction model (VECM). The author finds evidence of a long-run relationship between private sector credit and employment in Turkey, with credit expansion leading to a reduction in unemployment. The study recommends that policymakers should increase credit availability to small and medium-sized enterprises to stimulate job creation.

Ubong, Polycarp & Udofia (2022) empirically investigated the influence of private-sector credit on unemployment in Nigeria between 1990 and 2020 using ARDL to ascertain the long-run and short-run effects. The result reveals that private-sector credit affects unemployment in the long run and an increase in private-sector credit could help

stimulate productivity and increase employment. These studies provide further evidence for the relationship between credit to the private sector and unemployment, particularly in emerging markets such as Nigeria and Turkey. They suggest that policymakers should focus on promoting financial development and improving credit availability to stimulate job creation and economic growth.

Gaps in literature:
Theoretical and empirical evidence from studies, clearly shows that most studies concentrated on the fusion of fiscal and monetary variables in examining the effect of credit and other macroeconomic variables on unemployment. All strategies employed by any government in improving a lot of people through employment creation target availability and provision of investable funds expected to be channeled into productive activities that can create employment. Investigation of the monetary policy impact on financial intermediation via credit availability to the private sector has not been totally carried out using only monetary variables. Hence, this study will use purely monetary variables to ascertain the relevance of private sector credit and monetary policy on the magnitude and direction of unemployment growth in Nigeria for the period of 31 years 1991 to 2021.

3.0   Methodology

3.1   Theoretical framework
To study the relationship between credit availability to the private sector and the unemployment growth rate in Nigeria, a framework drawn from financial intermediation theory was adopted:
This theory suggests that financial institutions play a crucial role in allocating credit to different economic sectors, including the private sector. The theory posits that increased credit availability to the private sector could lead to increased investment and job creation, thereby reducing the unemployment rate. The empirical procedure for this study is based on the assumed relationship between monetary policy variables especially credit to private sector (CPSR) and Unemployment in Nigeria. Improved financial intermediation proxied by credit to the Private sector may stimulate production and hence lead to an increase in employment in the subsequent year. Conversely, a southward movement in private sector funding may dampen production which will invariably lead to the loss of jobs and unemployment growth.

This inquiry employed the use of the Auto Regressive Distributed Lag (ARDL) technique to ascertain the magnitude and direction of the relationship between credit availability to the private sector and growth in unemployment in Nigeria. The data used covered the period 31years (1991-2021) data extracted from the Central Bank of Nigeria, Statistical Bulletin (2021), Nigerian Bureau of Statistics, world bank development World Development Indicators (WDI), and EViews version 9 was used to analyze the data gathered.

3.1   Model Specification
To investigate the impact of financial intermediation and monetary policy on unemployment in Nigeria, a model of unemployment growth as a function of financial support to the private sector (proxied by Credit to the private sector as a ratio of gross

national income) and some other control monetary policy variables were formed. The control variables for this study, which also cause variations to unemployment (UMR) other than Credit to the Private Sector (CPSR) alone, are Total Private Sector Savings (TS), Commercial Bank Lending Rate (LR), and Inflation rate (INF).
The model to aid the investigation is detailed below.

$$UMR_t = (CPSR_t, LR_t, INF_t, TS_t) \quad - \quad - \quad - \quad - \quad - \quad (1)$$

The above equation is transformed into an explicit form to comprise the stochastic term and is stated as below.

$$UMR_T = \beta_0 + \beta_1 CPSR_t + \beta_2 LR_t, + \beta_3 INF + \beta_4 TS_t + \varepsilon_t \quad - \quad - \, - \, - \, - \quad (2)$$

Where:

UMR: Growth Rate of Unemployment
CPSR: Credit to Private sector (ratio of GDP)
LR: Commercial Bank lending rate
INF: Inflation rate.
TS: Total Private Sector savings
ε_t: Stochastic Error Term
Subscript t: an estimated period of time i.e., 1991 to 2021

Furthermore,
$\beta 0$ represents the intercept of the regression function
β_1, β_2, β_3 and β_4 are parameters to be estimated.
Equation 3.2 was transformed to include a natural logarithm which will reduce the likely presence of heteroscedasticity in the estimation. It is presented as follows:

$$lnUMR_T = \beta_0 + \beta_1 lnCPSR_t + \beta_2 lnLR_t, + \beta 3 lnINF_{t\,+} \beta 4 lnTS_t + \varepsilon_t \quad - \quad (3)$$

ADF Unit Root test
The ADF unit root test is conducted using the constant and trend assumption, where the model is specified as a random walk model with drift and deterministic time trend as follows:

$$\Delta y_t = \varphi + \delta_t + \beta 1 y_{t-1} + \sum_{i=1}^{p} \Delta yt - 1 + \varepsilon t \text{ - - - - - - - - - - - - (4)}$$

Where yt is the time series variables to be tested for unit root (in this case we have UNMP, CPSR, INF, TS, and LR); p captures the lag length; t measures the time trend, φ is the constant (drift); $\beta 1$ is the parameter to be subjected to the test where the null hypothesis is stated as β_1=1; Δ is the difference operator; and the summation component of the model captures the augmented aspect of the model where its importance is to correct for any form of serial correlation.

Error Correction Model
The error correction model which will aid in our estimation of the short-run and long-run estimates of our model is specified thus;

$$\Delta UNMP_t = \tau_0 + \sigma_i X_i + \Sigma \varphi_i \Delta UNMP_{t-i} ni = 1 + \Sigma \rho i \Delta Xt - imi = 0 + \delta ECMt - 1 + \epsilon t \text{ - - - - - (5)}$$

Here, Xi represents all the explanatory variables in in the model (CPSR, LR, TS, and INT), n is the optimal lag length of the dependent variables while m captures that of the explanatory variables. The parameter σi denotes the long-run estimates of the model's parameters, φi and ρi represents the short-run parameters, δ measures the speed of adjustment of the short-run disequilibrium to attain long-run equilibrium, and ECM is the error correction mechanism expressed as the one-period lag of the residual.

Estimation Procedure and Post-estimation:

ARDL technique based on the bounds testing approach to cointegration, developed by Pesaran et al. (2001) was adopted. One major advantage of this technique is the fact that it can be applied in the estimation process irrespective of whether the series is either purely I(0) or I(1) or mutually integrated, and suitable for studies with small sample size (Latif et al., 2015). The ARDL method usually proceeds in two stages. In the first stage, the cointegration test (bounds test) is carried out. The second stage involves the estimation of the long-run and the short-run coefficients of the specified equations (Pesaran et al., 2001; Narayan, 2005). Ramsey RESET was adopted to test for the stability of the model.

4.0   Presentation of Result and Interpretation
4.1   Pre-estimation Result
Table 1: Descriptive Statistics

	UMR	CPSR	INF	LR	TS
Mean	4.8690	10.3725	18.6240	24.4021	5,920.4464
Median	4.0000	9.8808	12.0000	22.8800	1,739.6369
Maximum	9.7900	19.6256	76.7589	36.0900	25,648.2649
Minimum	3.7000	5.2411	0.2236	18.3625	37.7382
Std. Dev.	1.9311	3.4162	17.1213	4.4427	7,347.6274
Skewness	1.6854	0.9555	2.1658	0.6873	1.1619
Kurtosis	4.1203	3.6504	6.7944	2.7256	3.2934
Jarque-Bera	16.2980	5.2634	42.8326	2.5378	7.0862
Probability	0.0003	0.0720	0.0000	0.2811	0.0289
Sum	150.9400	321.5477	577.3438	756.4654	183,533.8380
Sum Sq. Dev.	111.8759	350.1196	8,794.2130	592.1291	1,619,628,871.2492
Observations	31.0000	31.0000	31.0000	31.0000	31.0000

Source: Authors Computation from EViews 9 application

The annualized summary statistics is reported above. All the series average growth rates display high level of consistency as their mean and median values are perpetually within the minimum and maximum values of these series. Moreover, the relatively low standard deviations for most of the series indicate that the deviations of actual data from their mean values are very small. Private sector savings has standard deviation greater than the mean value. This indicates that the mean value is not a true representation of the series. All series except Lending rate are leptokurtic (peaked) relative to the normal as kurtosis of this series exceeds three. Again, all the series show evidence of positive skewness which indicate a continuous positive growth in all the series over time. The very high standard deviation coupled with positive skewness for inflation shows that inflation has been increasing at a very fast pace compared to the growth in credit to private sector and other variables. The Jarque-Bera test is a goodness-of-fit test that determines whether or not sample data have skewness and kurtosis that matches a normal

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distribution. The test statistic of the Jarque-Bera test is always a positive number and if it's far from zero, it indicates that the sample data do not have a normal distribution. The series above shows only Lending rate and Credit to private sector has a distribution close to normal.

Table 2: Correlation result: Correlation Coefficients

	UMR	CPSR	INF	LR	TS
UMR	1.0000				
CPSR	0.1966	1.0000			
INF	(0.0884)	(0.3227)	1.0000		
LR	0.5167	(0.0115)	0.1970	1.0000	
TS	**0.8767**	**0.4689**	**(0.2692)**	**0.4468**	**1.0000**

Source: Authors Computation from EViews 9 application

In other to examine the background behavioral pattern in the data series, an ordinary unconditional correlation analysis is carried out. The correlation coefficients matrix shows the level of association between different variables used in the study. The correlation analysis above shows average levels of positive association between growth in credit to private sector, growth in total private savings and Unemployment except inflation which shows a negative association with unemployment. In terms of magnitude, many of the series has low values. It has a fair distribution in the relationship between the dependent variables and the independent variable UMR. All the explanatory variables have a positive relationship with Unemployment rate except inflation which has a negative relationship.

The correlation matrix as shown looks interesting. There is need to exercise care with the use of correlation matrix. This is because they cannot provide a reliable indicator of association in a manner which controls for additional explanatory variables. This study therefore proceeded further to use multivariate analysis by applying ADF to test for unit root.

4.2 Unit Root Test
The test for stationarity enables us to determine comparatively the unit root amongst the time series. It was conducted in the study to ensure that the data used are applicable in the implementation. The Augmented Dickey-Fuller(ADF) was employed to analyze the unit root.

Table 3: Augmented Dickey-Fuller Unit Root Test at Levels

Variable	ADF t-Stat Value	Critical Values			Remarks
		1%	5%	10%	
UMR	1.292	-3.670	-2.964	-2.621	NOT STAT
CPSR	-2.679	-3.679	-2.967	-2.623	NOT STAT
LR	-3.197	-3.670	-2.963	-2.621	STAT
INF	-7.725	-3.699	-2.976	-2.627	STAT
TS	7.977	-3.670	-2.963	-2.621	STAT

Source: Authors Computation from EViews 9 application

For a variable to be stationary, the value of the ADF t-Stat Value must be greater than the 5% Critical Values. Table Lending rate (LR), Inflation rate (INF), and Total private sector savings(TS) are stationary at levels. In Table 4 below, the Unit Root Test and Order of Integration results at first difference shows that at 5% levels, employment growth rate and Credit to private sector are stationary at first difference while Commercial Banks Lending rate, Total Private Sector savings and inflation was stationary at levels.

Table 4: Augmented Dickey-Fuller Unit Root Test at First Difference

Variable	ADF t-Stat Value	Critical Values			Remarks	Order of Integration
		1%	5%	10%		
UMR	-4.375	-3.679	-2.968	-2.623	STAT	1(1)
CPSR	-4.121	-3.689	-2.971	-2.625	STAT	1(1)
LR	-7.044	-3.679	-2.967	-2.622	STAT	1(0)
INF						1(0)
TS						1(0)

Source: Authors Computation from EViews 9 application

4.3   Test for Cointegration

With the result of the unit root test with different orders of stationarity, there is need to test for the possibility of long-run cointegration. It is appropriate to utilize the autoregressive distributed lag (ARDL) bounds testing approach to cointegration (levels relationship). The result is as detailed below. F-statistic is used as a reference for acceptance or rejection of the null hypothesis of "no levels relationship".

Table 5: ARDL BOUNDS TEST FOR LONG RUN RELATIONSHIP

ARDL Bounds Test		
Null Hypothesis: No long-run relationships exist		
Test Statistic	Value	K
F-statistic	9.13255283	4
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.45	3.52
5%	2.86	4.01
2.50%	3.25	4.49
1%	3.74	5.06

Source: Authors Computation from EViews 9 application

The above critical F value (9.133) is greater than the upper bound even at the 1% level. Hence there is the presence of a long-run relationship among variables used in the model. The null hypothesis of no log run relationship is therefore rejected. There is a long-run relationship between unemployment and the predictor variables. This made it necessary to estimate ARDL for long-run and short-run relationships.

Table 6: ARDL Model Result
Dependent Variable: UMR

Method: ARDL				
Maximum dependent lags: 4 (Automatic selection)				
Model selection method: Akaike info criterion (AIC)				
Selected Model: ARDL(4, 3, 4, 4, 3)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
UMR(-1)	1.477944234	0.22534078	6.558707246	0.002795*
UMR(-2)	-1.77177484	0.29977469	-5.910355033	0.004102
UMR(-3)	1.554502023	0.28458984	5.46225406	0.005462
UMR(-4)	-1.135637895	0.28756972	-3.949087225	0.016831
CPSR	-0.147455111	0.07236648	-2.037616057	0.111245
CPSR(-1)	0.228480143	0.0541324	4.220765171	0.013469*
CPSR(-2)	-0.014822632	0.05230614	-0.283382258	0.790946
CPSR(-3)	-0.081318622	0.07730332	-1.051942221	0.352176
INF	0.031388085	0.0136971	2.29158642	0.083711
INF(-1)	-0.001598023	0.01207948	-0.132292394	0.901141
INF(-2)	0.001284813	0.01109513	0.115799705	0.913392
INF(-3)	-0.041590692	0.01413946	-2.941462768	0.042327
INF(-4)	0.035473768	0.01471169	2.411263639	0.073454
LR	-0.050628208	0.02742071	-1.846349312	0.138575
LR(-1)	0.039729362	0.03387035	1.172983452	0.305886
LR(-2)	0.044207618	0.04785823	0.923720197	0.40791
LR(-3)	-0.008356137	0.05307675	-0.157434998	0.88253
LR(-4)	0.135603541	0.04462423	3.038787392	0.038448*
TS	0.001073494	0.00023654	4.538310228	0.010511*
TS(-1)	-0.002239231	0.0003614	-6.195947837	0.00345
TS(-2)	0.001664662	0.00030859	5.394326395	0.005714
TS(-3)	-0.000419327	0.00040105	-1.045574394	0.354778
C	-0.738892934	4.82306336	-0.153199923	0.885658
R-squared	0.998553897	Mean dependent var		4.982963
Adju R-squared	0.990600333	S.D. dependent var		2.049007
S.E. of regression	0.198655068	Akaike info criterion		-0.60033
Sum squared resid	0.157855345	Schwarz criterion		0.503529
Log likelihood	31.10448608	Hannan-Quinn criteri.		-0.2721
F-statistic	125.5479796	Durbin-Watson stat		2.093237
Prob(F-statistic)	0.000136696			

Source: Authors Computation from EViews 9 application (*) Indicate sig at 5%

Using AIC, the ARDL report shows unemployment having effects on its first lag and that of credit to the private sector. This confirms that credit policy does not have an impact on unemployment of the current period but takes a time lag of at least one year before its relevance on unemployment. However, the best lag selection with the ARDL was: ARDL (4, 3, 4, 4, 3) for unemployment, credit to the private sector (CPSR), inflation (INF), Commercial bank lending rate (LR), and Total private sector savings (TS). However, the bound test reveals that there exists a long-run relationship hence the need to run the ARDL with a long-run estimate.

