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THE DYNAMICS OF TRADE, GOVERNMENT SIZE AND ECONOMIC GROWTH: NEW ECONOMETRIC EVIDENCE FROM NIGERIA

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Abstract

The main purpose of this study is to investigate the combined dynamic effects of trade liberalization and government size on economic growth in Nigeria while controlling for capital formation and consumption for the period 1981 to 2018. Based on theoretical and empirical literatures, the study employs cointegration and error correction techniques to test the relationship among the variables. Both the Augmented Dicky-Fuller and the Philip Peron unit root tests confirmed that the series contain unit roots but became stationary after first difference. The Johansen cointegration proves a long-run relationship among the variables. Empirical evidence from the long-run and error correction estimates show that trade liberalization

positively and significantly influenced economic growth in the short-run but had insignificant effect on economic growth in the long-run. Similarly, the size of government was found to have insignificant effect on economic growth both in the short-run and in the long-run. Gross fixed capital impacted growth negatively whether in the short-run or in the long-run. Finally, general consumption was insignificant explaining growth in the short-run but exerted a positive significant effect on economic growth in the long-run. The result of the pairwise causality shows uni-directional causality from trade liberation to GDP, from government size to GDP and from consumption to GDP. However, bi-directional causality is observed between government size and economic growth. The various diagnostic tests found the study to be stable and reliable. The study therefore recommends appropriate trade and fiscal policies to enable the country enjoy long-term gains associated with trade openness.

Keywords: Trade liberalization, Government Size, Economic Growth, Error Correction model

INTRODUCTION

In recent years there has been increased debate on the relationship among openness to international trade, the size of government and economic performance. Openness to trade is seen as catalyst to growth in an economy. International trade impacts economic growth through knowledge diffusion, technology transfer, competition, and flow of goods and services (Krugman and Obsfeld, 2000; Su, Nguyen and Christophe, 2019). Economic growth on the other hand is seen as a very good measure of performance in any given economy. As a measure of a country's development, economic growth can counter the negative effects of some macroeconomic problems like inflation, recession, unemployment, poverty, inequality among others (Nursini, 2017).

Meanwhile, openness of an economy to international trade will cause such economy to grow. Openness to trade creates wider markets for domestic firms across national borders, makes firms to be more efficient and competitive and to enjoy the economy of scale (Keho and Wang 2017, Okoye et. al 2016; Aigheyisi and Isikhueme, 2018). However, the growth effects of trade liberalization will be country specific (Zahonogo, 2016).

Countries that are open to external trades are prone to shocks from openness. Because of undue exposure to risks associated with growth in cross-border trade among nations, the increase in the size of governments becomes appropriate and optimal response to such risks by way of public insurance (Rodrik, 1998; Epitani and Gancia 2008). In that regard government is viewed as a safe sector in an open economy that provides citizens with a kind of protection against cross-border trade risks. This means that large-sized government is needed to play a

pivoting and stabilizing role in an open economy (Alesina and Wacziarg 1997; Fujii 2015)). This emphasizes the critical role of government in an open economy like Nigeria to act as a check against the vagaries of international trade exposure and associated risks to households and firms.

Many studies have either focused on the relationship between trade openness and economic growth (example Karras 2006; Saeed and Husain 2015; Mireku, Agyei and Domeher, 2017; Malefane and Odhhiambo 2019) or between the size of government and economic growth (see Mullick 2008; Mujahid, Alam and Bilgrami, 2015; Fuji, 2015) in both developed and developing nations. The third variant of literature focused on the combined effects of trade openness and government size on economic growth (see Morley and Perdikis 2000; Sabra 2016; Nursini 2017). The results arising from these studies are inconclusive depending on country specifics, measurement of variables and methodologies used.

In Nigeria, there are empirical studies on the relationship between trade openness and economic growth on the one hand (see Omoke 2010; Okoy et al 2016; Aigheyisi and Isikhuemen 2018), and the relationship between government size and economic growth on the other hand (Babatunde, 2011; Nwaogwugwu and Olenoghena, 2018; Onifade et al 2020). However, studies on the combined effects of trade liberalization and government spending on economic growth in Nigeria still needs to be explored.

