

ARDL Modeling of Long-Run and Short-Run Determinants of Export Performance in Nigeria: A Test for National Development

N. I. Etukafia (PhD) & J. O. Udoidem (PhD)

Department of Banking and Finance, University of Uyo, Uyo, Nigeria.

Abstract

This article seeks to estimate long-run and short-run implications of domestic macroeconomic variables on the performance of exports in Nigeria between 1981 and 2015. Central Bank of Nigeria published data were used for analysis. The bounds test and auto-distributed regressive lag (ARDL) modeling technique was adopted to estimate both short-run and long-run corollary of the explanatory variables on export performance in Nigeria. Results of the long-run behaviour of the explanatory variables on the responsive variable (export performance) were insignificant. However, results from ECM (short-run dynamics) were quite beguiling because of the observed inconsistencies which are indication of contradictory policy framework characterizing the Nigerian economic scenery. Therefore, it is recommended that conscious efforts be devoted to the crafting of long term plans and policy formulation and implementation for the attainment of long term and enduring stabilization and export growth.

Keywords: Exports, liberalization, import, exchange rates, inflation rates, government expenditure, autoregressive distributed lag, bound test.

1. Introduction

It is a truism that export is an important factor of economic growth for both developed and developing economies. According to Idowu, (2005) and Lin & Li (2007), economic growth depends highly on production and export. There is no economy that produces for only domestic utilization. The fundamental interest for production in any economy is to export to make foreign earnings. The developing economies, such as the sub Saharan countries, struggle to produce for domestic consumption and export to grow. International financial analysts opine that countries should always target to dominate others through export. They suggest acceleration of export with vigour while import should be discouraged. This idea is supported by import substitution policy of which India's transition to a globally oriented economy has been accelerated (Subho, 2017).

This fundamental source of growth is embedded in the trade theory of protectionism. Trade protection becomes paramount in the macroeconomic policies of nations to enhance 'haul much and disburse little'. This position is supported by Chen (2007). He established the link between export and growth in Taiwan. It is believed that export of goods and services represents one of the most important sources of foreign exchange income that ease the pressure on balance of payment and create employment opportunities, increase productivity and enhance the living standard of the people (About-Stat, 2005; Medina-Smith, 2001; Shirazi, 2005). Nigeria is not left out of implementing policies that encourage export. In addition to adopting economic policies that stimulate growth through export, Nigeria is endowed

with natural economic resources which place the country in better position of production disparity against others. Particularly, Nigeria has enjoyed the comparative advantage in producing crude oil over many countries of the world thereby exporting the product.

Though production and export in Nigeria, such as in other sub-Saharan nations, are mainly on primary (unfinished) products, many low income countries have been transformed to middle income countries through the process of industrialisation. Such countries include: Singapore, Malaysia and South Korea. Mechanized agricultural method and industrialised agro-allied businesses have the capacity to transform a nation (Nto & Mbanasor, 2011).

Successive governments in Nigeria, since independence, have been formulating macroeconomic policies with expectation to grow via export. These policies directly affect macroeconomic variables such as Interest rate, exchange rate, taxation, openness of the economy and government expenditure that in turn influence export performance vis-à-vis growth. Fiscal and monetary policies are often employed either by expansionary measure or tight measure depending on the direction government aims to influence the macroeconomic factors in order to favour domestic production to enhance consumption of domestic goods as well as export. Recently, government has adopted fiscal and monetary measures to impact on diversification of economic resources. The aim is to develop non-oil sector. This policy is to take the country out of mono economic practice since discovery of oil.

The formulation and implementation of macroeconomic policies aimed at impact directly on macroeconomic variables to favour export in Nigeria is as old as independence, yet the resulting effect on export performance is not clear. The term of trade is usually unfavourable, as trade balance is every year poor, and foreign reserve is often low with perennial deficit balance of payment. This scenario generates doubt about the efficacy of the macroeconomic policies on the macroeconomic environments that influence export in Nigeria, thus the interest to investigate the relationship between macroeconomic factors and export performance in Nigeria.

The main objective of this work is to investigate the impact of macroeconomic factors on export performance in Nigeria. Other specific objectives are to examine macroeconomic policies formulated and implemented in Nigeria from 1981 to 2015; to identify the major macroeconomic factors influenced by the economic policies; and to assess the effect of the macroeconomic factors on export performance. To sharpen the focus of the study, we hypothesize that there is no significant effect of macroeconomic environments on the performance of export in Nigeria.