Table 7:   Cointegration and Long Run Estimate

ARDL Cointegrating And Long Run Form				
Dependent Variable: UMR				
Selected Model: ARDL (4, 3, 4, 4, 3)				
Included observations: 27				
Cointegrating Form				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
D(UMR(-1))	1.352910712	0.3177715	4.257495436	0.013079675
D(UMR(-2))	-0.418864128	0.243437952	-1.720619666	0.160433649
D(UMR(-3))	1.135637895	0.287569717	3.949087225	0.01683089
D(CPSR)	-0.147455111	0.072366485	-2.037616057	0.111244722
D(CPSR(-1))	0.014822632	0.052306138	0.283382258	0.790945733
D(CPSR(-2))	0.081318622	0.077303316	1.051942221	0.352175805
D(INF)	0.031388085	0.013697099	2.29158642	0.083710681
D(INF)	-0.001284813	0.01109513	-0.115799705	0.913391999
D(INF)	0.041590692	0.014139459	2.941462768	0.042327425
D(INF)	-0.035473768	0.014711692	-2.411263639	0.073454211
D(LR)	-0.050628208	0.02742071	-1.846349312	0.138574539
D(LR(-1))	-0.044207618	0.047858235	-0.923720197	0.40791047
D(LR(-2))	0.008356137	0.053076746	0.157434998	0.882529521
D(LR(-3))	-0.135603541	0.044624228	-3.038787392	0.038447876
D(TS)	0.001073494	0.000236541	4.538310228	0.010510615**
D(TS(-1))	-0.001664662	0.000308595	-5.394326395	0.005713761
D(TS(-2))	0.000419327	0.00040105	1.045574394	0.354777762
CointEq(-1)	-0.874966478	0.136628592	-6.403977843	0.003053915
Cointeq = UMR - (-0.0173*CPSR + 0.0285*INF + 0.1835*LR + 0.0001*TS - 0.8445)				
Long Run Coefficients				
Variable	*Coefficient*	*Std. Error*	*t-Statistic*	*Prob.*
CPSR	-0.017276343	0.146285955	-0.118099809	0.91168158
INF	0.028524465	0.011134579	2.561791049	0.062519407
LR	0.183499802	0.184849226	0.992699869	0.377046546
TS	0.00009097	0.000195036	0.466441129	0.66517005
C	-0.84448142	5.483230114	-0.154011669	0.885058513

Source: Authors Computation from EViews 9

The result above, the t-statistics, and the p-values suggest that in the short run, UMR, as differenced, is significant at first and third lags with a positive relationship. This implies that even the unemployment growth rate in the previous period does not automatically respond to policy changes in the current period as the previous years' levels even to the

third year has a significant effect on the current period. The total private sector savings (TS) has a significant effect even at the difference and first lag. Credit to the private sector has a negative relationship though not significant in the short period. Also, inflation and the lending rate did not show signs of significance in the short run.

The long-run estimate is quite revealing. It shows that in the long run, CSPR has a negative relationship with the unemployment growth rate while other variables have direct positive effects. The p-values suggest that none of the monetary policy explanatory variables in the model is statistically significant in explaining the growth in unemployment. This succinctly underlines the ineffectiveness of monetary policy in regulating the magnitude and direction of the unemployment growth rate even in the long run.

4.5   Model Diagnostic test
Table 8: Ramsey RESET

Ramsey RESET Test			
	Value	*Df*	*Probability*
t-statistic	*1.200895515*	*3*	*0.315961722*
F-statistic	*1.442150039*	*(1, 3)*	*0.315961722*
F-test summary:			
	Sum of Sq.	Df	Mean Squares
Test SSR	0.051247952	1	0.051247952
Restricted SSR	0.157855345	4	0.039463836
Unrestricted SSR	0.106607393	3	0.035535798

Source: Authors Computation from EViews 9 application

To carry out a proper post-estimation diagnostic of the model, the Ramsey RESET test was employed. The decision rule: If the probability is significant, that is if the p-value is less than 0.05, it means the model has specification errors. The test is on H_0: The model does not have a specification error. The outcome of the Ramsey RESET test shows all probability values for t and f statistics are greater than .05. This shows the model does not have specification errors.

4.6   Policy Implication:
With the above result, credit availability to the private sector has a reverse effect on the unemployment rate while others have a direct positive effect on unemployment though the result shows that none of the variables is statistically significant in determining the rate of unemployment. Monetary policy alone does not have a significant effect on changes in the unemployment rate. When unemployment is targeted during policy prescriptions, fiscal policy initiatives should be emphasized. Availability of credit does not translate to job creation unless the application of funds is properly monitored. The failure of monetary policy could also be attributed to a high level of corruption, the impact of inflation, and the lending rate which act as a tax on available credit to the private sector.

5.0   Summary, Conclusion and Recommendations
Various studies have been carried out advancing reasons for the unabated increase in the unemployment rate. Most of the studies have linked unemployment to infrastructural decay, conflict in society, low-capacity utilization, government policy summersault, etc.

This study carried out an investigation of the relationship between monetary variables and unemployment in Nigeria.

This study, therefore, based on the result of the analysis; concludes that unemployment in Nigeria is attributed to very many factors. The volume and slow growth in credit to the private sector has over time resulted in a high level of unemployment. Over the years, the growth in unemployment has a higher percentage growth than that of credit to the private sector and growth in total private savings. Unemployment can be reduced with a higher proportionate growth in credit to the private sector and an increase in total private savings. This increased savings and credit to the private sector will eventually be applied to expand the economy through the revitalization of the small and medium-scale enterprises and eventual absorption of the teaming unemployed labour force.

The study further reveals a very weak contribution of inflation to growth in unemployment. This shows that the contribution of growth in inflation to the growth in unemployment is minimal and insignificant. The study further reveals that monetary policy variables do not necessarily have any immediate effect on unemployment but adjustment could be noticed in the long run. This succinctly shows that fiscal policy is more effective in reducing unemployment in the economy.

This study recommends that government should look more closely to the problem of unemployment and take urgent action to curb its effects on the economy.

1. Deliberate attempts to reduce unemployment through policies that target private sector participants should be driven by fiscal measures which will include the provision of social infrastructures and create a conducive environment for industries to grow. This will eventually create job opportunities.

2. Policy prescriptions targeted at reducing unemployment should target a more than proportionate increase in credit to small borrowers rather than large corporate borrowers. This will ensure that a greater percentage of total credit goes to the granular productive sector of the economy.

3. With the level of poverty and inflation in Nigeria, more attention should be focused on funding the productive private sector which will eventually enhance production and output and increase the employment lever.

4. Growth in private sector savings will result in growth in unemployment rate in the succeeding year since such savings crowd-out investment. Based on this, private sector players should be encouraged to invest their accumulated funds. Government should come up with policies to discourage large private sector savings by providing support services that will enhance investment in micro, small and medium-scale enterprises.

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THE IMPACT OF EXTERNAL PUBLIC DEBT ON ECONOMIC GROWTH IN NIGERIA: AN ARDL BOUND TESTING APPROACH

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Abstract

In this millennium, the external public debt levels of most developing countries especially Nigeria have started rising; giving vent to great concern in view of our experience of heavy debt burden and low economic growth in the past decades. This study empirically assessed the impact of external public debt on the economic growth of Nigeria. It statistically used investment, external debt service cost, inflation and terms of trade as indices for independent variable and gross domestic product as the dependent variable. Secondary data were collected for the period 1980 to 2021. The study employed the Augmented Dickey fuller (ADF), Philips-Perron (PP) and Dickey-Fuller (DF-GLS) to test for the intercept and intercept and trend of the stationarity of the data, Auto-regressive Distributed Lag Models (ARDL) estimates was used to obtain the cause effect relationship among the variables for the short and long run relationships. The result shows the long run adjustment estimates in explaining economic growth. The error cointegration term is negative and significant which means that any exogenous shock in one of the variables will lead to convergence towards the equilibrium. The result also, demonstrated that the short run estimates in explaining the economic growth are significant at 5% level of significance. The study recommends amongst other things that alternative source of funding in order to finance its increasing expenditure needs to stimulate the economic growth in Nigerian.

Keywords: Public debt, Economic Growth, Investment, Inflation, ARDL, Nigeria.

JEL Codes: C22, E31, F43

INTRODUCTION

Record showed that since the 1980s, some African nations have accrued significant sums of debt as a result of both internal and external shocks. Unsustainable debt accumulation led to repayment issues, a debt crisis in the 1990s, and a drag on economic growth and other development objectives. A number of African nations have benefited from debt relief since 1996 as a result of the Highly Indebted Poor Countries (HIPC) initiative, which was started by the World Bank and the International Monetary Fund (IMF), as long as they followed prudent economic management and anti-poverty policies. So, from 110% in 2001 to 35% in 2012, the average general government debt as a percentage of GDP, decreased significantly (Coulibaly, Gandhi and Senbet 2019).

It is anticipated that growth and development will most likely be positively impacted by an acceptable level of foreign debt. For instance, Nigeria initially borrowed money from outside sources in 1958 to pay for the country's railway extension to Bornu, Obadan

(2002). The external debt of Nigeria was extremely low in the 1980. However, by 1990, it had risen dramatically, from U$8.93 billion to U$33.45 billion, and by 2021, it had reached U$76.2 billion, with the current external debt standing at 3.40 trillion, World Bank (2022). Nigeria incurred significant debt from official creditors in order to advance economic development. The Debt Management Office (DMO) Nigeria announced on March 31st, 2023 that Nigeria's total public debt stock reached #46.25 trillion at the end of December, 2022 reflecting a 14.46% increase from the previous year's figure of #39.56 trillion DMO, (2023).

Nigeria is rich in natural resources, but they also lack adequate human capital, technological advancements, and savings and investment levels, all of which lead to low capital formation, low productivity, and low output. Given this unpleasant economic reality, borrowing money from abroad appears to be the preferred method of funding the ongoing budget deficit. Unfortunately, Nigeria has relatively limited resources and economic growth potentials, so the foreign public debt may not increase economic growth without the country having such potential. According to DMO, (2022) Nigeria total external debt could rise on 37.1% of its gross domestic product (GDP) in 2023, close to the government's self-imposed 40% limit, below is historical data of external debt between 2012 and 2021.

Table 1: Historical Data of Eternal Debt (2012 – 2021).

Historical data of external debt (2012 -2021)		
year	Current US$	Annual % Change
2021	$76,214,593,269	8.07%
2020	$70,524,292,158	17.46%
2019	$60,041,046,402	10.77%
2018	$54,202,577,785	18.40%
2017	$45,780,013,170	28.17%
2016	$35,717,779,489	10.19%
2015	$32,413,349,872	13.22%
2014	$28,628,765,478	16.94%
2013	$24,482,374,424	14.05%
2012	$21,466,867,539	2.21%

Source: Author's Compilation

It is worth noting that the anticipated rapid growth and development that necessitated the blowing spree in over the years did not take place. From the above table, it reflect continue increase in external debt blowing without meaningful development. The country witnessed an in increase over the years of external public debt. Available data showed that external debt increased from $21,466,867,539 and $24,482,374,424 representing 2.21% and 14.05% in 2012 and 2013 correspondingly. Again, external debt

increased from \$35,717,779,489 in 2016 to \$45,780,013,170 in 2017 reflecting 10.19% and 28.17% respectively. The data also revealed that between 2019 and 2020, external debt also increased from \$60,041,046,402to \$70,524,292,158 shimmering 10.77% and 17.46% respectively, with Nigeria's total debt stock racing to over #80trillion. There is heightened concern in the country stakeholders are of the view that Nigeria's economy is in an emergency situation and in the verge of collapse if nothing is done DMO, (2022) and this raises the question: Is there a nexus between external public debt and economic growth in Nigeria? Despite this slow growth, Nigeria persist in implementing annual budget deficit and borrowing from external sources to finance it. The problem is further aggravated by large number bogus and white elephant projects, official corruption, over-ambitious development plans, weak institutions, inappropriate policies and policy somersaults.

This enormous increase in public debt is expected to result in a corresponding increase in economic growth in Nigeria, as one of the goals of increases in public debt is to stimulate economic growth. Unfortunately, increases in public debt have not been able to produce a significant growth in Nigeria. The purpose of the study is to ascertain how Nigeria's governmental debt affects economic growth. Specifically the study seeks to provide answer to the following question; what is the effect of external public debt on the economic growth in Nigeria? The objective of this study is to determine the impact of external public debt on economic growth in Nigeria from 1980 to 2022.

2.0   Literature Review

2.1   Conceptual Literature

Public debt is a debt that is held by the government and state, as opposed to private businesses and the private sector. World Bank (2010) defines external public debt as an obligation of a public debtor, which includes the national government, a political subdivision, and autonomous public bodies, to foreign creditors. It entails the transfer of resources across international borders for service. The timely payment of principal and interest to the creditor is known as debt servicing. In actuality, the problem facing the majority of developing nations, particularly the low-income nations of sub-Saharan Africa, is their inability to pay their debts, which leads to debt accumulation and the potential for an external debt crisis.

The opportunity cost of repaying external public debt may be low public investment in physical infrastructure and human capital, low savings, and poor capital formation, with potential negative economic development as a result. This scenario could occur if a larger share of the public debt is dead weight debt rather than productive debt. When a nation takes on external debt to pay for costly wars and current expenses, it is dead weight; but, if the debt is taken on to fund investments in public goods and services, it is productive debt. Due to this, we may claim that, at a particular level of the foreign public debt to GDP ratio, which is, external public debt may have a positive or negative impact on economic growth.

Economic growth illustrates how quickly a nation's economy expands over time. It is typically expressed as the annual percentage rate of growth of the major national accounting aggregates of the nation, such as the Gross National Product (GNP), after

applying the necessary statistical corrections to account for the potential for price inflation to have an unintended effect (Todaro, 2000).

2.2   Public Debts and Growth Nexus

It is clear from theoretical literature that developed and emerging nations have different relationships with public debt and economic growth. Although there are certain shared characteristics, such the fact that both economic groups have a debt ceiling, the amount of this ceiling varies depending on the economic group. According to Reinhart and Rogoff (2010), the debt ceiling for some advanced economies is 90 percent of GDP, whereas the ceiling for transitional economies is 60 percent. smaller than 40% of GDP is the value for underdeveloped nations, which is significantly smaller. Because of the changes in per capita income, institutional variables, and policy, the debt threshold value varies even across emerging nations. While majority of them are categorized as low-income countries, several developing nations fall into the intermediate income range. This latter category includes the majority of the sub-Saharan African nations. We should discuss the applicable research on the relationship between public debt and economic growth for both advanced and developing nations in light of these observed discrepancies. The goal is to establish a foundation for better literary comprehension, less public debt, and increased economic development in sub-Saharan Africa.

2.3   External Public Debt and Growth Nexus: Developing Countries

A lack of enough domestic capital prevents almost all developing nations from meeting their ambitious development goals. When compared to industrialized economies, low income per capita and insufficient savings are the main causes of the resource shortage. The corrupt ruling class, faced with insufficient resources in their countries, would fraudulently enrich themselves through contract sum hyperinflation and outright embezzlement, and the loot is transferred to foreign accounts in developed countries, worsening and escalating the already deplorable economic conditions of their economies. This is another significant cause of capital flight. The current account deficits are exacerbated by both a lack of resources and corruption, which makes it unholy necessary to supplement domestic resources with foreign capital inflows in the form of debt, aid, and foreign direct investments.

Suma (2007) claims that in the 1960s, the external debt of developing nations was mainly formal and was relatively small. This indicates that the vast bulk of loans were obtained from foreign countries and international financial organizations including the World Bank, International Monetary Fund (IMF), African Development Bank, and other regional development banks. In order to finance capital goods imports as well as development initiatives, these loans were secured at below-market interest rates (Suma, 2007). However, the early 1980s oil boom led to a paradigm shift in the composition of developing countries' external public debt portfolios, as commercial banks that received a prodigious inflow of funds from oil producing and exporting economies pushed a significant portion of OPEC funds into the form of loans to developing nations that did not export oil in order to support their deficit balance of payments and to expand their export industries.