This study intends to fill that gap. Again, there is mixed performance in terms of economic growth following alternative government trade and fiscal policy regimes from 1981-2018. This study therefore intends to investigate the interactive effect of trade (openness) and fiscal (government size) policies on economic growth within the period under review.

The study is divided into five sections. Following after this section, is section 2 which is literature review. Section 3 discusses econometric methodology and data set. Sections 4 deals with the discussion of empirical results while section 5 concludes the study with policy recommendations.

REVIEW OF RELATED STUDIES

Three selected strands of literatures will be reviewed in this section; first will be studies that focused on the impact of trade liberation on economic growth followed by those that studied the effects of government size on economic growth. Thirdly, studies that incorporated the combined effects of trade openness and government size on economic growth will be reviewed.

For the first set of literature, Aka (2006) explored the relationship among openness to trade, globalization and economic growth in Cote D'Ivoire in vector autoregressive framework. Among other findings, the study reported long run relationship among the variables in the

model. In the short-run, however, both globalization and trade openness had positive impact on economic growth while both maintained negative long-run effects on the economy of Cote D'Ivoire within the period. Karras (2006) studied the effects of trade openness on macroeconomic volatility using two data sets from 1951-1998 (for 56 countries) and 1960-1977 (for 105 countries) and concluded that both economic size and trade openness have negative and statistically significant impact on output (measured by GDP), consumption, investment and exchange rate volatilities across the two periods of 1951-1998 and 1960-1977 respectively. Omoke (2010) examined the causal relationship among financial development, trade openness and economic growth in Nigeria for the period 1970-2005. Employing Johansen cointegration and pairwise granger causality tests the study found no long run relationship among the variables. But financial development and trade openness were found to have causal impact on economic growth. In the same vein economic growth was reported to have granger-caused financial development and trade openness within the same period.

Saaed and Hussain (2015) evaluated the causal links among financial development, trade openness and economic growth for Kuwait using annual time series date from 1977 to 2012. The study adopted cointegration and granger causality tests in vector autoregressive framework. The empirical result supported trade openness-led growth as well as growth-led financial development. Mohsen and Chua (2015) tried to investigate empirical relationship between the roles of trade openness, population and investment in Syria from 1980 - 2010. Their study employed vector autoregressive (VAR) and Granger causality techniques. Empirical results reported a short-run bi-directional causality among the variables. The study also found a long-run uni-directional causality from trade openness to GDP among other findings. Okoye, et. al (2016) examined the relationship between economic liberalization and economic growth in Nigeria using annual time series data from 1986 to 2015 and utilizing ordinary least square (OLS) method to analyze the relationship. The study found mixed results. For instance, financial liberalization was found to have positive and significant impact on economic growth, trade openness and exchange rate were found to have non-significant impact on economic growth while Inflation had negative relationship with economic growth. Mireku, Agyei, and Domeher (2017) carried out an empirical investigation on the effect of trade openness on economic growth volatility in Ghana from 1970 to 2013, using cointegration and error correction econometric techniques to test the relationship. The results revealed that trade openness had negative influence on economic growth volatility both in the short-run and the long-run within the period under review. The study also found that credit to private sector volatility, shocks after Ghana's trade and financial openness had short-run negative impact on economic growth volatility. In a study based in Lesotho, Malefane and Odhiambo (2019) studied the dynamic

impact of trade openness on economic growth for the period 1979 to 2013. Utilizing Autoregrsessive distributed lag (ARDL) form of cointegration to test the four different indicators of trade openness which include export-import GDP ratio, export-GDP ratio, import-GDP ratio and trade openness index after accounting for country size and geography, the result confirms that both in the short-run and in the long-run, trade had no significant impact on economic growth regardless of the measures of trade openness.