2.0 Review of Related Literature

2.1 Conceptual Issues

Macroeconomics generally study aggregate economic issues. It is a unified concept of documenting facts, formulating model about the facts, analysing the model, testing it and using the result to make predictions. Such predictions become useful in making economic policies to influence economic factors. The subject matter of this study is “Macroeconomic factors as determinants of export performance”. Invariably, it means economic policies influencing the performance of export since economic factors are affected by the policies. Government formulate and implement policies as the way out to solving the economic problems. Such as unemployment, price instability, unstable growth, balance of payment problem, inflation and deflation, recession and depression (Anthony *et al*, 2012; Brue & McConnel, 2005 and Essien, 2002).

Macroeconomics is prone to injecting fresh ideas and valid insights into the operation of the economic system. The great depression between 1929 and 1933 which the classical economics of the time could not develop theory to explain and find solution to the situation paved way to the popularity of John Maynard Keynes in 1936. He applied macroscopic view of the economic system and showed that there was insufficient aggregate demand as well as the fact

that active stabilization policy was needed to maintain good economic performance (Onoh, 2013). This gave rise to adoption of fiscal policies by economies as measure of stabilization of economic growth.

However, the neoclassical economists, particularly, the monetarists maintain their position on market mechanism. They believe in the use of monetary policies to achieve growth stabilization. Consequently, economies all over the world rely on two major instruments of growth stabilization that form the basis of macroeconomic policies – the fiscal and monetary policy measures. These two approaches could be used as formulated by government to influence economic factors either by expansionary measures of contractionary measure to achieve the expected aim (Ray, 2012 and Enu & Attah-Obong, 2013).

2.2 Fiscal and Monetary Policies in Nigeria and Export – Led Growth

(a) Fiscal Policies:

The major fiscal policies commonly used in Nigeria include changes in taxation rates and government expenditures. Government do adjust taxation rates to cause contraction of money in circulation or expansion to achieve its objectives. This could be done through adjustment of personal income tax, company income tax, petroleum profits, capital gains, import duties, export duties and excise duties. These adjustments, most of the time is done to favour trade structure that is required for economic growth. (Lederman & Maloney, 2003; Jarra (2013).

Import substitution policy is in place in Nigeria to encourage more of exports. Presently, government is implementing policy of diversification of the major source of foreign earnings (oil) to encourage export of other commodities, especially, agricultural commodities (<http://www.nigerianstat.gov.ng>). There is a range of legislative and regulatory provisions to affect all services export in Nigeria. This is in line with the ideas of (Hellyer, 2012 and Abbas, 2012). Government is attempting to ensure availability of human capital, ensuring competitive delivery system, easing consumer’s access to the market and in line with global practice improve on information technology (World Bank, 2009).

In order to actively articulate and promote implementation of export-led growth policies and programmes, government is attempting to establish the Nigerian Export Promotion Council strategies for export of Nigerian goods (www.google.com.ng/search?q=government+policies+to+encourage+export&btnmng=).

(b) Monetary Policy:

Monetary policy involves measures designed to regulate and control the volume, cost, availability and direction of money and credit in an economy to achieve some specified macroeconomic policy objectives (Michaly, 2007). He opines that it is a deliberate effort by the monetary authorities to control the money supply and credit conditions for the purpose of achieving certain broad economic objectives. Monetary policy in Nigeria encompasses actions of the Central Bank of Nigeria (CBN) that affect the availability of cost of banks reserve balances and thereby the overall monetary and credit conditions in the economy. The aim of monetary policy measures could be achieved through either direct policy tools or indirect tools.

Direct tools involve imposition of restrictions directly on the financial institutions such as direct credit ceilings, exchange control, requirement of special deposits and others. On the other hand, indirect policies involve rules and regulations that indirectly affect the operations of the institutions. Such regulations include decision on cash reserve ratio (CRR), liquidity ratio (LR), monetary policy rate (MPR), and open market operation (OMO). Direct monetary policies were in vogue in the 1960s, 1970s and early 1980s until 1986 when deregulation was introduced in the Nigerian economy. Indirect monetary policy measures has become the main instruments of handling issues of monetary phenomenon such as inflation, price instability, and money supply to achieve the major macroeconomic goal of growth stability.

Presently, direct method of CBN special monetary interventions has been employed in reversing recession. These include funds targeting lending to Small and Medium Scale Enterprises (SMEs), agriculture, power, and non oil exports (Akintunde, 2017). He noted that United States of America has used internet cuts as one of the measures to fight recession when the first Persian Gulf War and rising inflation combined to plunge the US economy into recession in the 1990s. In line with the US, Nigeria has applied internet cut to achieve its macroeconomic objectives of economic growth; though in turn it may become a driver of inflation if not checked. Both fiscal and monetary policies discussed are employed to affect the macroeconomic environments directly with expectation that in turn should impact on export.