The debt contracts for the debtor countries have advantages and disadvantages. However, amid a financial crisis, foreign borrowing seems to have more negative effects than positive ones in many developing nations, particularly in sub-Saharan Africa. The

potential benefit of external debt is that it brings in resources to help the debtor nation achieve its development goals. Despite these potential economic advantages of external debt, the majority of economists and policymakers have expressed skepticism over the positive effects of indebtedness, aid, and other foreign resource inflows into developing economies, particularly since the 1960s. Stakeholders and observers alike have considerable concerns that neither the anticipated benefit of foreign resources on the level of savings nor the anticipated growth is supported by empirical evidence (Suma, 2007)

Despite the fact that the literature on public debt has not sufficiently explained why developing nations have not been able to employ borrowed money to produce enough output, critics of foreign exchange have generally maintained that it has a negative impact on sub-Saharan African countries. The establishment of the heavily indebted poor countries initiatives by the World Bank and IMF in 1996 to address the debt problems of 33 countries, of which 29 are in sub-Saharan Africa, may have been caused by public debt-induced economic crisis, which may have resulted in poor growth performance from the early 1970s to about 2005. However, conspiracy theorists such as Perkins (2004) have vehemently argued that the debt crisis of the majority of developing nations that borrowed money from the World Bank and the International Monetary Fund (IMF) in the 1970s and 1980s was caused by manipulations of Western nations, particularly the United States of America, through the process of persuasions, encouragement, and foreign aids on the one hand and hyper-inflated contracts and the execution of faculty projects doomed to fail on the other, operatives working for western governments, whose main goal is to discourage developing nations from adopting the communist ideology of the erstwhile Union of Socialist Soviet Republic (USSR), which engaged in a protracted cold war with the United States of America.

The United States of America's desire to turn the entire planet into a global empire in which US interests and those of her allies must always prevail is the secondary interest, according to Perkin's work (2004). This could be accomplished by using international financial institutions like the World Bank and IMF to push this agenda and multinational corporations as the executors of the plans.

2.4   Effect of Debt Service on Economic Growth
The price of getting money is the cost of debt servicing. Debt servicing, also known as amortization over the course of the loan, is the payment of the principle plus accrued interest. The magnitude of the loan and interest rates affect how much debt service is required. Therefore, it is suggested that the burden of debt servicing increases along with rising debt levels or interest rates.

Is it more likely that as the load grows, the economy of the debtor nation will suffer? The primary justification is that because external debt is negotiated in foreign currencies, debt service payments must also be made in those same currencies. This indicates that foreign currency or export earnings are used to pay the loan. Decreases in export revenues or increases in interest rates may therefore result in unprecedented increases in debt service payments or default on debt service obligations, which may result in debt hangover. Suma (2007) claims that these have been the experiences of the most indebted emerging nations, including those in sub-Saharan Africa.

2.5   Empirical Literature

There is a huge empirical literature on the impact of public debt on economic growth. Several research have targeted samples from developing nations,

Evidence based on Experience in Other Developing Nations

Getinet and Ersumo (2020), using data from 1983 to 2018 in Ethiopia and the ARDL technique, show that there is a long-term relationship between the external debt stock and GDP. Even while there was a negative association and it was substantial in the short term, it was not significant over the long term. El Aboudi and Khanchaoui (2021), using the ARDL estimating method, demonstrated that external debt significantly hinders Morocco's ability to build its economy. The impact of external debt on economic growth in Congo was validated by Antoine et al. (2021) using time series data from 1986 to 2015. Elhendawy (2020), utilizing data from 1980 to 2019, offered proof of a long-term inverse relationship between the payment of external debt and the national currency (pound) of Egypt. The results of this analysis demonstrate how Egypt's external debt repayment is depleting its resources. The estimating method used in the study was vector error correction.

Ngangnchi and Joefendeh (2021) looked at how much public investment and foreign debt in Cameroon contribute to economic growth. For this investigation, an Ordinary Least Squares (OLS) approach using time series data from 1980 to 2018 estimation was used. The analysis shows that external debt has a major detrimental impact on Cameroon's economic growth. The findings also show that public investment has a long-term, beneficial, and large direct impact on economic growth. According to additional findings, external debt and public investment both considerably and favorably contribute to economic growth.

The Nigerian evidence

Adamu and Rasiah (2016) investigated how Nigeria's external debt affected economic expansion. The research spanned the years 1970 through 2013. ARDL was used as the estimation technique. Despite the 2006 external debt relief, the study's findings indicated that external debt is bad for growth. (Ndubuisi 2017) conducted research to examine the impact of Nigeria's external debt on economic growth from 1985 to 2015. OLS, Johansen cointegration, and the error-correction test were used to evaluate the data. The study discovered a detrimental relationship between debt service payments and growth. The study employed the exchange rate and foreign reserve as two control variables. These factors connected growth in a favorable and important way. OLS model, Johansson cointegration estimation technique, and data from 1990 to 2016 were used by Ezema et al. (2018). The study found that servicing external debt had a significant negative influence on economic growth.

For policy research on public finance and public debt management in Nigeria, Ohiomu (2020) created a model of the relationship between foreign debt and economic growth. The ARDL approach was employed as the estimating technique. The analysis supported the presence of a debt overhang due to the adverse impact of external debt on growth. Didia and Ayolunle (2020) offered evidence that, although not statistically significant, external debts have a favorable short- and long-term association with the Nigerian economy. Adekunle et al.'s (2021) non-linear methodology added additional dimension. The dependent variable in the study was the debt service as a percentage of GDP.

According to the study's findings, the external debt stock threshold is 6.81% of GNI. Negative effects will be felt at any level higher than 6.81%.

Ogbonna et al. (2021) used the ARDL model to explore the connection between paying off external debt and growth. The study was conducted from 1986 to 2018. The analysis came to the conclusion that there is a long-term, significant negative correlation between Nigeria's economic growth and the servicing of its external debt. The analysis suggests that Nigeria use its foreign debt to its best advantage. Using annual data from 1980 to 2018 and the Autoregressive Distributed Lag method, Abdulkarim and Saidatu (2021) looked into how government debt affected Nigeria's economic growth. The empirical findings demonstrated that while external debt had growth-enhancing short-term effects, it was a long-term growth inhibitor.

Impact of Nigeria's external debt on economic growth, Ideh and Uzonwanne (2021) By evaluating the causal relationship between the stock of external debt and economic growth in Nigeria and identifying the influence of external debt servicing on economic growth in Nigeria, this study critically assessed the impact of external debt on economic growth in Nigeria from 1985 to 2019. The link between external debt service and economic growth in Nigeria from 1981 to 2020 was examined by Akanbi, A., Uwaleke, and Ibrahim in (2022). For this study, a quantitative research strategy was used. The Auto-Regressive Distributed Lags (ARDL) model was used for estimate. The outcome demonstrates how external debt services' effects on growth lead to resource depletion. Growth and the stock of external debt are positively correlated, though not significantly. External reserves to external debt ratio and growth have a positive but insignificant association.

We observe from the empirical literature that a variety of estimation techniques are used, such as panel growth regression (nondynamic and dynamic), panel smooth transition regression, panel threshold-ARDL model, etc. The empirical literature currently in existence provides contradictory findings regarding the impact of debt on economic growth, which is explicable by the various methods used to estimate growth and the samples of countries taken into account. Economic development is constantly adverse to high debt crises in all circumstances taken into consideration. In light of this, this study revisits the topic of the debt's impact on economic growth by using a different estimate technique that allows for heterogeneity and a smooth transition of regression coefficients from one regime to another.

3.0   Research Methodology

3.1   Theoretical Framework

With the help of Rommer's (1986) endogenous growth model, a theoretical foundation for modeling the empirical relationship between public debt and economic growth has been established. The following "AK" production function serves as the model's starting point:

$$Y = AK \qquad \text{-- (1)}$$

Where Y is production output, K is amount of physical capital and A is a positive constant. The emergence of endogenous growth theory coincided with the rejection of conventional neoclassical ideas as adequate explanations for long-term economic growth. The endogenous growth model, which differs from the neoclassical model of growth, is based on the more realistic premise of constant returns to capital, which implies that physical capital includes other types of replicable capital like human capital. Hussein and Thirlwall,(2000). As previously mentioned, our approach includes public debt in the growth function. The coefficient on the debt variable can either be positive (i.e., Keynesian hypothesis), negative (i.e., Debt overhang hypothesis), or insignificant (i.e., Ricardian-equivalence hypothesis). We also include two more important growth factors, namely inflation and terms of trade, to further ensure that our regression does not succumb to the bias caused by the missing variables. On the one hand, because the CBN has an inflation targeting mandate, inflation in the Nigerian setting provides a clear gauge of monetary policy impacts on economic growth. From a theoretical standpoint, although some early theorists argued on a positive relationship (Tobin, 1965) or an inconsequential association (Sidrauski, 1967), it has been considered that the impacts of inflation on growth are primarily negative. Contrarily, the terms of trade variable offers the most practical way to gauge openness. The importance of commercial activity to economic growth has increased during the 1990s, when markets were liberalized throughout the world. The classic growth theory predicts that greater trade openness would lead to stronger economic growth. However, more open economies may be more susceptible to absorbing the negative consequences of the crisis, hence openness may negatively impact growth during these times.

3.2   Model Specification

The empirical model for the study is specified as follows:

$$gdp = f (inv ,\ tds, inf.\ tot)\ \text{---}(2)$$

where Total debt service (TDS) is a measure of government debt as a percentage of GDP, INV is investment, INF is inflation and TOT is terms of trade, β_0-β_4= Coefficients of the variables and μ = error term

The linear equation will become;

$$gdp =\ \beta_o + \beta_1 inv + \beta_2 tds + \beta_3 inf + \beta_4 tot\ \text{--}(3)$$

The econometric equation will then be thus

$$gdp_{t-1} = \beta_{ot-1} + \beta_{1t-1} inv + \beta_{2t-1} tds\ + \beta_{3t-1} inf + \beta_{4t-1} tot + \mu\ \text{------------------}(4)$$

where the lower case letters represent the natural logarithms of the variables, β's are regression coefficients and et is a well behaved error term. We choose the ARDL model of Pesaran, Shin, and Smith (2001) as our preferred econometric modeling, as was previously noted. As in Amoateng and Amoako-Adu (1996), we estimate ARDL regressions—the bivariate regression between public debt and economic growth. B1s are the long-run regression coefficients, and it is crucial to check for cointegration effects

before estimating our ARDL models. To test the joint null hypothesis as follows, the study employs the limits test for cointegration effects.

$$H_0: \beta_1 = \beta_2 = ... = \beta_i = 0 \quad .... \quad (5)$$

And this is tested against the alternative hypothesis of significant ARDL cointegration effects i.e.

$$H_0: \beta_1 \neq \beta_2 \neq ... \neq \beta_i \neq 0 \quad .... \quad (6)$$

An F-statistical test is used to evaluate the test, and the results are compared to the upper and lower bound critical values listed in Pesaran et al. (2001). According to the decisions rule, cointegration is presumed if the obtained F-statistics exceed the upper bound of the critical statistics, there is no cointegration if the F-statistics are below the lower bound of the critical value, and there is no decision if the F-statistics are indecisive.

3.3   Data estimation procedure

In order to determine the importance of the independent variable to the dependent variable, multiple linear regressions will be used. Additionally, we have to assess the model's validity using the following key factors: The a-priori expectation criteria was established based on the magnitude and signs of the variable coefficients and economic theories. The a priori hypothesis for this study is as follows:

-1<fdt<0,exr<1<0,-1<dsp<0,-1<0inf<0

4.0   Presentation and Analysis of Results

Descriptive Statistics Result
This section presents the descriptive characteristics of the time series data used and the result is presented in table 1 below.

Table 2. Descriptive Statistics Result
Descriptive statistics

	GDP	INF	INV	TDS	TOT
Mean	3.069167	18.73532	0.336443	2.630375	-100.0158
Median	3.921555	12.70720	0.216527	1.949706	-45.96736
Maximum	15.32916	72.83550	1.919487	6.521339	21.76942
Minimum	-13.12788	5.388008	-0.018912	0.100218	-594.9905
Std. Dev.	5.322386	16.51315	0.439114	2.063052	128.7964
Skewness	-0.843228	1.892202	2.264701	0.513370	-2.097077
Kurtosis	4.740206	5.460031	8.011945	1.885373	7.612823
Jarque-Bera	10.27679	35.65356	79.86140	4.019032	68.02085
Probability	0.005867	0.000000	0.000000	0.134054	0.000000
Sum	128.9050	786.8833	14.13059	110.4757	-4200.662
Sum Sq. Dev.	1161.440	11180.05	7.905680	174.5036	680128.5
Observations	42	42	42	42	42

Source: Researcher's computation, 2023.

The data use in this study has been collected from the Central Bank of Nigeria and World Bank database from 1980 to 2021. The datasets consist of gross domestic products percentage annual (GDP), inflation (INF), investment (inv), total debt service (TDS) and terms of trade (TOT). The summary statistics for the employs time series are presented in table 1. The summary statistics reveal that debt service have averaged 2.63 of GDP, having reach maximum of 6.52. We note from the relatively high standard deviations, the government debt has been quiet volatile over the sample period. Economic growth, as measured by GDP has averaged 3.41 reaching a maximum of 15.32 in 2002 whilst reaching low of 0.80 in 2017. We observe that the reported GDP average are much lower than the targeted commonly stipulated or prescribed in policy programmes. Encouraging enough inflation has average 27.40 a statistics which falls right within the upper bound of the CBN target region. Lastly, domestic investment has average of 1.19 in 1993 as a share of GDP, a statistics which highlights the problem of low investment levels currently experienced in the country whilst the low growth average of 0.008 for terms of trade is a policy concern.

Table 3. Residual correlation matrix of the time series

	GDP	TDS	INF	INV	TOT
GDP	1	-0.41	-0.18	-0.45	0.10
TDS	-0.41	1	0.11	0.65	-0.16
INF	-0.18	0.11	1	-0.02	-0.11
INV	-0.45	0.65	-0.02	1	-0.31
TOT	0.10	-0.16	-0.11	-0.31	1

Source: Researcher's computation, 2023.

With the exception of the correlation between inflation and investment, which has a positive correlation coefficient, other correlation coefficients give estimates that are negative. Most of these correlations are tenable, which means that when viewed theoretically, we can see that the negative correlation between trade and growth runs counter to conventional theory, which postulates that openness is good for growth. However, Ajayi and Edewusi (2020) have already shown that there is a "strange" negative link between commerce and growth in Nigeria. Furthermore, the moderate estimate produced by the correlation coefficient between the several variables eliminates any potential indication of multicollinearity.

Table 4. Unit root tests results

Intercept				Trend and intercept		
	ADF	DF-GLS	PP	ADF	DF-GLS	PP
GDP	-11.86	-1.26	-12.72	-11.95	-2.33	-21.06
$(gdp)_9$	-11.86	-5.18	-11.86	-1.16	-3.64	-11.95
INF	-5.98	-5.55	-12.39	-5.90	-5.93	-12.03
$(inf)_9$	-5.98	-5.56	-5.98	-5.90	-5.94	-5.90
INV	-7.07	-7.17	-12.11	-7.01	-7.18	-12.13
$(inv)_9$	1.96	1.99	-10.28	1.97	1.99	-10.16
TDS	-6.33	-6.15	-8.69	-6.28	-6.25	-9.25
$(tds)_9$	-6.33	-6.14	-6.33	-0.45	-6.26	-6.28
TOT	-5.45	-1.60	-5.45	-5.54	-5.56	-6.71
$(tot)_9$	-5.44	-4.01	-5.44	3.35	-5.55	-6.43
Critical levels						
1% level	-3.61	-2.62	-3.60	-4.20	-3.77	-4.20
5% level	-2.93	-1.94	-2.93	-3.52	-3.19	-3.52
10% level	-2.60	-1.61	-2.60	-3.19	-2.89	-3.19

Source: Researcher's computation, 2023.