The second strand of literature focuses on government size and economic growth. Mallick (2008) examined the impact of aggregate government spending on economic growth in India using structural vector autoregression methodology. The study found that government size (aggregate government spending) had no significant impact on the growth rate for the Indian economy. Alexion (2009) studied the impact of government spending on economic growth in seven transition economies in South Eastern Europe (SEE) from 1995 to 2005. The methods of the study were standard pooled OLS and Generalized Least Square methods with two sets of panel data. The results revealed that government spending on capital formation, development assistance, private investment and openness to trade had positive effects on economic growth. However, growth of population was found statistically insignificant explaining growth. Babatunde (2011) investigated the applicability of the Wagner's law for Nigeria from 1970 to 2006 based on bounds testing approach to cointegration, unrestricted error correction and granger-non causality tests. The result found no long-run relationship between government size and output in Nigeria. Altunc and Aydin (2013) tried to find the relationship between government spending and economic growth in Turkey, Romania and Bulgaria (focusing on the effect of optimal size of government on economic growth for the three countries). The study employed ARDL approach to cointegration to test the long run relationship among the variables. The long-run estimates confirmed the presence of army curve for the three countries. The study revealed that very high government size led to low level of growth while moderate government size had positive significant effect on economic growth. Nwanaogwugwu and Olenoghena (2018) explored the impact of government size and economic growth for Nigeria in Wagner's Hypothesis framework from 1970 -2014. Employing cointegration and error correction methods, the study found long-run relationship among the variables. The study also found long-un un-idirectional relationship running from economic growth to government expenditure. Overall, the study did not find support for Wagner's law in Nigeria within the period. Onifade et. al (2020) investigated the disaggregated impact of public spending (capital and recurrent expenditures) on economic growth alongside fiscal expansion in Nigeria from 1981 - 2017. The study implemented ARDL approach to cointegration and granger causality test to analyze the relationship among the variables. The findings reveal that while recurrent expenditure had significant negative impact

on economic growth, capital expenditures showed positive but insignificant impact on economic growth among other revelations.

Finally, literatures on studies that factor both trade and the size of government are reviewed. Using export as a measure of trade liberalization, Morley and Perdikis (2000) studied the joint impact of government expenditure, export (a measure of trade openness), investment and labour supply on economic growth in Egypt from 1955 – 1996, using cointegration and error correction techniques. The study found among other things, the existence of long run relationship among government expenditure, trade liberalization (export), investment and labour supply.

Fuji (2015) investigated the relationship that exist between the size of government, openness to trade and output volatility across fully integrated economies. The study applied Japan's regional income accounting and financial data, and reported negative association between trade openness and government size. Also the study reported limited evidence on the effect of government size on regional output in Japan. Mujahid, Alam and Bilgrami (2015) investigated the linkage among trade liberalization, the size of government and macroeconomic volatility in Parkistan from 1967-2010. Employing cointegration and vector error correction techniques, the study found that income and government size are positively related with output volatility but are negatively related with consumption and trade in the long-run. Sabra (2016) evaluated the interrelatedness between government size, country size, trade openness and economic growth. The study employed 2-stage Least Square and GMM system of analysis to analyze the relationship in 8 MENA (Middle East and North African) counties. Some of the main findings include a positive relationship between openness and economic growth while government size was found to be negatively with economic growth. Nursini (2017) investigated the impact of fiscal and trade policies on economic growth in Indonesia from 1995 to 2015 using different measures of fiscal policy. The result revealed among other findings that government expenditure on fiscal infrastructure and human capital had significant positive effect on economic growth when financed through tax revenue but showed negative effect on growth if financed through external borrowing. In addition, the study found that trade policies of Indonesia (trade openness) positively impacted her economic growth

RESEARCH METHODOLOGY

Empirical specification

Based on theory and empirical studies the model of this study is specified as follows:

$LGDP = \alpha_1 + \delta_1 LTL + ¥_1 LGS + \theta_1 LGFC + \phi_1 LCON + \varepsilon_t$ ---------- (1)

Where: LGDP= log of Gross Domestic product per capita, LTL is log of Trade Liberalization, LGS means log of Government size, LGFC is log of Gross fixed capital formation, and LCON is

the log of final consumption expenditure, while α_1, δ_1, $¥_1$, θ_1, ϕ_1 are the parameters to be estimated, ε_t represents the white noise stochastic error term.