3.0 METHODOLOGY

This study is designed to evaluate the contributions of these dynamic variables {(imports (IM), government expenditure (GXP), economic liberalization (ELIB), inflation (INF) and exchange rates (EXR)} on export

performance (EX). Thus, we specify the model that estimate the effects of these factors on exports, and thus, cast the empirical model in the form:

$$EX = f(IM, GXP, ELIB, INF, EXR). \quad (1)$$

We linearized equation (1) and incorporate a stochastic white noise, while an explicit econometric model is expressed for estimation as follows:

$$\ln EX = \psi_0 + \pi \ln IM + \phi \ln GXP + \lambda \ln ELIB + \delta \ln INF + \delta EXR + \varepsilon_i \quad (2)$$

In this section, an empirical techniques deployed to examine the effect of determinants of exports in Nigeria are analyzed. We utilize the Auto-Regressive Distributed Lag (ARDL) modeling, which is also referred to as bound testing approach. This approach was developed and made popular by Pesaran, Shin and Smith (2001). The ARDL modeling technique is a least square regression that contains lags of the dependent and independent variables and typically denoted with notations p, q_1, q_2, \dots, q_n , where p is the number of lags of the dependent variable, q_1 is the number of lags of the first explanatory variable, and q_n is the number of lags of the n -th explanatory variables. INF and EXR are not transformed to natural logarithm as other variables are because there are rates already. Thus, we express the ARDL model as:

$$y_t = \alpha + \sum_{i=1}^p \theta_i y_{t-i} + \sum_{j=1}^k \sum_{i=0}^{q_j} \beta_{j,i} X_{j,t-i} + \varepsilon_i \quad (3)$$

In practice, we would not lag all the explanatory variables, X_j since some of them may have no lagged terms in the model ($q_j=0$) because they are characteristically static or fixed regressors. While using ARDL to estimate the dynamic relationship between regressand and regressors, we at the same time transformed the model into a long run representation to show the long run response of the dependent variable to variations in the explanatory variables. The estimated long run coefficient is expressed as:

$$\theta = \frac{\sum_{i=1}^k \beta_{j,i}}{1 - \sum_{i=1}^p \theta_i} \quad (4)$$

The conventional procedure adopted in the estimation of cointegrating relationships, such as Johansen's (1991, 1995) processes require all variables to attain stationarity at 1(1), or require earlier understanding or knowledge and specification of which variables are stationary at 1(0) and 1(1). To mitigate the effect of

this apparent shortcoming, Pesaran, Shin, and Smith (1999) suggested that cointegrating techniques could be estimated as Auto Regressive Distributed Lag (ARDL) models that would not attach importance to the level of stationarity property of the series even if the series are either 1(1) or 1(0) without pre-specification whether they are 1(0) or 1(1). Furthermore, it is important to stress that ARDL does not require equilibrium lag lengths from all the variables as each variable can have different number of lag terms. Thus, the cointegrating form of an ARDL model is obtained by transforming eq. 3 into difference equation and substituting the long run coefficients from eq. 4, thus obtaining:

$$\Delta y_t = - \sum_{i=1}^{p-1} \gamma_i \Delta y_{t-i} + \sum_{j=1}^k \sum_{l=0}^{q_j-1} \Delta X_{j,t-l} - \theta EC_{t-1} + \varepsilon_i \quad (5)$$

Drawing from Pesaran, Shin and Smith (2001), eq. 5 is deployed to ascertain existence or otherwise of long run cointegrating equilibrium relationships in the ARDL model. Upon establishing the existence of cointegrating equation, we further proceeded with the bound testing procedure and transform eq. 5 into the following representation:

$$\Delta y_t = - \sum_{i=1}^{p-1} \gamma_i \Delta y_{t-i} + \sum_{j=1}^k \sum_{l=0}^{q_j-1} \Delta X_{j,t-l} - \beta_j t - \rho y_{t-1} - \sum_{j=1}^k X_{j,t-1} \alpha_j + \varepsilon_i \quad (6)$$

Following from eq.2, the ARDL representation of the export performance function is empirically expressed as:

$$\Delta ex_t = \pi_0 + \pi_1 ex_{t-1} + \pi_2 im_{t-1} + \pi_3 gxp_{t-1} + \pi_4 elib_{t-1} + \pi_5 inf_{t-1} + \pi_6 exr_{t-1} + \sum_{i=1}^q \alpha_i \Delta ex_{t-i} + \sum_{j=1}^q \alpha_j \Delta im_{t-j} + \sum_{k=1}^q \alpha_k \Delta gxp_{t-k} + \sum_{l=1}^q \alpha_l \Delta elib_{t-l} + \sum_{m=1}^q \alpha_m \Delta inf_{t-m} + \sum_{n=1}^q \alpha_n \Delta exr_{t-n} + \varepsilon_i \quad (7)$$

where Δ is the first difference of variable, π_0 = regression constant, q = maximum lag length, while $\pi_1, \pi_2, \pi_3, \pi_4, \pi_5, \text{ and } \pi_6$ are short run dynamics. Similarly, the “ t ” is the time trend, whereas ε_i represents stochastic white noise.