The ADF, PP, and DF-GLS unit root tests are used in the study to examine the stationarity of the underlying variables. These tests are run with (i) an intercept (ii) an intercept and a trend, and the results of this empirical exercise are shown in table 3 above. As can be seen, the results of the unit root test revealed a variety of empirical evidences. For instance, at their level for all unit root tests, whether run with an intercept or with a trend, total debt service and terms of trade all fail to support the null hypothesis for the unit root. But when all unit root tests are run with an intercept and only the PP test is run with a trend, inflation fails to reject the unit root hypothesis. In the case of GDP, the DF-GLS test conducted with an intercept or a trend is able to reject the unit root null hypothesis in its level while the other test statistics are unable to do so. Last, the unit root null hypothesis can only be rejected for investment in its levels when the DF-GLs test is run with an intercept. Despite this, all of the time series are able to reject the unit root hypothesis for the bulk of the observed time series in their initial differences. There are, of course, some exceptions where the variables and the first differences do not disprove the unit root null hypothesis. Examples include the investment variable when tests are conducted with a trend and the total debt service along with the variables when the ADF and PP tests are conducted with an intercept and the ADF is conducted with a trend. As a result, the researcher is free to move forward with the ARDL empirical modeling because it can be deduced that none of the other time series are successfully integrated of an order higher than 1(1).

Table 5. ARDL Bound test for co-integration

specification	Selected model	F-statistic	Critical value bounds					
			1%		5%		10%	
			1(0)	1(1)	1(0)	1(1)	1(0)	1(1)
f(gdp tds)	ARDL(1,0)	1.95	6.84	7.84	4.94	5.73	4.04	4.78
f(gdp tds inf,inv,tds	ARDL(1,0,0,0)	2.17	4.29	5.61	3.23	4.35	2.72	3.77
f(gdp tds -9	ARDL(1,0)	2.34	6.84	7.84	4.94	5.73	4.04	4.78
f(gdp tds inf,inv,tds-9	ARDL(1,0,0,0,0)	2.17	4.29	5.61	3.23	4.35	2.72	3.77

Source: Researcher's computation, 2023.

We move on to model the ARDL progressions after confirming that our employed series are not integrated of an order equal to or larger than other 1(2). We do a bonds test for cointegration on the four empirical specifications as the first step in this procedure. The Schwarz information criterion (SIC) determines the appropriate leg length for each regression. All regression specifications significantly reject the null hypothesis that there are no ARDL cointegration linkages among the variables, as can be inferred from the result shown in table 4, which supports this conclusion. The researcher discovers that each computed F-statistics is greater than the upper bound of the 1% critical level, showing cointegration effects at all levels of significance. These encouraging findings allow us to estimate the long-term ARDL relationships for each of the given regressions.

Table 6. long run ARDL co-integration estimates

	F(GDP tds_n)		F(GDP tds_n, inf,inv,tot)		F(GDP tds_9)		F(GDP tds_9, inf,inv,tot)	
	coefficient	p-value	coefficient	p-value	coefficient	p-value	coefficient	p-vaue
tds_n		-	-		-0.16	0.2**	0.00	
tds_9	0.27	0.48*	-	0.0***				0.53**
inf		-	0.17	0.0***			-7.62	0.47**
inv	-6.22	-	-6.22	0.0***			0.85	0.53**
tot	0.00	-	0.00	0.0***			0.85	0.63**

*, ** and *** denote the 10%, 5%, and 1% significance levels respectively. The newly west covariance matrix has been used to correct observed in the original estimates. Source: Researcher's computation, 2023

The coefficient on total debt service for all four regressions is negative and significant at all relevant levels, as can be seen from the long-run estimates presented in the table above. This empirical data supports the debt-overhang hypothesis for the Nigerian economy and adds to a large body of earlier research that discovered a similar negative debt-growth link for Nigerian data Emmanuel (2012); Favour, E.O; Idenyi, O.S; Oge, E.O and Charity I.A (2017); (Alagba and Eferakeya (2019); and (Ajayi and Edewusi (2020). We noticed that the remainder of the long run coefficients are similarly negatively related with economic growth at all significant levels. Whilst the finding of a negative inflation-growth relationship is theoretically expected and is previously documented in the study Onwubuariri,S E, Oladeji, I and Folake O (2021), the findings of a negative investment-growth and trade-growth relationship is contradictory to growth theory. However, we do not dismiss the empirical findings since former studies of Idris, M and Bakar, R (2017) and Ayinde, O. E., Olatunji, G. B., Omotesho, O. A.,and Ayinde, K. (2010) found a similar negative investment- growth and trade -growth relationship, respectively, for similar Nigeria data.

Table 7. Long –term estimates ARDL

D.gdp	Coef.	Std. Err.	t-sta.	P>|t|	[95% Conf.	Interval]
ADJ						
gdp						
L1.	-.5543572	.1598584	-3.47	0.002	-.8813042	-.2274101
LR						
tds	.0783853	.6881836	0.11	0.910	-1.329108	1.485879
inf	-.1010545	.1219435	-0.83	0.414	-.3504569	.1483479
tot	.010098	.0082203	1.23	0.229	-.0067145	.0269105

inv	-3.876488	5.062835	-0.77	0.450	-14.23115	6.478173
SR						
inf						
D1.	-.0352834	.0596185	-0.59	0.559	-.157217	.0866502
LD.	.1402443	.0570225	2.46	0.020	.0236202	.2568685
inv						
D1.	-2.883143	1.763961	-1.63	0.113	-6.49085	.7245631
_cons	4.748695	1.762839	2.69	0.012	1.143285	8.354105

Source: Researcher's computation, 2023

Table 6 shows the long run adjustment estimates in explaining economic growth. The error cointegration term is negative and significant which means that any exogenous shock in one of the variables will lead to convergence towards the equilibrium. An exogenous shock in economic growth or perhaps performance will lead movement towards the original equilibrium every year, thus equilibrium is stable. The result also, demonstrated that the short run estimates in explaining the economic growth are significant at 5% level of significance.

The diagnostic test of the ARDL result of the tests of error autocorrelation, heteroskedasticity and error normality. The Breusch and Godfrey test allows testing an autocorrelation of order greater than 1 and remains valid in the presence of the lagged endogenous variable among the explanatory variables. Heteroskedasticity qualifies data that do not have a constant variance. Error heteroskedasticity does not prejudice the estimation of the coefficients, but rather the statistical tests since the estimated standard errors of the coefficients are not adequate. All three tests show statistically significant results at the 1% threshold, so these values lead us to reject the null hypothesis of the absence of autocorrelation, heteroskedasticity and error normality.

5.0   Summary, Conclusion and Recommendation

5.1   Summary of the Findings
The study examined the impact of public debt on economic growth in Nigeria using the ARDL technique of analysis. The study focused on Nigeria experience spanning from 1990 – 2022. The findings revealed that there is a negative correlation between public debt and economic growth, albeit a bigger negative correlation four periods after the financial crisis. Debt payment costs are high and have a detrimental impact on economic growth.

5.2   Conclusion
After the global financial crisis and the subsequent global recession, there has been significant discussion throughout the years over whether or not more public debt would be the answer to better economic growth. Using Pesaran's (2001) ARDL cointegration approach, which enables modeling of cointegration relations among a mixture of 1 (0) and 1 (1) time series, we explore the case of the Nigerian economy in this work. Our

empirical findings demonstrate that while foreign public debt may contribute to short-term economic growth, its long-term impact is nonetheless detrimental. These latter data confirm the earlier findings that there is a negative correlation between public debt and economic growth, albeit a bigger negative correlation four periods after the financial crisis. Debt payment costs are high and have a detrimental impact on economic growth. According to the study's findings, the federal government should lower the rate at which it turns to loans, particularly foreign loans, to pay for budget shortfalls.

5.3   Policy Recommendations
The most important policy result of a study is that the government needs to find new sources of money to pay for its growing expenditure needs. Ultimately, it may also need to rely more heavily on taxing to maintain a more balanced budget. Thus, tax increases will eventually cause inflation to decline, which will lessen the pressure on the central bank to keep interest rates high.

A further finding from the study is that decision-makers should take into account the Federal Government's recent increases in the price of gasoline. These increases put more pressure on the government to finance future debt interest obligations, and as a result, fiscal policy should incorporate effective debt management practices with a focus on financial risk.

Therefore, to assure future stability of not only government debt but also future economic growth, policymakers should also emphasize coordination of fiscal and monetary policies.

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IMPACT OF RISING INTEREST RATE ON THE MANUFACTURING SECTOR IN NIGERIA

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Abstract
The study examined the impact of rising interest rates on manufacturing output performance in Nigeria from 1981-2021. The study employed the Autoregressive Distributed Lag Model (ARDL) and General Autoregressive Conditional Heterosedasticity (GARCH) models in analyzing the data. The ARDL estimated result found evidence that interest rate proxied by MPR positively impact on manufacturing output in the short run. The study also revealed that exchange rate has a significant negative impact on manufacturing output in Nigeria. The GARCH result found no evidence that interest rate fluctuations increase manufacturing sector output volatility. The study therefore, recommended that interest rate policies should be complemented by macroeconomic stability such as rapidly depreciating exchange rate which should be put in check.

Keywords: ARDL, GARCH, Financial Intermediation, Inflation, Interest Rate,

JEL Codes:

1.0   Introduction
Interest rates are major economic factors that influence the economic growth in an economy. Corb (2012) argued that interest rates are economic tools used by Central Banks to control inflation and to boost economic development. About ten years after the most acute phase of the financial crisis, the world economy remains stuck in a constantly changing interest-rate environment. At the time of this study, many countries have raised interest rates in the last six months, as central banks in the United States, England, India, Brazil, Saudi Arabia Nigeria and other nations have pushed the costs of borrowing higher in a bid to contain the most rapid inflation in decades. So far in 2022, at least forty five countries have lifted interest rates with more moves to come (Russell and Smialek, 2022).

Against the backdrop of a slowly contracting economy and sharply rising inflation, the monetary policy committee of the Central Bank of Nigeria (CBN) raised the monetary policy rate (MPR) by 200 basis points to 14 percent in July 2016, this was retained till march 2019 when the CBN reduced it to 13.50 percent. This was further reduced to 12.50 percent in May 2020 and to 11.50 percent in September 2020. Recently, the monetary

policy committee (MPC) of the Central Bank of Nigeria (CBN) has raised the monetary policy rate twice in 2022, from 11.50 percent in May and to 14 percent in July (Central Bank of Nigeria, 2022). These rising interest rates have been attributed to the aftermath of the corona virus pandemic which triggered government stimulus spending packages meant to cushion against the economic fallouts of the pandemic. And it has also been worsen by the Russian invasion of Ukraine which has altered supply chains and energy prices hikes (Harari, 2022).

However, policy makers have argued that higher interest rates are powerful tools for fighting rising prices. They make the cost of borrowing more expensive, which weighs on consumer demand and business expansions, and in turn cooling economic growth and slowing employment. The result is a weaker wage growth for households and lesser pricing power for companies, eventually pulling down inflation (Russell and Smialek, 2022). Thus, rising interest rates has become a global concern in recent periods in both developed and developing countries. Such hikes in the rates may hinder investment and production activities in key sectors of a developing economy like ours such as the manufacturing sector which is the main thrust of this research.

Since a peak of 7.83% in 1982, the contribution of manufacturing sector as a share of total economic output in Nigeria generally declined. Many factors have contributed to the variation in sector share through time notably is interest rate and exchange rate regimes, many of which show both the vulnerability of manufacturing to global economic pressures, as well as the impacts that policy changes can have in reshaping the sector (Alli 2016). Prior to the oil boom of the 1970's, manufacturing contributed approximately 10% to Nigeria's economic output. Thereafter, increased revenues from oil caused the sector's relative gross domestic product (GDP) share to decline; growth persisted albeit at a slower rate. The recession caused by the fall in oil prices in the early 1980's triggered policy attention to turn back to the manufacturing sector, with steel production gaining prime focus. The lack of affordability of imported goods, combined with the absence of foreign capital and technology, encouraged domestic production of basic commodities such as soap and salt (Charles, 2012).

According to Ajayi (2011), price manipulation through export and import subsidies encouraged the importation of intermediary inputs and thus the expansion of assembly based industry. A brief spike in manufacturing output was observed in the early 1980's so that it contributed to 7.83% of total economic output. However, the price manipulation discouraged domestic manufacture of inputs, as well as the investment in the infrastructure and human capital required to do so in the future and this share soon began to decline. A review of manufacturing sector output performance show that total manufacturing output in the formal sector in Nigeria was N6,845,678.59 million in 2010. It increased over the following two years, by N1,326,277.80 million or 19.37% in 2011 to reach N8,171,906.39 million and by N1,652,610.80 million or 20.22% in 2012 to reach a total of N9,824,517.19 million. In all three years, the formal manufacturing sector was dominated by output from the food, beverages and tobacco activity, with N4.93trillion or 72 per cent of output contributed in 2010. (Ekundayo,2018). Recent performance review shows that the real contribution of the manufacturing sector to GDP was 9.06 percent in 2019, 8.99 in 2020 and 8.98 in 2021 (NBS 2021).

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However, the role of interest rates in the performance of the sector has attracted interest of scholars. Thus, such study is important at this time when the country is undergoing a tough time with Naira depreciating in value and price hikes daily. Studying the responsiveness of the manufacturing sector to interest rate changes is important due to the fact that, it will help policy makers to know whether there is a stable long-run relationship between the interest rate system and manufacturing sector performance.

The Central Bank of Nigeria recently has increased the interest rate, from 11.5% to 13% and then to14%, a 2.5 percentage point hike that took effect immediately (CBN 2022). Whenever, the CBN changes the monetary policy rate, otherwise known as discount or interest rate, deposit and other financial institutions follow suit. Banks will therefore be raising their lending rates which will increase the cost of borrowing and reduce the demand for money.

The logic behind this is to reduce the inflationary pressure narrow the negative real interest rate spread and restore investor's confidence. But Nigeria is not a well-functioning economy and monetary policy in Nigeria has not been working well like in other countries, it is therefore unlikely that the hike in interest rate will lead to the intended purpose. The country has a high level of insecurity and political uncertainty as well as weak financial regulation, which have caused investors to pull their money out of the economy. Adding these problems with a hike in interest rate will imply that instead of reducing inflation, it will further raise the cost of borrowing which in turn reduces investment and production in the manufacturing sector.

Nigeria is confronted with high levels of unemployment and poverty; higher interest rates will increase the input costs and weaken the demand for manufactured goods which will further worsen the high levels of unemployment and poverty. Hence, the research delve into the subject matter with a view to proffer solution to the following questions:
  i.   What is the impact of interest rate on the Nigerian manufacturing sector output?
  ii.   What are the other macroeconomic factors that impact on manufacturing sector output in Nigeria?
  iii. What is the impact of interest rate fluctuations on manufacturing output volatility in Nigeria?

The main aim of the study is to examine the impact of interest rate on manufacturing sector output in Nigeria. The specific objectives are:
  i.   To determine the impact of interest rate on manufacturing sector output in Nigeria.
  ii.   To examine the impact of other macroeconomic variables on manufacturing output in Nigeria.
  iii. To examine the impact of interest rate fluctuations on manufacturing output volatility in Nigeria

2.0   Literature Review

2.1   Conceptual Literature

The Concept of Interest rate

Acha and Acha (2011), defined interest rate as an important economic price; which can either be seen as a cost of capital or as an opportunity cost of funds. It is the opportunity cost of borrowing money from a lender. It can also be seen as the return being paid to the provider of financial resources. It is an important economic price. This is because whether seen from the point of view of cost of capital or from the perspective of opportunity cost of funds, interest rate has fundamental implications for the economy either impacting on the cost of capital or influencing the availability of credit, by increasing savings (Acha and Acha 2011).

The Manufacturing Sector

This is the sector of the economy that includes all the firms that transform raw materials into finished goods with the aid of machinery (Lambo 1987). Furthermore, when viewed from the Nigerian situation, the manufacturing sector includes all the small scale, medium scale and of course, large scale industries producing in the Nigerian economy. The manufacturing sector in Nigeria is the similar to that of any developing country that has pursued import substitution industrialisation behind high protective system.