Estimation technique

Data is first subjected to descriptive statistics. Second will be the examination of the stationary properties of the times series using the Augmented Dickey-Fuller and Philip Peron methods. Thereafter, the Johansen cointegration test, Error Correction model and Granger-causality will follow. The section concludes with diagnostic test to ascertain the stability and reliability of the model.

Order of Integration/Stationarity Test

It is important to examine the stationarity of time series because the inclusion of non-stationary regressors invalidates standard empirical results. Hence, the presence of stochastic trend is determined by testing the presence or otherwise of unit roots in time series variables (Saaed and Hussain, 2005). A time series is said to be stationary if its mean and variance are time invariant. That is ‘‘if its mean and variance are constant over time and the value of covariance between the two time periods depends only on the distance or lag between the two time periods and not on the actual time at which covariance is computed’’ (Gujarati, 1995). In this study both the Augmented Dickey-Fuller (ADF) and Philip Peron (Pp) tests apply. Accordingly, ADF is specified as follows:

$\Delta X = \psi_1 + \Lambda_1 X_{t-1} + \sum \beta_1 X_{t-1} + \mu_t$ ---------- (2)

Δ, represents the difference operator. ψ_1, Λ_1, an β_1 are the parameters to be estimated, While X is the time series whose properties are investigated. Similarly, the Philip Peron equation is captured thus:

$\Delta Y_t = a + bY_{t-1} + Z_t$ ----------(3)

Cointegration Test

Relying on Engel and Granger (1987), a linear combination of two or more non-stationary variables may be stationary. When such combination exists, it means that non-stationary time series are said to be cointegrated. According to Johansen (1991), the VAR based cointegration equation will be expressed as:

$Y_t = \delta_1 Y_{(t-1)} + \ldots + \delta_p Y_{t-p} + \beta X_t + \omega_t$ ----------(4)

Where Y_t is n-vector of I(I) series and X_t is vector of d-vector of deterministic variables while ω_t is a vector of innovations.

Granger Causality Test

Granger Representation theorem explains that if two variables say X_t and Y_t are cointegrated and each is individually I(I) series, then it is either X_t must Granger-cause Y_t or Y_t must Granger-cause $X_{t..}$ This causality is captured in Error correction model. Thus Granger-causality in ECM framework is expressed as:

$$\Delta LGDP_t = \propto_o + \sum_{t=1}^{\rho} \delta_1 \Delta LGDP_{t-1} + \sum_{t=1}^{\rho} \Phi_1 \Delta LTL_{t-1} + \sum_{t=1}^{\rho} \lambda_1 \Delta LGS_{t-1} + \sum_{t=1}^{\rho} \theta_1 \Delta LGFC_{t-1} + \sum_{t=1}^{\rho} \Psi_1 \Delta LCON_{t-1} + \beta_1 ECM_{t-1} + V_t \quad \text{----------(5)}$$

Where Δ and $\propto$ are the difference operator and intercept respectively. $\sum$ is summation, δ, Φ, λ, θ and Ψ are the parameters while β is the speed of adjustment that ties short run deviation to long run. ECM is the error correction representation while V_t is the shock or innovation.

Diagnostic Tests

In order to ensure the stability and reliability of the model, some diagnostic tests will be carried out such as Jacque Bera test to check for normal distribution, Autocorrelation LM test for serial correlation in the residuals, ARCH test to check for the presence of heteroscedasticity, Ramsey RESET test for specification bias and stability test through CUSUM and CUSUMQ.

Data Description and Sources

This study examines the dynamic relationship among trade liberalization, government size and economic growth in Nigeria from 1981-2018 while accounting for capital formation and consumption. The period was chosen because of availability of data. The sum of exports and imports as a percentage of GDP is used as a proxy for trade liberalization(TL), government size (GS) is captured by general government consumption expenditure as a ratio of GDP, capital formation is represented by gross fixed capital formation (GFC) as a percentage of GDP. Consumption is defined as general final expenditure as a percentage of GDP. Gross domestic product (GDP) is defined as GDP per capita at 2010 constant prices. All variables were sources from World Bank World Development Indicator 2020. The variables are log-transformed to reduce the effect of multi-collinearity.

EMPIRICAL RESULTS AND DISCUSSIONS

Descriptive statistics

The statistical properties of the variables are captured in table 1. From the table, the median, standard deviation, skewness, kurtosis and Jarque-Bera statistics are highlighted. From

the mean values, final consumption expenditure (LCON) has the highest mean (11.13) while trade liberalization (LTL) has the lowest mean (1.46).

Table 1: Statistical Properties of Included variables

	LGDPC	LTL	LGS2	LCON	LGFC
Mean	3.232758	1.464651	9.689003	11.12543	10.74225
Median	3.189751	1.530845	9.298965	10.99045	10.73213
Maximum	3.408901	1.726548	10.52661	11.49968	11.02142
Minimum	3.121985	0.960749	9.164822	10.75547	10.57654
Std. Dev.	0.103500	0.216970	0.563760	0.265389	0.092725
Skewness	0.517032	-1.072397	0.508481	0.189734	0.664177
Kurtosis	1.657000	3.121136	1.369685	1.395777	3.816636
Jarque-Bera	4.548816	7.306786	5.845886	4.302751	3.849744
Probability	0.102858	0.025903	0.053775	0.116324	0.145894
Sum	122.8448	55.65674	368.1821	422.7663	408.2055
Sum Sq. Dev.	0.396356	1.741804	11.75953	2.605968	0.318123
Observations	38	38	38	38	38

The size of government has the highest variability with a standard deviation of 0.56. Gross fixed capital has the lowest variability only deviating at 0.09 from the its mean. All the variables are positively skewed except trade liberalization which has a negative skewness. The Jaque-Bera statistics indicate acceptance of the null hypothesis of normality for all the variables except trade liberation whose probability value is less than 0.05. Overall, this means that the model is normally distributed.

Order of Integration

Table 2 contains the result of the stationarity properties of the variables entering the model. Both the Augmented Dickey-Fuller (ADF) and Philip Peron (PP) tests were deployed. The two tests indicate that all the variables are stationary at first difference. That is, they all I(I) series.

Table 2: Unit Root Table (*Eviews 9 output*)

	ADF		Philips-Peron		
Series	Level	First Diff.	Level	First Diff.	Order of Integration
LGDP	-0.879964	-3.826250**	-0.263896	-3.826250**	I(I)
LTL	-1.869231	-7.252514**	-1.869231	-7.265305**	I(I)
LGS	-0.553560	-6.222745**	-0.620660	-6.232529**	I(I)
LGFC	-2.361029	-4.873881**	-0.505242	-5.443490**	I(I)
LCON	-0.178092	-6.620949**	-0.034655	-6.799338**	I(I)

Note: *means significant at 1%, ** significant at 5% *** significant at 10%

Lag Selection Criteria

It is important to select optimal lag length empirically, using the appropriate lag length selection criteria. This is necessary because under parameterization and over parameterization may lead to estimation bias and loss of degree of freedom, respectively. To avoid that, the optimal lag length will be selected using the following criteria in a VAR framework; Sequential Modified Likelihood Ratio (LR), Final Prediction Error (FPE), Akaike Information Criterion (AIC), Schwartz Information Criterion (SIC) and Hannan-Quin Information Criterion (HQ).

Table 3: VAR Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	151.1317	NA	2.05e-10	-8.118428	-7.898495	-8.041666
1	299.8578	247.8768*	2.16e-13*	-14.99210*	-13.67250*	-14.53152*
2	316.9008	23.67086	3.65e-13	-14.55004	-12.13078	-13.70566

* indicates lag order selected by the criterion

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

FPE: Final prediction error AIC: Akaike information criterion

SC: Schwarz information criterion HQ: Hannan-Quinn information criterion

The table 3 shows that lag 1 was selected by all criteria (LR, FPE, AIC, SC, HQ). This means that the optimal lag length is 1. Therefore lag 1 is applied to estimate the model.

Cointegration Result

Having addressed the order of integration of variables relating to the presence of unit root and found that all variables are integrated of first order i.e. I(I) series, Johansen cointegration test is employed. From the results of the cointegration tests both the Trace and Max Engen statistics indicate one cointegrating equation at 5 percent level of significance. Tables 4 and 5 contain the trace and engenvalue results.