2.2   Theoretical Literature

The Classical Theory of Interest Rates

The origin of monetary theory lies in classical economics, starting with the work of Adam Smith (1723-1790), (Ritter, Silber & Udel, 2009). The classical theory opined that the supplies of savings derived mainly from households and the demand for investable capital, coming mainly from the business sector are the major determinants of interest rate (Rose, 2013). Furthermore, this theory defines interest rate as the element that equates savings and investment. Thus, the classicists believe in the existence of a fully employed economy where saving and investment are always equal. Accordingly, interest rate is a function of savings and investment such that the higher the rate of interest the more saving will be made and the lower the rate of interest, entrepreneurs will opt to borrow in order to invest. Therefore, any shift in the supply or demand of loanable funds will cause market forces to drive the rate of interest back into equilibrium at different levels. In addition, it was found that it is the flexibility of interest rate that will ensure that the amount of savings is always equal to investment and total income will always be equal to total spending (Ritter, Silber and Udel, 2009).

The Loanable Funds Theory

The loanable funds theory is an improvement to the classical theory of interest rate, due to its inclusivity of both monetary and non-monetary aspects of the problem (Rose, 2013). Unlike the classical theory, the loanable funds theory asserts that the equilibrium interest rate equates the quantity supplied of loanable funds, which according to Khandker and Khandker (2008) consist of savings, with the quantity for loanable funds, which consist of investments and bonds financed by government deficit. According to this theory, the interest rate is determined by supply and demand in the market for credit (Saushini & Sheefeni 2016). This implies that interest is the price that equates the demand

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for loanable funds with the supply for loanable funds. The loanable funds theory is broader than the classical theory because it considers the rate of interest as the function of four variables: savings, investment, the desire to hoard money and supply of money.

2.3   Empirical Review

There are many empirical findings relating to interest rate and the manufacturing sector in Nigeria and other parts of the world. Such studies are;

Pam, Pam, Chinedu & Udoh (2021) examined the impact of interest rate on the manufacturing firms in Nigeria from 1981 to 2018. The study adopted the ordinary least square regression and the auto regressive distributed lag (ARDL). The study result revealed that interest rates has no significant impact on the manufacturing sector output and capacity utilization while interest rates has a significant impact on manufacturing value added in Nigeria. The study then recommended that interest rates be pegged to a single digit by the authorities so as to let manufacturing firms operate on full capacity that will enable them to absorb any hike in interest rates

Ozigbo (2020) investigated the impact of interest rate dynamics on the performance of manufacturing sector in Nigeria using data from 1980 to 2019.The study adopted the error correction model and the GARCH and ARCH model to analyse the study. The ECM result shows that the high interest rate in Nigeria has negatively affected the performance of the manufacturing sector. The GARCH and ARCH results indicates that interest rate fluctuation has influenced the performance of the manufacturing sector. The study therefore recommended that the Central Bank of Nigeria encourage the reduction of the interest rate in Nigeria which will increase the performance of the manufacturing sub-sector in Nigeria.

George-Anokwuru & Bosco (2020) examined the effect of interest rate on industrial sector which comprises of the manufacturing sector in Nigeria from 1980 to 2018. The study adopted the Autoregressive Distributed Lag model to analyse the objectives of the study and the result showed that there is the existence of a positive relationship between interest rate and industrial output both in the long run and short run. The study concluded that interest rate has the capacity to impact on industrial output in Nigeria and therefore, recommended that the Central Bank of Nigeria should promote the rate of interest that will encourage investors to borrow in order to boost manufacturing sector output.

Opusunju, Akyüz & Santeli (2019) examined the effect of interest rate on the growth of manufacturing sector in Nigeria using time series data from 1985-2015. The study adopted the error correction model (ECM) and the ordinary least square (OLS) technique of analysis to analysis data. The result of the study found that interest rate has a significant impact on growth of manufacturing sector in Nigeria. The study therefore recommended that banks in Nigeria should come up with a low level interest rate to enable the growth of manufacturing sector in Nigeria.

Nwokoro (2017) examined the impact of foreign exchange and interest rates variations on the Nigeria's manufacturing Output during the period 1983 to 2014. The study employed the Ordinary Least Square (OLS), stationarity, co-integration, together with Error Correction Modelling, to know the significance and relationship between Foreign Exchange Rate, Interest Rate, Capacity Utilization, Government Expenditure on

Manufacturing Sector, Investment in Industrial production and Manufacturing Output in Nigeria within the period under review. All the variables were stationary at first difference and there also exists equilibra relationships between the regressand and the explanatory variables. The result found that foreign exchange rate (FREX) and interest rates (INTR) have negative but significant relationship with manufacturing output (MANO). The study recommended that Nigeria's interest rate policies should be reviewed that will be targeted at reducing interest rate on loans to the manufacturing sector.

Nwandu (2016) examined the impact of rising interest rates on the performances of the manufacturing sector in Nigeria using time series data covering the period1981 to 2015. The study adopted the OLS technique of analysis to analyse the objectives of the study and the result found that rising interest rate in Nigeria has a negative impact on the contribution of the manufacturing sector to GDP. The study recommended that aside from efforts to manage interest rate to boost investments in the manufacturing sector, the government should try to provide adequate infrastructural that will reduce the high cost of production in manufacturing sector.

Okwori, Ochinyabo, & Sule (2014) studied the role of interest rate on manufacturing sector performance in Nigeria using data from 1986-2012. The study objectives were analyzed using Ordinary Least Square (OLS) multiple regression model and the result found that the major factors that influence the level of manufacturing sector performance are electricity supply, inflation and lending interest rate. Other factor includes, inadequate tax relief, enabling environment, political will, obsolete technology, preference for foreign goods, among others. The study then recommended that government should be consistent with the interest rate policies that will bring about sustainable growth in manufacturing sector.

2.4   Research Gap from review of previous Studies
The literature reviewed, reveals so many empirical studies have so far been done on the subject relating to impact of interest rate on manufacturing sector across the world. Most of the studies focused on impact of interest rate on the manufacturing sector using simple OLS technique and short period data which does not bring out a robust result for such analysis. This study will therefore examine the impact of interest rate on manufacturing sector in Nigeria using both ARDL and GARCH models and a data period covering 1981 to 2021. This will enable us to examine the dynamics and volatility effect of hikes in interest rate on the manufacturing sector in Nigeria which will cover all the policy changes and dynamics that have taken place in the country.

3.0   Research Methodology
Model Specification
The study made use of econometrics research design for addressing the objectives of the study. The researcher adopted the multiple regression analysis based on the classical linear regression model, otherwise known as Ordinary Least Square (OLS) technique to analyze the objectives.
Thus, the hypothesized relationship for the impact of exchange rate on private investment is functionally expressed as follows:
mangdp = f (mlr, ms/gdp, inf, exchr)…………………………………………....….3.1

Where:
MANGDP = manufacturing sector output. This represents output (gdp) produced from the manufacturing sector.
EXCH = real exchange rate (real exchange rate is measured by the annual Naira/Dollars) representing monetary policy.
INF = Inflation rate - %).
MPR = monetary policy rate – (%).
PSC/GDP = ratio of private sector credit to gdp representing the financial intermediation.

Analytical Model

From the hypothesized relationship, the model for objective one of the study was specified as;
$$MANGDP = \beta_0 + \beta_1 MPR + \beta_2 INF + \beta_3 PSC/GDP + \beta_4 EXCH + \mu \ldots\ldots\ldots\ldots\ldots 3.2$$
β_0 is the intercept of the models. It captures the level of output from the manufacturing sector that can be attained in the absence of interest rate fluctuations.

β_i (i = 1, 2, 3) are respective coefficients of the associated independent variables. Each determined the nature of the relationship between the associated independent variable and manufacturing sector output.

μ is a random variable introduced in the models to accommodate the effect of any other factor that has influence on manufacturing sector output but not captured in the models.

Model Preliminary tests
Unit root Test
The study also tested the stationarity of the variables using the Augmented Dickey Fuller (ADF) test. For all time series data ADF test is a utilized to test for unit root. The following equation checks the stationarity of time series data used in the study.

$$\Delta y_t = \beta_1 + \beta_2 t + \delta y_{t-1} + \alpha_i \sum_{t=1}^{m} \Delta y_{t-1} + \varepsilon_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots.3.3$$

Where: 't' is the white noise error term.
The stationarity test determines if the estimates of δ are equal to zero or not.

The Bound Test
In an ARDL model, the F test is used for testing the existence of a cointegration relationship. The null hypothesis of no cointegration among the variables in equations 3.4 is:
Ho: $\beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = 0$.
The F test has a non-standard distribution which depends on whether the variables included in the model are stationary at levels or first difference, and the number of regressors. If the F test statistics exceed their respected critical values we can conclude that there is evidence of cointegrating relationship between the variable respective of their order of integration and vice versa, and the short run result will be analyzed and if there is no co-integration the normalized earlier long run result will be analyzed.

The ARDL Model
This study adopted the ARDL mode because it incorporates variables that are of the mixed order of integration 1(0) and 1(1). Also the ARDL modelling incorporates

sufficient number of lags to capture the data generating process and is highly suitable when the sample size is relatively small. Thus, the ARDL model specification is

$$\Delta MANGDP_t = \beta_0 + \beta_1 \sum_{i=1}^{n} \Delta(MPR)_{t-1} + \beta_2 \sum_{i=1}^{n} \Delta(INF)_{t-1} + \beta_3 \sum_{i=1}^{n} \Delta(PSC/GDP)_{t-1} + \beta_4$$

$$\sum_{i=1}^{n} \Delta(EXCHR)_{t-1} + \psi_1 MANGDP_{t-1} + \psi_2(MPR)_{t-1} + \psi_3(INF)_{t-1} + \psi_4(PSC/GDP)_{t-1} + \beta_5$$

$$\sum_{i=1}^{n} \Delta(EXCH)_{t-1} + \delta_1 ECM_{t-1} \ldots\ldots\ldots\ldots\ldots 3.4$$

The GARCH Model
One of the principal directions in evaluating volatility or uncertainty is the generalized autoregressive conditional heteroscedasticity (GARCH) model of volatility. The study specified a GARCH (1, 1) model of manufacturing sector output volatility using a multivariate modelling approach of GARCH where other explanatory determinants of output volatility are included in the variance equation with lags. We therefore specify our fundamental GARCH volatility process as:

$$\sigma_t^2 = \alpha_0 + \alpha_1 \mu_{t-1}^2 + \alpha_2 \sigma_{t-1}^2 \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad 3.5$$

which says that the conditional variance of μ at time t depends not only on the squared error term in the previous time period [as in ARCH(1)] but also on its conditional variance in the previous time period (Gujarati, 2004).

where σ_t^2 equals the conditional variance (squared variance), given information available at time t. α_0 is the constant, and the α_1 refers to a first order ARCH term (i.e., news about volatility from the previous period) and α_2 a first order GARCH term (i.e., persistent coefficient). The conditions that $\alpha_1 \geq 0, \alpha_2 \geq 0, and\ \alpha_1 + \alpha_2 < 1$ ensure the positive and stable conditional variances of μ_t. The sum $\alpha_1 + \alpha_2$, measures the persistence of shocks to the conditional variances. To estimate output variability, we take the conditional standard deviation of manufacturing output growth rate (Y) in GARCH (1, 1) order as specified in equation (3.6). Thus, we specify our new conditional variance equation as:

$$\sigma_t^2 Y = \alpha_0 + \alpha_1 \mu_{t-1}^2 + \alpha_2 \sigma_{t-1}^2 + \sum_{i=0}^{q} \delta_i \check{Z}_{t-1} \quad . \quad . \quad . \quad . \quad (3.6)$$

where "$\check{Z}$" is a vector of explanatory variables that could determine or influence manufacturing sector output volatility. These explanatory variables included in the variance equation are: (1) interest rate, exchange rate, and ms/gdp. The values of these volatility variables can also be calculated from their standard deviations.

Technique of estimation
The techniques of estimation in this study start with the unit root test which is done to know the reliability of the data for the regression estimation. When the different orders of integration are known, the next procedure is conducting a bound test for co-integration. And should co-integration exist the ARDL short run model is estimated. Also, the study employed the generalized autoregressive conditional heteroscedasticity (GARCH) in evaluating volatility or uncertainty of the last objective.

Source of Data

In order to identify and determine the relationship between interest rate and manufacturing sector output in Nigeria, the study used secondary data collected from central bank of Nigeria (2021 bulletin).

4.0   Presentation and Analysis of Results
4.1   Descriptive Statistics
Table 1 Descriptive characteristics of the variables

	MANGDP	MPR	PSCGDP	EXCHR	INF
Mean	4219.768	13.00000	11.47317	108.1676	19.33439
Median	3578.640	13.00000	8.090000	111.9400	12.70000
Maximum	6684.220	26.00000	22.75000	399.9600	72.80000
Minimum	2898.470	6.000000	5.810000	0.610000	4.700000
Std. Dev	1309.560	3.959167	5.529528	109.9109	17.17720
Skewness	0.836511	0.734305	0.687670	0.972926	1.694875
Kurtosis	2.094196	4.542775	1.718478	3.172433	4.696874
Jarque-Bera	6.183280	7.750652	6.037013	6.519126	24.54839
Probability	0.045427	0.020748	0.048874	0.038405	0.000005

Source: Computed by the researcher

As can be seen in Table 1, all the variables in the series are non-normally distributed. The null hypothesis of normal distribution is rejected for MANGDP, MPR, PSCGDP, EXCHR and INF at the 5% level for the rest of the series. The mean and median of MPR and EXCHR are positive and high with EXCHR above 100%. This suggests that terms of monetary policy rate and real exchange rate especially at the beginning of each fiscal year were significantly positive and perhaps imply that higher average values attract larger manufacturing output growth. Three of the variables from the table also do not show evidence of fat tails, since the Kurtosis did not exceeds 3, which is the normal value, only MPR and inflation show evidence of fat tail. This implies a bit of left and right fat tails, however, the study can employ the GARCH model since there is no much kurtosis problem.

4.2   Unit root test

The analysis for this study with time series monthly data from 1981 to 2021 started with the ADF unit root test as presented in (Table 2). Interest rate (proxied by MPR) and inflation were found to be stationary at level; while others, manufacturing output, exchange rate and financial intermediation variable were found to be stationary at first difference at the 5% level (table 3) for the ADF test. See appendix for the results.

Table 2 ADF Unit root test results of the series in levels

variable	ADF value	Critical value (5%)	Outcome	Result
MANGDP	0.176521	-1.949609	Not stationary	-
MPR	-3.334522	-2.936942	Stationary	I(0)
PSC/GDP	0.358334	-1.949319	Not stationary	4
EXCHR	4.464697	-1.949319	Not stationary	4
INF	-3.217423	-2.936942	Stationary	I(0)

Source: authors computation
The ADF test for MANGDP, PSC/GDP and EXCHR were conducted without constant
and trend at 5% critical value, while MPR and INF were conducted with constant at
5% critical value.

Table 3 ADF Unit root test results of the series in levels

variable	ADF value	Critical value (5%)	Outcome	Result
MANGDP	-4.431276	-1.949609	stationary	I(1
PSC/GDP	-5.758184	-1.949856	Stationary	I(1)
EXCHR	-4.074471	-2.938987	Stationary	-

Source: author's computation
The ADF test for MANGDP, PSC/GDP and EXCHR were conducted without constant
and trend at 5% critical value, while MPR and INF were conducted with constant at
5% critical value.

The results of the ADF statioarity test of the variables has a mixture of level stationarity and first difference stationary variables which supported the estimation of ARDL model as shown in table 5

Table 4 Bound test for the estimation with manufacturing output as dependent variable

Test –Statistic		Critical Value Bounds			Remark
F-Statistics	K	Sig. level	Lower Bound	Upper Bound	
7.659251	4	1%	3.74	5.06	Cointerated
		5%	2.86	4.01	Cointerated
		10%	2.45	3.52	Cointegrated

Source: Authors computation

The calculated F-statistics are reported in Table 4 when each variable is considered as a dependent variable (normalized) in the ARDL-OLS regressions. From these results, it is clear that there is a long run relationship amongst the variables when manufacturing output is the dependent variable because its F-statistic (7.659251) is higher than the upper-bound critical value (4.01) at the 5% level. This implies that the null hypothesis of no cointegration among the variables is rejected.

4.3 The ARDL Model
Table 5: The ARDL equation (4, 4, 4, 0, 1)

	Dependent Variable: MANGDP			
Variables	Coefficient	Std. Error	T-statistics	Probability
D(MANGDP(-1))	0.099612	0.160883	0.619162	0.5432
D(MANGDP(-2))	-0.200794	0.124890	-1.607762	0.1244
D(MANGDP(-3))	0.175009	0.131178	1.334137	0.1979
D(MPR)	4.281330	4.137811	2.243053	0.0354
D(MPR(-1))	33.208870	21.327233	1.557111	0.1359
D(MPR(-2))	-57.464034	18.712244	-3.070932	0.0063

D(MPR(-3))	40.463003	16.057114	2.519942	0.0208
D(PSCGDP)	-40.799058	29.666413	-1.375261	0.1851
D(PSCGDP(-1))	40.569207	53.633905	0.756410	0.4587
D(PSCGDP(-2))	-16.331604	47.257709	-0.345586	0.7335
D(PSCGDP(-3))	-86.890517	32.189370	-2.699354	0.0142
D(EXCHR)	-1.817973	0.811478	-2.240323	0.0349
D(INF)	-0.974024	3.945244	-0.246886	0.8076
CointEq(-1)	-0.273879	0.084036	-3.259071	0.0041
Diagnostic Tests				
Ramsey reset test	0.8690			
Heteroskedasticity BPG	0.4015			
Normality test	0.730214			
Serial Correlation LM test	0.0531			

Source: Authors computation using E-views 10.0

The short run dynamic model was estimated following the presence of cointegraton in the bound test. The estimated ARDL error correction terms measured the transitory deviations from the steady state equilibrium value of each variable present in the long run relationship. The coefficient of the error correction term in this case measures the speed of adjustment from the short run to the long run equilibrium. Results from table 4.5 suggest that the current value of interest rate (MPR) and the third period lag have a significant positive impacts on manufacturing sector output (positive impact though not expected), the second period lag has a significant negative impact on manufacturing sector output, while the first period lag has no impact. This means that a unit increase in monetary policy rate leads to a 4.28 unit increase in manufacturing output.

Also, current value of financial intermediation variable (PSC/GDP), first and second period lags have not significant impact on manufacturing output though the third lag is significant. Exchange rate has a significant negative impact on manufacturing sector output, a unit increase in exchange rate leads to a 1.8 unit decrease in manufacturing output. All variables here are considered significant at 5 percent level. The coefficient of ECM_{t-1} (-0.2738) is significantly different from zero and bears the right sign thus validating the existence of cointegration in the system. With this, it indicates that when an external shock disturbs the equilibrium condition of manufacturing output, about 27 percent of it is absorbed within one year period.

The major objective is to estimate the impact of interest rate on manufacturing sector output in Nigeria, from the estimated result in table 4.5, interest rate is positively related to manufacturing sector output and statistically significant. However, the positive impact is not expected, but could be due to some other factors due to governance or the dominance of government bonds or bills which may signal why interest rate has a positive influence on manufacturing output.

The second objective of the study is to examine the impact of some macroeconomic variables on manufacturing output, and the estimated result shows that exchange rate and lag values of PSC/GDP (financial intermediation) have significant impacts on

manufacturing sector output in Nigeria. Current values of PSC/GDP and inflation have no significant impact on manufacturing sector output in Nigeria. The post-estimation diagnostics indicate good result the Breusch-Godfrey (BG) statistic show that the null hypothesis of no serial autocorrelation is accepted, given the non-statistically significant value of the BG test. Furthermore, the residuals are homoscedastic, as shown by the non-significant BPG test results, respectively. Finally, the model passes the test for specification bias as indicated by the RESET test statistic.

4.4 The GARCH Model
Table 6 The Garch model

Mean Equation			
	Coefficient	Std. Error	probability
Constant (μ)	3520.916	0.000216	1.0000
AR(1)	1.00000	0.054738	0.0000
Variance Equation			
Constant(ώ)	313363.5	268463.7	0.2431
ARCH (1) (α)	0.350890	0.419241	0.4026
GARCH (1) (β)	0.284661	0.450005	0.5270
MPR (δ)	-13266.51	14441.53	0.3583
EXCHR (η)	-407.5812	349.1676	0.2431
INF (ρ)	619.6651	3883.273	0.8732
R-squared	0.870416		
Adjusted R-squared	0.867094		
Inverted AR Roots	1.00		

Source: Author's Computation using E-Views

From the result in the table above, the ARCH and GARCH coefficients (0.350890 and 0.284661), both the ARCH and GARCH values are not statistically significant which indicates that shocks to volatility do have a persistent effect on the conditional variance. The coefficients of MPR, real exchange rate, inflation in the GARCH (1, 1) measure the predictive power of current values of the variables on manufacturing output in Nigeria. As can be seen from Table 4.6 the coefficients of MPR and exchange rate are all negative but not significant implying that an increase in the volatility or fluctuations in either of the variables do not increase the conditional manufacturing output volatility. However, the result could help us in interpreting that fluctuations in interest affect volatility in manufacturing output which was also supported by the evidence of ARCH effect.

Arch test
In estimating the ARCH effect of the GARCH estimation result above, we performed the ARCH-LM Heteroskedasticity test. Often a "Ljung box test" with 15 lagged autocorrelations is used.

Table 7

F-statstics	0.646231	Prob. F (1,38)	0.4265
Obs *R-squared	0.668868	Prob. Chi-Square(1)	0..4134

However, the GARCH model did assume a symmetric response of volatility to past shocks. The test p-values shown in the table above are not close to zero, accepting the null hypothesis which says that "there is no ARCH" at 5 % level.

4.5 Discussion of Findings

The study was designed to examine the impact of interest rate on manufacturing output and after the empirical analysis the study found interest rate (proxied by MPR) has significant positive impact on manufacturing output in Nigeria. This failed to agree with the findings of (Pam, Pam, Chinedu & Udoh, 2021) who found that interest rate has no significant impact on the manufacturing sector output.

However, the significant impact of the study agrees with the study of (Ozigbo 2020) who found that high interest rate in Nigeria has negatively affected the performance of the manufacturing sector. The nature of the impact differs, the study found a positive significant impact whereas (Ozigbo 2020) has a negative impact. The significant impact also agreed with (Opusunju, Akyüz & Santeli 2019) who found that interest rate has a significant impact on growth of manufacturing sector in Nigeria. The same is applicable with that of (Nwandu 2016), (Okwori, Ochinyabo, & Sule 2014), however, all the studies had interest rate having a negative impact on manufacturing output while the study found a positive impact. This may be attributed to the interest rate used; most studies used the prime lending rate to represent interest rate while this study used the monetary policy rate (MPR) to represent interest rate. This outcome suggests that MPR has so far positively favoured the performance of the manufacturing sector output in Nigeria.

Another aim of the study is to examine the impact of other macroeconomic variables affecting manufacturing sector output. The study found that exchange rate has a significant negative impact on manufacturing sector output. This is in agreement with the study of (Nwokoro 2017) who found that foreign exchange rate has a negative but significant relationship with manufacturing output.

Lastly, the study also investigated whether interest rate fluctuations impact on the volatility of manufacturing sector output, and the study found that fluctuations in interest rate do not influence manufacturing output volatility. However, this did not agree with (Ozigbo 2020) whose GARCH and ARCH results indicates that interest rate fluctuation has influenced the performance of the manufacturing sector.

5.0 Summary, Conclusions and Recommendations

5.1 Summary of the findings

The study tries to shed light on the impact of rising interest rates on manufacturing output performance in Nigeria from 1981-2021. *Ex-post facto* research design was used which involves the use of the Autoregressive Distributed Lag Model (ARDL) and General Autoregressive Conditional Heterosedasticity (GARCH) models. The data was analysed using the Augmented Dickey Fuller (ADF) unit root test. The unit root test (ADF) found that two of the variables were stationary at levels while the rest including the dependent variable (manufacturing output) were stationary at first difference. The ARDL estimated result made the following findings.

First, the study found evidence that interest rate positively impact on manufacturing output in the short run. Thus, since the study used MPR as interest rate, it could implied that MPR has favoured manufacturing sector output performance

Second, the study established that exchange rate has a significant negative impact on manufacturing output in the short run in Nigeria.

Third, the GARCH estimated result found no evidence that interest rate fluctuations increase manufacturing sector output volatility. In fact, it appears that neither monetary policy rate nor any of the macroeconomic variables contribute to manufacturing output volatility.

5.2   Conclusions

The main finding emerging from this study indicates that interest rate in Nigeria has been significantly contributing to the growth of manufacturing sector output in the short run. This implies that rising interest rate has not refrained investors in the manufacturing sector from seeking funds from banks, an outcome quit unusual. The study also noted that exchange rate as a macroeconomic variable has a significant negative influence on manufacturing output and interest volatility has not contributed to the erratic performance of the manufacturing sector output.

A notable conclusion from the findings of the study is though, interest rate (MPR) is significant for manufacturing output performance, there are other variables determining the performance of manufacturing sector output. In light of the findings of this study, it is important to recommend policy measures to further enhance the effect of interest rate on economic growth.

5.3   Recommendations

The findings of the study show that monetary policy rate has made crucial impact on manufacturing sector output. What is revealed here from the analysis of other studies is that it has failed to improve other interest rates such as the lending rate via private sector credit – since the PSC/GDP was found insignificant. The policy implication of this result is that the monetary policy in Nigeria has not been wisely implemented to get the fruits of the manufacturing sector. It shows that interest rate policy alone is not sufficient to boost the sector. Based on the above the following recommendations are made:

Therefore, policies that promote interest rate and financial intermediation should be promoted. Government can for instance improve intermediation by reducing taxation on the manufacturing sector and give incentives for its development.

Moreover, to the extent that exchange rate affects manufacturing sector, the structural changes, in exchange rate has to be considered simultaneously with that of interest rate changes, to make these variables to exhibit rising contributions in the manufacturing sector. Thus, interest rate policies should be complemented by macroeconomic stability that is, fiscal deficits, and rapidly depreciating exchange rate should be put in check.

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DIVERSIFICATION OF THE NIGERIAN ECONOMY: THE ROLE OF TOURISM IN THE GROWTH PROCESS

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Abstract
This study examined the effects of the tourism sector on economic growth in Nigeria. It argued that Nigeria's economy can be diversified through the tourism sector if given serious attention as it has a lot of potentials for high, rapid and sustainable economic growth. The study adopted a dynamic framework in establishing the long run relationships among the variables. Data for the study covered the period 1981 to 2020, the cointegration and VECM techniques were employed in the analysis. The results from the study shows that a long run relationship exists between tourism (either in terms of export share or capital investment) and both GDP per capita growth and employment in Nigeria. The study founds a direct and channelled impact of tourism sector development on economic growth in Nigeria. In particular, the strong employment effects of the sector over the long term also portends poverty alleviation capacity of the tourism sector in Nigeria. The study among others recommends the need to reduce the cost of inputs for the tourism sector and improve the regulatory environment in Nigeria.

Keywords: Tourism, Diversification, Economic growth

1.   Introduction

A strong and diversified export base is considered as essential for strengthening long run growth. The drive to diversify the economy away from the oil sector has therefore added to strong desire to develop the services sector in Nigeria. Nigeria has had an extreme case of exports concentration with fuels export representing no less than 86% of merchandise exports, and more than 76% of total exports (World Bank, 2022). It is however argued that export drive alone does not generate long run growth prospects, but what also "matters is the degree of diversification of such exports or of the export base" (Sannassee, Seetanah & Lamport, 2014). Proponents of such view often highlight the relevance of diversification in boosting overall sectoral contributions to growth (Imbs & Wacziarg, 2003) and stability of the economy (Balaguer & Cantavella-Jorda, 2002). For instance, Romer (1990) identified diversification as a major factor of production, while Acemoglu and Zilibotti (1997) observed that diversification may increase income by expanding the possibilities of spreading investment risks over a wider portfolio. Given the limited ability of the oil sector to increase domestic absorption and employment yields, the services sector is often considered as a strong aspect in ensuring diversification long run export growth in the Nigerian economy. The tourism sector provides a veritable avenue for promoting increased exports in the country.

Tourism has been a vehicle for diversification (both domestically and in the foreign market) in many developing countries. Although not all the economies have had successes in this area (Sharpley, 2002; Cattaneo, 2009), tourism constitutes considerable strategy for spreading economic benefits to a wider range of economic participants,

thereby reducing poverty levels (Croe, 2014). The increasing importance of tourism in some countries' exports also suggests that a successful diversification strategy could lead to an excessive concentration of exports in the tourism sector. As noted in the World Travel & Tourism Council (WTTC) report (2018), tourism (and travels) has become a leading economic sector among the countries of the world. This is because of the ease with which the sector can create jobs, and the sector's capacity to drive exports and generate sustainable welfare effects. In 2017, the sector accounted for 10.4% of global GDP and was able to create 313 million jobs, or 9.9% of total employment. Indeed, "over the past ten years, one in five of all jobs created across the world has been in the sector and, with the right regulatory conditions and government support, nearly 100 million new jobs could be created over the decade ahead" (WTTC, 2018). The sector is also the largest service sector industry in terms of world trade, accounting for about 6 per cent of world exports and contributing about 9 percent to world GDP (UNWTO, 2013).

The linkage of the tourism sector with employment and welfare improvements can also be demonstrated by considering that for every 30 new tourists to a destination one new job is created and that the travel and tourism industry has almost twice as many women employers as other sectors. Accounting for 30% of world services exports, and the largest export category in many developing countries, the industry is a tremendous employment generator. Yet research suggests that the industry's potential could be hindered and 14 million jobs could be at risk if governments and the private sector do not address the talent shortage in the industry.

In this study, we investigate the effects of tourism (as a means of economic diversification) on economic growth in Nigeria. The aim is to test the time-varying relationship between tourism sector factors and economic growth (with employment in Nigeria).

2. Literature Review
In this section, the concepts of tourism and growth and were examined as well as the nexus between these concepts. A quick review of the tourism sector was also examined with empirical literature concluding the section.

2.1. The Concepts of tourism and economic growth
There is no unanimous definition of tourism among researchers and professionals. However, Experts have defined tourism in different ways. Spillane (1982) asserted that tourism is an activity to visit some places with purpose to get the sport or rest, to finish the duty, etc. According to WTTC (2018), Tourism relates to the activity of travellers on trips outside their usual environment with a duration of less than one year. According to the United Nations World Tourism Organization (UNWTO, 2013), tourism is a social, cultural and economic phenomenon, which entails movement of people to countries or places outside their usual environment for personal business and professional purposes. Tourism is mostly associated with leisure trips and in many cases people do not necessarily remunerated from within the place visited. Meanwhile, a tourist is a person who travels to and stays in a place outside their usual environment for a limited duration, usually for leisure, recreation, or business purposes. The destination's hospitality, attractions, infrastructures and experiences of a tourist are all significant

features that determines their length of visits and whether or not they may want to visit again. The World Bank (2020), reported that prior to the COVID-19 pandemic, tourism was the world's largest service sector which provides one in ten jobs worldwide and about seven percent of all international trade.

Economic growth simply refers increase in national output in terms of goods and services within a specific period. Such increases can translate in higher employment rates, lower poverty rates, and improved standard of living among other social and economic indicators. According to Ivic, (2015), the concept of economic growth implies an annual increase of material production expressed in value, the rate of growth of GDP or national income. Economic growth can be enhanced by factors such as technological advancements, increases in productivity, investment in capital, improvements in infrastructure, and government policies that promote entrepreneurship and innovation.