Table 4: Unrestricted Cointegration Rank test (Trace)

Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.612952	74.23026	69.81889	0.0213
At most 1	0.383040	40.05886	47.85613	0.2204
At most 2	0.327495	22.67264	29.79707	0.2625
At most 3	0.172818	8.389810	15.49471	0.4247
At most 4	0.042395	1.559516	3.841466	0.2117

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

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

Table 5: Unrestricted Cointegration Rank Test (Maximum Engenvalue)

Hypothesized		Max Engen	0.05	
No. of CE(s)	Eigenvalue	Statistics	Critical Value	Prob.**
None *	0.612952	34.17140	33.87687	0.0461
At most 1	0.383040	17.38621	27.58434	0.5469
At most 2	0.327495	14.28283	21.13162	0.3423
At most 3	0.172818	6.830294	12.26460	0.5994
At most 4	0.042395	1.559516	3.841466	0.2117

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

* denotes rejection of the hypothesis at the 0.05 level

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

This leaves the conclusion that the variables are cointegrated, suggesting that the variables may share long-run relationship.

Long Run and Error Correction Models

Table 6 is the long-run equation whose residual enters the dynamic model as the error correction which ties the short-run variables to their long run information.

Table 6: Long Run model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.824788	0.368444	2.238570	0.0325
LGDP(-1)	0.841545	0.106617	7.893173	0.0000
LTL(-1)	0.021179	0.014722	1.438550	0.1603
LGS(-1)	0.009275	0.013910	0.666782	0.5098
LGFC(-1)	-0.108975	0.035636	-3.058033	0.0046
LCON(-1)	0.066594	0.035419	1.880188	0.0695
R-squared	0.983713	Mean dependent var		3.232536
Adjusted R-squared	0.981086	S.D. dependent var		0.104919
S.E. of regression	0.014429	Akaike info criterion		-5.491734
Sum squared resid	0.006454	Schwarz criterion		-5.230504
Log likelihood	107.5971	Hannan-Quinn criter.		-5.399638
F-statistic	374.4758	Durbin-Watson stat		1.885524
Prob(F-statistic)	0.000000			

The result shows that past value of GDP per capital and the general consumption expenditure had positive and significant impacts on economic growth in the long-run, while trade liberalization and government size were insignificantly related to growth in the long-run. However, gross fixed capital formation had negative and significant effect on economic growth.

Table 7: Short-Run model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.000333	0.002533	-0.131539	0.8963
D(LGDP(-1))	0.981285	0.252656	3.883879	0.0005
D(LTL(-1))	0.055723	0.019684	2.830838	0.0083
D(LGS(-1))	-0.003107	0.019619	-0.158370	0.8753
D(LGFC(-1))	-0.153757	0.064873	-2.370110	0.0246
D(LCON(-1))	0.032863	0.061433	0.534938	0.5968
ECM(-1)	-0.966758	0.278468	-3.471708	0.0016
R-squared	0.587979	Mean dependent var		0.005013
Adjusted R-squared	0.502734	S.D. dependent var		0.019573
S.E. of regression	0.013802	Akaike info criterion		-5.555324
Sum squared resid	0.005524	Schwarz criterion		-5.247417
Log likelihood	106.9958	Hannan-Quinn criter.		-5.447856
F-statistic	6.897472	Durbin-Watson stat		1.825725
Prob(F-statistic)	0.000126			
Diagonistic Tests:				
JB (Norm.)	**1.023129 (0.5996)**			
LM (Serial Corr.)	**0.838260 (0.3677)**			
ARCH (Hetero.)	**1.484274 (0.2184)**			
Ramsey Reset Test (Spec.)	**0.017926 (0.9858)**			

The estimates of the short-run dynamics are presented in table 7. From the results past values of GDP and trade liberalization (0.98 and 0.06) have positive significant effects on economic growth. This means that both the past value of GDP and trade liberalization positively influence economic growth in the short-run. From the result also, government size had insignificant impact on economic growth. Gross capital formation impacted growth negatively while general consumption expenditure did not show any significant effect on economic growth. Interestingly, the error correction model confirms the result of the cointegration. This can be seen from the value of the error term (ECM-1) which is negative (-0.97) and statistically significant at 5 percent level. This means that 96.7 percent of the previous year's deviation will be corrected or restored within a year.