These factors are necessary variables that supports tourism and its development. The tourism sector is a hospitality industry capable of providing employments. As it has been noted, tourism is considered as a sector of economic activity and such sector has potential to improve output. It is believed that among other sectors, tourism is one of the fastest growing industries in recent times providing millions of jobs to all categories of labour. Tourism has become a major source of income and employment in most countries, boosting revenue of the country, supports infrastructural development, exchange of cultural ties among others. Tourism offers opportunities for economic diversification and market-creation. (World Bank, 2020).

2.2. Tourism Sector in Nigeria

The tourism sector has a widespread range of effects that it delivers to an economy both in terms of income and employment. When the sector is well positioned, there are direct effects on the economy as well as other indirect effects, which indicate that the sector facilitates interlinkages with other sectors in the economy. Since tourism has to do with marketing of a country to the outside world, its development can also be linked with improvements in institutional settings for a country like Nigeria. The contributions of the tourism sector to employment is more closely related to poverty alleviation and long-term welfare improvements (Ghali, 1976; Croe, 2014). Figure 2.1 shows the total (actual) contributions of tourism to GDP as well as their growth rates in Nigeria since 1989. Although the value of the contribution has not been stable over the period, there is clear indication that it is on an upward trend. More importantly, the growth rates of the contributions are quite impressive. In terms of GDP, the contributions have reached over 60 percent in certain years. Considering that overall GDP growth has been modest (always below 10 percent) in Nigeria, such expansions in the tourism sector suggests that the sector has boosted overall growth in the economy over time. There have however been periods of poor growth in terms of contribution of the sector to GDP. For instance, the growth was -50.6 in 2007, -47.6 in 1999, and -30 in 2011. These are the years with the worst growth prospects in the tourism sector in Nigeria. Perhaps, it is not coincidental that these periods market the general election years in Nigeria when there has always been political uncertainty. Apparently political stability is a crucial contribution to the growth of the tourism sector in Nigeria.

Fig. 2.1. *Tourism Total Contribution to GDP*
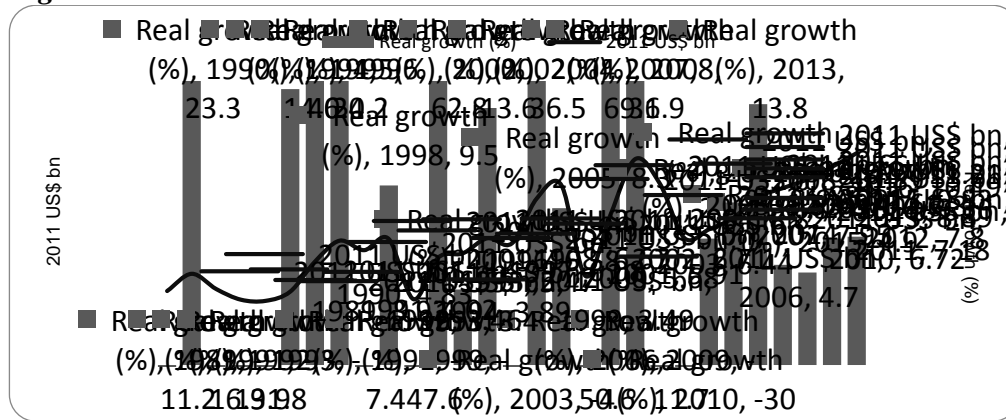
World Travel & Tourism Council (WTTC) (2018)

In relation to other countries of the world, the contribution of the tourism sector in Nigeria in terms of GDP and employment are presented in Table 2.2. In particular, the ranking of countries in terms of such contributions are reported for 2017. In terms of direct contribution to GDP, the Table shows that Nigerian ranked 159 in the world, behind Tunisia, Tanzania and Senegal, while Nigerian ranked 163rd in terms of total contribution to GDP. Many countries in Africa ranked much higher than Nigeria in terms of these contributions (the sub-Saharan Africa average was 6.1 percent, compared to 5.1 percent in Nigeria). For both contributions to GDP, the proportion was much smaller for Nigeria when compared to the World average, suggesting that the tourism sector in Nigeria lags behind in terms of its contribution to GDP ad economic growth. Given the potentials in the sector (as noted in the WTTC report of 2018 and Bankole, 2002), the potential of the sector can still be expanded to boost its share in annual GDP and ensure overall growth in the economy. In Table 2.2, the direct and total contributions of the sector to employment is shown for 2019 (note that the tourism took a strong hit during the Covid pandemic beginning from 2020). Nigeria also ranked poorly in this regard, with a share of 2.3 percent in direct contribution and 4.8 percent in total contribution. Both proportions were behind those of SSA and World averages, again confirming the less-than-desirable effort of the tourism sector in the Nigerian economy.

Table 2. 2: International ranking of tourism contributions in selected economies

| | Travel & tourism's contribution to GDP | | | | | | Travel & tourism's contribution to employment | | | | | | |
| | *Direct* | | | *Total* | | | *Direct* | | | *total* | | | |
Rank	Country	%	Rank	Country	%	Rank	Country	%	Rank	Country	%
31	Gambia	8.2	*37*	Gambia	20.1	*36*	Morocco	7.1	*43*	Gambia	17.2
32	Morocco	8.2	*40*	Morocco	18.6	*41*	Gambia	6.7	*44*	Morocco	16.4
39	Tunisia	6.9	*57*	Tunisia	14.2	*48*	Tunisia	6.3	*55*	Namibia	14
53	Egypt	5.6	*58*	Namibia	13.8	*72*	South Africa	4.5	*62*	Tunisia	13

65	Senegal	4.5	77	Egypt	11	81	Egypt	3.9	World		9.9
85	Tanzania	3.8	85	Senegal	10.4	84	Senegal	3.8	89	South Africa	9.5
89	Kenya	3.7	World		10.4	World		3.8	96	Senegal	9.1
World		3.2	95	Kenya	9.7	103	Kenya	3.4	98	Kenya	9
114	South Africa	2.9	103	Tanzania	9	104	Tanzania	3.3	106	Egypt	8.5
120	Namibia	2.9	107	South Africa	8.9	108	Namibia	3.2	109	Tanzania	8.2
SSA		2.7	SSA		6.1	SSA		2.3		SSA	5.8
159	Nigeria	1.9	163	Nigeria	5.1	163	Nigeria	1.8	162	Nigeria	4.8

World Travel & Tourism Council (WTTC) (2021)

2.3. Empirical review on tourism and economic growth

Literature on the effects of tourism on economic growth has existed for a long while. For instance, Ghali (1976) studied this relationship by measuring the contribution of tourism growth to the growth of income in Hawaii. This early study showed that tourism had generated significant growth in the country. On the other hand, Mamoozadeh and McKee (1990) cautioned on the possible "over-excitement" by developing countries in focusing on tourism as a growth agent in the long run. They warned the justification for incorporate tourism into their developmental strategies is "destination and/or location specific and should be assessed in keeping with perceptions regarding potential financial and economic impacts. If such perceptions are positive, then tourism may make sense provided that cultural and environmental impacts are assessed as acceptable" (p.155). Hazari and Sgro (1995) built a dynamic model and demonstrated that tourism spending would have a positive impact on the long-run growth of a small economy. They posited that tourism demand altered the consumption pattern of the locals by allowing them to consume now rather than later by requiring a lower savings rate. Balaguer and Cantavella-Jorda (2002) examined the contribution of tourism in Spain and found that tourism led to significant economic growth in the country. Also, using Lucas's (1988) two-sector endogenous growth model, Lanza and Pigliaru (2000) examined the tourist specialization of a small country and its effects on economic growth. They indicate that tourism appears as growth enhancing irrespective of the size of the country.

Empirical studies on the relationship between tourism and economic growth have been focused on the tourism-led growth hypothesis (TLG), where the causal and long run effects are established from tourism to growth. In this regard, Dristakis (2004) empirically examined the impact of tourism on the long-run economic growth of Greece by using a Multivariate Auto Regressive (VAR) for data from 1960:I-2000:IV. The study established a 'strong Granger causal' relationship between international tourism earnings and economic growth in the country. The positive and strong long-term relationship where also found to be true for Turkey by Ongan and Demiroz (2005). In contrast, Ozturk and Acaravci (2009) investigated the long-run relationship between growth and international tourism in Turkey during for the period 1987-2007. They found no unique

long-term or equilibrium relationship between growth and tourism, thereby disproving the TLG hypothesis for the Turkish economy.

Oh (2005) also extended the TLG analysis by investigating the causal relations between tourism growth and economic expansion for the Korean economy, using Engle and Granger two-stage approach and a bivariate Vector Autoregression (VAR) model. The study however found no long-run equilibrium relation between tourism and economic growth in Korea and that tourism growth is economic-driven and not the other way around. For the Taiwanese economy, Kim, Chen and Jang (2006) examined the causal relationship between tourism expansion and economic development. Using a Granger causality test, a long-run equilibrium relationship bi-directional causality was found between tourism and growth for the country, suggesting that tourism and economic development reinforce each other in Taiwan.

Croes (2014) assessed the poverty-reduction effects of tourism in developing countries "beyond its effects on growth" Employing the error correction model, the relationship between poverty and tourism spending was found to be insignificant for the developing countries although tourism development was shown to matter most for the poor at the lower levels of economic development. The findings from the two developing country case studies showed differing impacts of tourism development as well as the policy directions to be taken by developing countries in pursuing tourism development.

For the African region, Balcilar, van Eyden, Inglesi-Lotz and Gupta (2013) studied the effects of tourism on growth in South Africa by employed the rolling window and time-varying coefficient estimation methods to analyse the parameter stability and Granger causality based on a vector error correction model (VECM). They found that there is no Granger-causality between the tourism receipts and GDP in South Africa and although tourism receipts had positive-predictive content for GDP for the entire period, with the exception of the period between 1985 and 1990. In an analysis of the contribution of tourism to economic growth in SADC Countries, Makochekanwa (2013) demonstrated that the sector can constitutean engine of economic growth in SADC member countries. The study found that the contribution of tourism to GDP, employment, export receipts and investment was significant. Although this sector's contribution to the economy varies among SADC countries, the study found that Seychelles and Mauritius relied heavily on tourism as strong base on economic growth. For Nigeria, studies like Bankole (2002) and Adebayo, Jegede and Eniafe (2014) showed that tourism development has both macro-level and household welfare implications for growth in Nigeria. In particular, Mulkat and Mukail (2015) confirmed the tourism-led growth in Nigeria and found a unilateral causality and positive long-run between tourism development and economic growth. Ighodaro and Adegboye (2020) also found strong positive long run effects of tourism on both employment and growth in Nigeria.

3.0 Research Methodology
In this study, it is argued that tourism sector growth directly affects economic growth through capital investment in the sector, and indirectly through export diversification (or increased exports). Thus, these are presented in the following sub-sections

3.1. Theoretical framework

The economic implications of tourism are considered as related to all aspects of such trips as measured within the research. Thus, there could be wide aspects with respect to how tourism affects economic growth in a country. In this study, the theoretical framework is adopted from the model of the World Travel & Tourism Council (WTTC) (2007) and presented in figure 3.1 below. This framework demonstrate the growth applications of the tourism sector in a modern economy noting that tourism effects on growth are demonstrated to include direct, indirect and induced all combining to deliver strong growth effects. Direct contribution of the sector to GDP involves GDP generated by industries that deal directly with tourists, including hotels, travel agents, airlines and other passenger transport services, as well as the activities of restaurant and leisure industries that deal directly with tourists.

Fig. 3.1: Contributions of tourism to economic growth
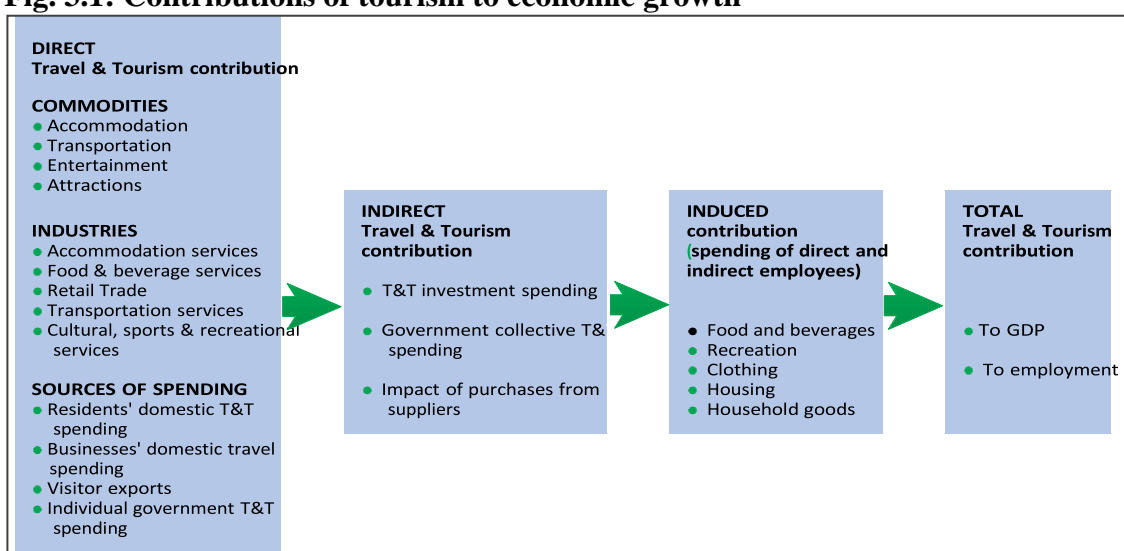
World Travel & Tourism Council (WTTC) (2007)

Direct contribution can also be observed in terms of employment generation as the number of direct jobs within travel and Tourism. The 'indirect' contribution of tourism to economic growth includes the GDP and jobs supported by:

   i.   Travel & Tourism investment spending – an important aspect of both current and future activity that includes investment activity such as the purchase of new aircraft and construction of new hotels;
   ii.   Government 'collective' spending, which helps Travel & Tourism activity in many different ways as it is made on behalf of the 'community at large' – eg tourism marketing and promotion, aviation, administration, security services, resort area security services, resort area sanitation services, etc;
   iii. Supply-chain effects manifested in domestic purchases of goods and services by the sectors dealing directly with tourists – including, for example, purchases of food and cleaning services by hotels, of fuel and catering services by airlines, and IT services by travel agents.

Induced impacts indicate the broader contribution to GDP and employment of spending by those who are directly or indirectly employed by travel and tourism.

Meanwhile, according to a UN (2018) report, the tourism sector can support growth in five key areas, including:

i. Inclusive and sustainable economic growth;
ii. Social inclusiveness, employment and poverty reduction;
iii. Resource efficiency, environmental protection and climate change;
iv. Cultural values, diversity and heritage; and
v. Mutual understanding, peace and security.

Moreover, UNWTO (2002) noted that the potential of the tourism sector as a development tool to positively contribute to economic growth emanates from the peculiar structure of the sector, especially since the industry represents an opportunity for economic diversification. In the same vein, the sector was noted to be the only "export sector where the consumer travels to the exporting country thus providing opportunities for the poor to become exporters through the sale of goods and services to foreign tourists". Given the extensive labour intensity of the sector, it has essential relevance to employment growth for developing countries with dual labour markets and other numerous indirect benefits of tourism for the poor.

3.2. Model Specification

The empirical strategy adopted in this study is dynamic analysis of the three main variables (tourism investment in capital, tourism export, and economic growth – or employment). This is structured as a simultaneous system in a Vector Error Correction Model (VECM) framework using annual time series data. This method, as also adopted by Guest and Swift (2008) and provides an elaborate platform for examining the interrelationships among the factors in Nigeria. Moreover, causality tests are carried out to determine the direction of causality among the variables. The system of equations representing the short run relationships which is estimated in the Johansen method is a vector error correction model (VECM) derived from a standard unrestricted vector autoregressive model (VAR) of lag length k. The VAR system of equations can be algebraically re-arranged into a VECM, written as:

$$\Delta z_t = \Gamma_1 \Delta z_{t-1} + \cdots + \Gamma_{k-1} \Delta z_{t-k+1} + \Pi z_{t-1} + \mu + \varepsilon \qquad (1)$$

where z_t is the vector of variables (here *gdppcg*, *texp* and *tcap* for the growth effects equation, and *emply*, *texp*, *tcap*, for employment equation) and μ is a vector of constants. The first group of terms on the right-hand side of (1), up to and including z_{t-k+1}, represents the short run lagged effects of differences in the three variables in z, or Δz, on each variable in the system.

The next term, Πz_{t-1}, is the error correction term (ECT) that represents the long run cointegrating relationships between the levels of the variables in z. This ECT term also represents the speed of long run adjustment in each of the equations. As all three variables are non-stationary, there should be more than one cointegrating relationships between them (Guest and Swift, 2008), with the number of cointegrating relationships given by the rank (r) of the matrix of long run coefficients Π. If at least one cointegrating relationship exists, Π can be factorised into $\Pi = \alpha\beta'$ where β' is the coefficients on the individual variables in the long run or cointegrating vectors, and α is the coefficient on

the ECT itself, which represent the speed of adjustment to disequilibrium (Johansen & Juselius 1990).

The Johansen procedure was selected for cointegration testing among the system of endogenous variables since the procedure also provides parameter estimates for all the cointegrating, or long run, relationships that may exist between the variables. To circumvent this problem, we employ the VEC lag exclusion Wald test in order to circumvent the high sensitivity of the Johansen method towards the choice of lags (Maysami & Koh, 2000). Moreover, the Granger causality/Block exogeneity Wald test is adopted to initially observe the causality between those three time variables.

4.0   Results and Interpretations

The empirical tools employed suggest that the time series properties of the data to be used are examined to ensure stability and time invariance in the estimated relationships. There is therefore need to investigate the stationarity of variables in our model. These and other preliminary examination of the data is carried out to observe the initial characterization of the data and their relational properties.

4.1.1. Descriptive Statistics

Descriptive statistics show the summary of data and other basic characteristics within the series. The annualized summary statistics for all the variables in the study are reported in Table 1 below. Average GDP per capita growth for the sample period is 1.15 percent which is relatively low considering the fact that this is an essential factor for sustainable long run growth in an economy (Harris & Jackie 1999; Solow, 1956). The maximum productivity growth of 30.36 percent and the minimum value of -15.45 percent give clear indications that the rate of growth has moved rather diametrically over the period of the study. This wide dispersion is confirmed by the relatively high standard deviation value for the variable. Apparently, income per capita growth has been generally unstable in the country of the years (Obadan & Odusola, 2000). The skewness value for the distribution is slightly high at 1.39 suggesting that the per capita GDP growth series were not quite centred around the mean value; the high kurtosis value also confirms this outcome. The Jarque-Bera value is significant at the 1 percent level, indicating that the hypothesis of normality in the distribution cannot be accepted. This implies that the data series may have endogeneity issues. This therefore necessitates adoption of a systems estimator which is capable of capturing the endogeneity effects.

Average employment growth rate in the economy is 1.81 over the sample period, with a standard deviation of 1.99. there is therefore indication that employment growth has been steady across the years in Nigeria, although the rate is generally low. The J-B test for employment growth also confirms that the data is normally distributed. Average rate of capital investment in the tourism sector is 3.68 percent while mean export share of tourism is low at 1.02. The dominance of the oil sector in total exports is apparently from the very low share of tourism. However, the average value of 1.02 indicates that the sector is relatively thriving in terms of export revenues in Nigeria.

Table 1: Descriptive Statistics

Variable	Mean	Max.	Min.	Std. Dev.	Skewn.	Kur.	J-B(prob.)
Per capita GDP growth	1.15	30.36	-15.45	7.15	1.39	9.71	0.00
Employment growth	1.81	7.13	-4.43	1.99	-0.79	5.83	0.00
Capital investment	3.68	11.2	1.4	2.60	1.38	4.30	0.00
Export contribution	1.02	2.98	0.129	0.67	1.66	5.61	0.00

Source: Authors' computations

4.1. Unit Root and Cointegration Analysis

Two tests of stationarity were employed in this study in order to analyse unit roots. The results are presented in levels and first differences. This enables us to determine, in comparative terms, the unit root among the time series and to obtain results that are more robust. Table 2 presents results of Augmented Dickey Fuller (ADF)and Philip-Perron (PP) tests in levels and first differences without taking into consideration the trend in variables. The reason for this is that an explicit test of the trending pattern of the time series has not been carried out. The results indicate that each of the variables possesses both ADF and PP values that are less than the 95 percent critical values for the level series and greater than the critical value for the differenced series. In all cases, the three variables in level form were non-stationary but their first differences were found to be stationary. That is, all variableswere I(1). It is therefore appropriate to use cointegration analysis to estimate the relationships between the variables, provided that the method chosen allows for the possible joint endogeneity of all three variables that is suggested by Guest and Swift (2008).

Table 2: Unit Root Test for Variables

Variable	ADF Test		Phillip-Perron Test		Order of Integration
	Levels	*First Difference*	*Levels*	*First Difference*	
Gdppcg	1.954	-45.14*	1.137	-37.67*	I[1]
t_exp	-2.329	-6.155*	-2.298	-6.157*	I[1]
t_cap	-0.808	-3.165*	-0.398	-6.038*	I[1]
Emply	-1.034	-5.458	-1.244	-10.48	I[1]

*Note: * indicates significant at 5 percent*
Source: Authors' computations

Given that the study focuses on error correction processes, test for acommon stochastic trend is also conducted in this study. This involves the existence of a cointegrating relationship between economic growth and tourism sector variables. This test also helps to confirm the application of error correction mechanism in the VAR estimation. The Johansen (1991) maximum likelihood cointegration method is used for this analysis

because the study involves the use of multivariate estimations. The test results indicate that the null hypothesis of no cointegration between the tourism receipts and GDP series is rejected at the 5 per cent significance level for both the λ-max and Trace test. Thus, a long run relationship is shown to exist between income per capita and tourism, as well as between employment and tourism.

Table 3: Multivariate Cointegration Test Results

Hypothesized No. of CE(s)	GDP per capita		Employment	
	Trace Statistic	Max-Eigen Statistic	Trace Statistic	Max-Eigen Statistic
None	36.13**	26.97**	24.73	21.52**
At most 1	9.17	5.29	3.21	3.11
At most 2	3.88**	3.88**	0.10	0.10

*** denotes rejection of the hypothesis at 1%significance level*
Source: Authors' computations

The Johansen test is highly susceptible to the lag structure of the VAR estimation (Maysami and Koh, 2000). Hence, arising from the cointegration observed from the Johansen test, we conduct the lag selection analysis employing the Wald lag exclusion test. Based on the significance level of the t-values for each lag structure, the result shown in Table 4 indicates that only one lag is expected to be retained for the VECM estimation.

Table 4: Wald Lag Selection Test

	d(gdppcg)	*d(t_exp)*	*d(t_cap)*	*d(emply)*	*Joint*
Lag = 1	31.22	11.39	28.49	33.26	68.81
t-value	[0.00]	[0.01]	[0.00]	[0.00]	[0.00]
Lag = 2	1.09	1.17	7.03	4.24	1.32
t-value	[0.61]	[0.76]	[0.07]	[0.21]	[0.70]
Lag = 3	4.31	7.06	3.67	4.01	3.09
t-value	[0.23]	[0.07]	[0.26]	[0.30]	[0.28]
Lag = 4	2.53	2.22	1.67	1.96	3.01
t-value	[0.61]	[0.71]	[0.66]	[0.62]	[0.29]

Source: Authors' computations

4.1.1. *Granger Causality Tests*
In Table 5, we show the test of the Granger Causality tests for the relationships among the variables. As is generally the case, the F-test is conducted on the null hypotheses in order to determine the direction of causality between each pair of variables. The rejection of each of the null hypothesis is based on the significance of the F-value for the particular relationship. We focus on the relationships that are of interest in the study. The test shows causality between a growth indicator (GDP per capita growth, employment, total value added, and services sector output) and tourism sector variable. Causality is shown to run from both value added and services sector output to tourism sector output share in GDP, but not the other way around, while the share Granger causes employment significantly.

This shows that expansion of the services sector and income levels tend to promote the tourism sub-sector in Nigeria. There is no form of Granger Causality between export share of tourism with economic indicator variables. In terms of capital investment, the result shows that causality runs from income per capita to such investment and from the investment to both value added output and services sector output.

Table 5: Granger Causality Test

Null Hypothesis:	Employment	Value added	Services	GDDPC
indicator → tc_gdp	1.10	4.96*	5.14*	4.89*
tc_gdp → indicator	8.21**	1.81	1.98	1.10
indicator → tr_exp	0.55	0.34	0.42	0.68
tr_exp → indicator	0.30	0.44	0.31	1.58
indicator → c_capital	0.65	0.00	0.01	2.71*
c_capital → indicator	0.88	3.90*	4.27*	1.85

*Note: * indicates significant at 5 percent*
Source: Authors' computations

4.1.2. VECM Results

The Block Exogeneity test reported above test does not provide information about the direction of the impact, nor the relative importance between variables that simultaneously influence each other. This is what the VECM results indicate as we analyse in this study. The long run β coefficients on the individual variables in the cointegrating equations for the relationships are given in Table 4.6. The cointegrating vectors are all normalised on the coefficient of GDP per capita and employment in order to facilitate comparison of the relationship since these are the variables of interest. For the two sets of equations, the coefficients of the presumed independent variables (tourism share in export and tourism capital investment) are negative in both standardized long run estimations. The long run coefficients in the results thus show a stable relationship between economic growth (and employment) and both tourism sector indicators.

Table 6 gives the α or speed-of-adjustment coefficients on the long run ECT in the error correction model (ECM) for each variable in the system. This coefficient further demonstrates that pattern of time-varying relationships between tourism sector and economic performance in Nigeria. ECT for all the equations possess the expected negative values that indicate tranquil long run adjustments. However, only the ECT for the *gdppc* and *t_cap* equations are significant. Apparently, *gdppc* and capital investment in the tourism sector will adjust more efficiently to long run equilibrium than the other variables. The general outcome however is that there are prospects for long run stability in both income growth and employment in Nigeria following any short run shock based on the influences from the tourism sector.

Table 6: Long Run Coefficients of the VECM

	gdppc	t_exp	t_cap	Emply	t_exp	t_cap
coefficients of cointegrating equation(β) – long run results	1.00	-0.98**	-0.79**	1.00	-1.24	-0.75
	-	(-7.42)	(-15.4)	-	(1.14)	(-3.66)
Equations of the system:						
Dependent variable	Δgdppc	Δt_exp	Δt_cap	Δemply	Δt_exp	Δt_cap
Coefficient on the ECT (α)	-1.29**	-0.01	-0.16**	-0.02	-0.28	-1.31**
	(-3.71)	(-0.32)	(-3.88)	(-1.19)	(-1.15)	(-4.39)
R^2	0.46	0.50	0.11	0.24	0.12	0.54
LM test for autocorrelation of the system: p-value = 0.615 *Doornik-Hansen test for normality of the system: p-value = 0.757*						

Note: ** indicates significance at 5 percent level;Source: Author's computations

Finally, we report the results of the Forecast Variance Decomposition based on the estimated VECM in Table 7. As noted in Nguyen (2011), Variance Decomposition "tells how much a given variable changes under the impact of its own shock and the shock of other variables" (p. 17). Therefore, the variance decomposition defines the relative importance of each random innovation in affecting the variables in the VECM.The variance decomposition is also performed for the two sets of equations (involving GDP per capita growth and employment). For the decomposition of employment, most of the variances are explained by itself over the period. This indicates that weak direct predictive power of tourism (either in terms of export share or capital investment) on total employment in the country. Only 8.39 percent of variances in employment was explained by capital investment after the fourth year. The decomposition of income growth is however quite different. Although a large proportion of variances in income growth was explained by itself over the period (88.6 percent in year 2 and 68.09 percent in year 4), the two tourism variables are explained strong proportions of the growth in income over the period. By the fourth year, capital investment explained 21.78 percent while export share explained 10.13 percent of total variances in income growth in Nigeria. It is therefore clear that tourism has a stronger direct impact on income growth than on employment in Nigeria. Moreover, capital investment in the tourism sector appears to exert more significant direct effects on both growth and employment than that of export contribution of tourism.

Table 7: Variance Decomposition Results

Period	TEMPL	TR_EXP	C_CAPITAL	GDPPCG	TR_EXP	C_CAPITAL
Variance Decomposition of TEMPLY:				*Variance Decomposition of GDPPCG:*		
1	100	0	0	100	0	0
2	97.41	0.06	2.53	88.60	6.90	4.50
4	91.88	0.63	7.49	76.67	12.02	11.30
8	91.17	0.42	8.41	70.06	10.60	19.34
10	91.22	0.39	8.39	68.09	10.13	21.78
Variance Decomposition of TR_EXP:				*Variance Decomposition of TR_EXP:*		
1	0.00	100.00	0.00	4.01	95.99	0.00
2	0.01	99.85	0.14	4.00	95.22	0.79
4	0.04	98.89	1.08	2.59	96.34	1.07
8	1.05	95.31	3.65	1.60	97.27	1.13
10	1.29	94.80	3.91	1.33	97.52	1.14
Variance Decomposition of C_CAPITAL:				*Variance Decomposition of C_CAPITAL:*		
1	1.52	2.44	96.04	2.86	0.04	97.10
2	11.24	20.40	68.36	10.87	5.53	83.60
4	12.14	62.58	25.29	37.19	21.85	40.96
8	9.78	75.70	14.52	42.03	28.43	29.55
10	9.57	77.15	13.28	42.63	29.13	28.24

Source: Authors' computations

In Table 7, the decompositions of both tourism export share and capital investment for employment and income growth equations are also shown. In the employment equation, the decomposition of export share of tourism indicates that neither employment nor capital investment contributed any significant effects on the variances of tourism export share. However, the decomposition of the variances in capital investment in the tourism sector shows clearly that export share plays very strong roles with contribution of 77.15 percent in the fourth year. His result shows that desire for higher tourism export revenue is the major factor that stimulates capital investment in the tourism sector. Similar results are indicated in the result from the income growth equation, confirming the robustness of the results.

5.   Summary, Conclusion and Recommendation

In this study, the effects of the tourism sector on economic growth in Nigeria was investigated. The procedure for the analysis involved a dynamic framework in establishing the long run relationships among the variables. The cointegration and VECM technique was employed. The results from the study shows that a long run relationship exists between tourism (either in terms of export share or capital investment) and both GDP per capita growth and employment in Nigeria. Moreover, the study found a direct and channelled impacts of tourism sector development on economic growth in Nigeria. In particular, the strong employment effects of the sector over the long term also portends poverty alleviation capacity of the tourism sector in Nigeria.

In order to strengthen the effects of the tourism sector on economic growth in Nigeria, there is need to improving the regulatory environment and reduce the cost of doing business in Nigeria. The services sector is largely dependent on the business environment in a country. Thus, factors such as cost of opening and operating a business is a key determinant of the one economy's capacity to diversify its production and exports in the services sector. Moreover, since the tourism sector "serves as an intermediary between the producer of a service/good and the consumer, e.g. food, beverages, electricity and water supply, telecoms" (Sannassee et al., 2014), there is need for reducing the cost of inputs for the sector. This could be done by way of either creating a domestic supply of inputs to compete with imports or reducing the cost of imports (by cutting tariffs and excise taxes on selected items essential to the tourism sector). Finally, other backbone services to the tourism sector should be developed in Nigeria. Easing the access to credit facilities as well as boosting electricity supply and expanding access to internet facilities will contribute tremendously to the competitiveness of the tourism sector in Nigeria since it is largely export driven.

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