Table 8: Pairwise Granger Causality

Null Hypothesis:	Obs	F-Statistic	Prob.
LTL does not Granger Cause LGDP	37	10.2313	0.0030
LDPC does not Granger Cause LTL		0.32355	0.5732
LGS does not Granger Cause LGDP	37	9.50256	0.0041
LGDP does not Granger Cause LGS		1.87449	0.1799

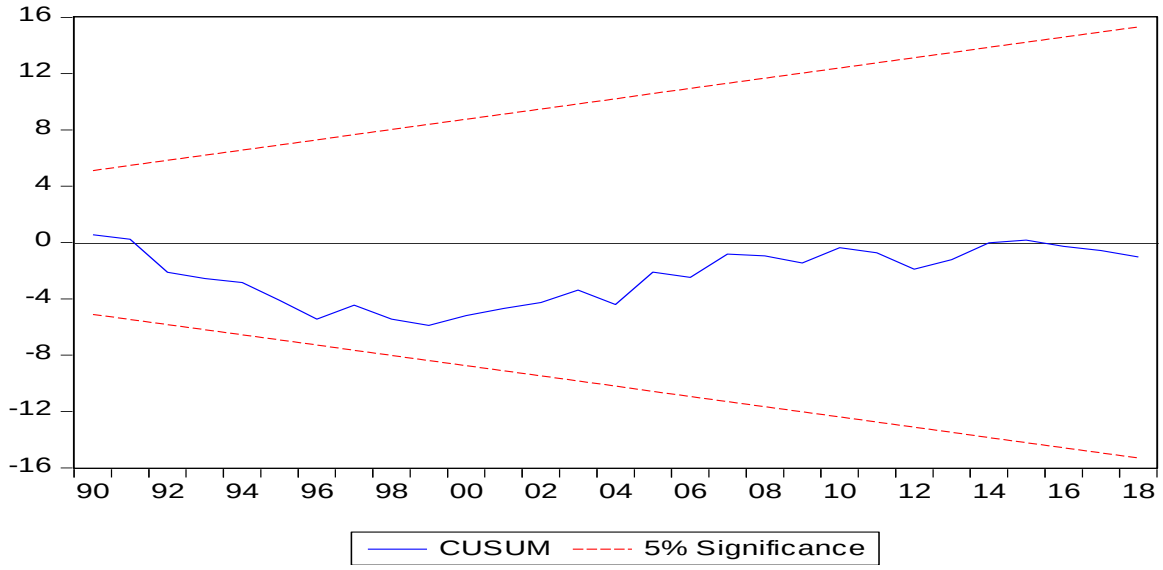
LGFC does not Granger Cause LGDP	37	18.2261	0.0001
LGDPC does not Granger Cause LGFC		12.5325	0.0012
LCON does not Granger Cause LGDP	37	21.4406	5.E-05
LGDPC does not Granger Cause LCON		1.25672	0.2701

Table 7…

Results of the diagnostics are also captured in the table 7. The model satisfies the normality condition. The result of the normality test captured by the p-value of the Jaque-Bera (0.5996) is greater 5 percent. This means that the model is normally distributed. The LM test shows that the model is not suffering from serial correlation. The p-value of ARCH test (0.2184) which is greater than 0.05 shows that the model is not heteroscedastic. Finally, the Ramsey RESET test shows that the model is correctly specified and does not suffer from any specification bias.

Table 8 shows the result of the pairwise causality among the variables. The results indicate unidirectional causality running from trade liberalization to GDP, from government size to GDP and from consumption to GDP. However, bidirectional causality is observed between government size and economic growth.

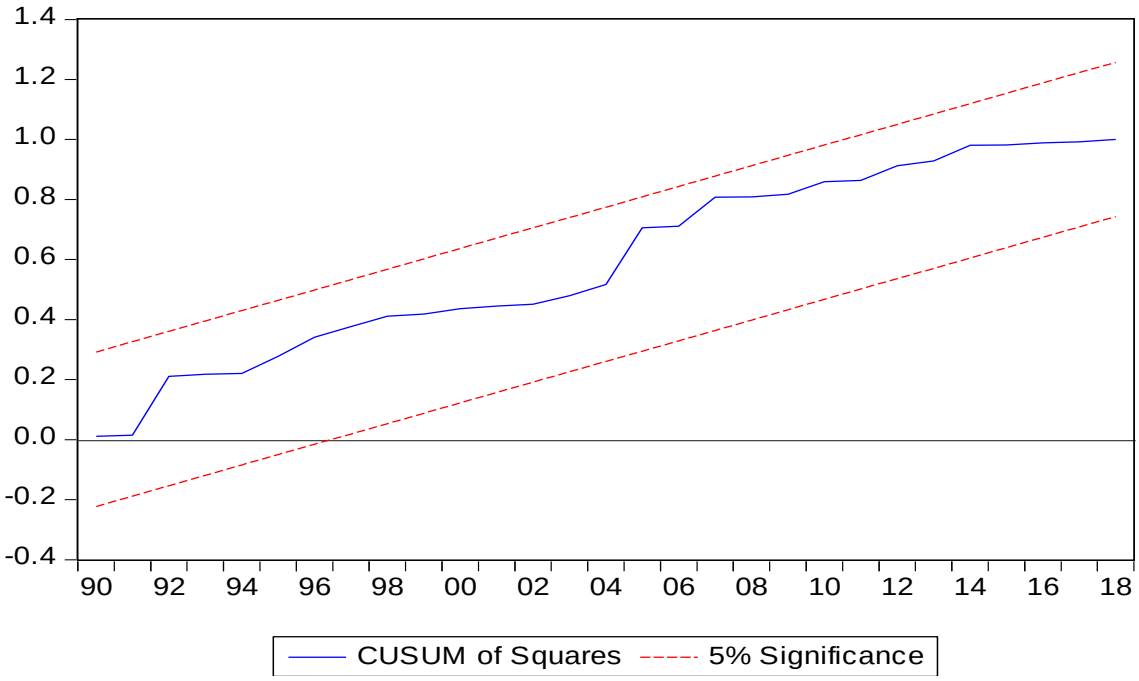
Figure 1: Cumulative sum (CUSUM) test



Stability Test

From the results of the CUSUM and CUSUMQ the model passes the structural stability test. This means the result can be relied upon in making forecast or taking decisions. The results are seen in figures 1 and 2. Overall, the results show that the model is well behaved.

Figure 1: Cumulative sum of square (CUSUMSQ) test



CONCLUSION AND POLICY IMPLICATION

The study investigated the effects of trade liberalization and the size of government on economic growth in Nigeria from 1981 to 2017 employing Johansen cointegration and error correction techniques. The study also performed relevant diagnostic tests such as normality, Ramsey Reset, Jacque Bera, Heteroscedasticity, as well as CUSUM and CUSUMQ to ascertain normality, stability and reliability of the model.

The results reveal that trade liberalization had statistically significant negative impact on economic growth in the short-run while showing insignificant impact on economic growth in the long-run. Both in the short-run and in the long-run government size had insignificant effect on economic growth. Also general consumption expenditure positively and significantly impacted on growth in long-run. Similarly, gross capital formation was found to have short run and long run negative effect on economic growth within the period. The result granger causality shows uni-directional causality running from trade liberalization to GDP, from government size to GDP and from consumption to GDP. However, bi-directional causality is observed between government size and economic growth.

The implication of negative or insignificant effects of trade and government spending on economic growth suggest that trade and fiscal policies in Nigeria have not been structured in such a way as to cause the economy to benefit maximally from the gains of openness to trade.

Therefore, policy makers should endeavor to evolve and implement trade and fiscal policies that will boost economic growth and development.

LIMITATIONS

The study did not factor in some explanatory variables such as oil price and population growth whose presence are likely to influence the result differently. Asymmetric analysis of this model will separate the effects of positive and negatives changes of trade and government size on economic growth. This study did not undertake such analysis. Further study should extend the scope to the year 2020.

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