existence of long run relationship between the explanatory variables and dependent variables. However, if the F-statistic lies between the upper-bound critical value (limit) and the lower-bound critical value (limit), the result is inconclusive

While modeling the long run and the short run relationship between export performance and the selected variables, it is theoretically imperative to examine the existence of cointegrating relationship between the variables. The deployment of the computed F-statistic constitutes the basis for determining the existence of equilibrium long run relationship. Following from Pesaran, Shin and Smith (2001), two discernible sets of critical values for different numbers of variables that contain an intercept or trend or both that guide the decision are embedded in the ARDL model. One set assumes that all the regressors in the ARDL model are of 1(0), and another presupposes that all the regressors are 1(1). In this, if the calculated F-statistic lies above the upper-bound critical value, it is confirmed that there is existence of non-spurious long run equilibrium relationship among the variables. If the F-statistic lies below the lower-bound critical value, there is no

In testing for the null hypothesis to ascertain the non-existence of long run (H_0) relationship against the alternate hypothesis (H_1) based on (6) above, the general form of the bound testing system is expressed below:

$H_0: \pi_{ex} = \pi_{im} = \pi_{gxp} = \pi_{elib} = \pi_{inf} = \pi_{exr} = 0$, a priori, this relationship implies that the null hypothesis of no cointegrating equations is sustained in the long run. Contrarily, the relationship $H_1: \pi_{ex} \neq \pi_{im} \neq \pi_{gxp} \neq \pi_{elib} \neq \pi_{inf} \neq \pi_{exr} \neq 0$, a priori, is an indication of an expectation of existence of a long run relationship among variables which supports the claim of the alternate hypothesis.

If it is ascertained that a long run cointegrating relationship exists, the conditional ARDL ($p, q_1, q_2, q_3, q_4, q_5$) for export performance growth in Nigeria is specified as:

$$ex_t = \alpha_0 + \sum_{t=1}^p \alpha_t ex_{t-1} + \sum_{j=1}^{q_1} \alpha_j im_{t-j} + \sum_{k=1}^{q_2} \alpha_k gxp_{t-k} + \sum_{l=1}^{q_3} \alpha_l elib_{t-l} + \sum_{m=1}^{q_4} \alpha_m inf_{t-m} + \sum_{n=1}^{q_5} \alpha_n exr_{t-n} + \varepsilon_i \quad (8)$$

Additionally, to estimate the short run dynamics, we specify error correction mechanism related with the long run estimates and expressed as:

$$\Delta x_t = \rho_0 + \sum_{i=1}^p \rho_i \Delta x_{t-i} + \sum_{j=1}^{q1} \rho_j \Delta im_{t-j} + \sum_{k=1}^{q2} \rho_k \Delta gxp_{t-k} + \sum_{\ell=1}^{q3} \rho_{\ell} \Delta elib_{t-\ell} + \sum_{m=1}^{q4} \rho_m \Delta inf_{t-m} + \sum_{n=1}^{q5} \rho_n \Delta exr_{t-n} + \xi ecm + \varepsilon_i \tag{9}$$

where ξ denotes the speed of adjustment process and error correction mechanism (ecm) is the residuals generated and transformed from OLS regression (one). Other variables remain as earlier defined. The coefficient of error correction term, a priori should be negative and significant if the calculated t-value is 2 or above 2 to give credence to the existence of long run relationship.

4.0 EMPIRICAL RESULTS AND DISCUSSION OF FINDINGS

As a prologue to the estimation of time series models, such as bound test and autoregressive distributed lag modeling, the stationarity properties of the variables was scrutinized using the Augmented Dickey Fuller procedure to confirm the existence or otherwise of unit root to circumvent nonsensical results. The results of the ADF test are presented in table 1 below.

Table 1. Results of the unit root test at 5 percent level of significance

VARIABLES	Levels		First Difference		Second Difference		Order of integration	Lag length
	ADF Statistic	critical values	ADF statistic	critical values	ADF statistic	critical values		
EX	-0.755362	-1.951332	-3.183236	-1.1951332			1(1)	1
IM	2.651006	1.951000	-4.315683	-1.1951332			1(1)	1
GXP	3.172623	1.951000	-1.5825570	-1.951687	-8.032281	-1.952066	1(2)	1
ELIB	1.09569	1.951000	-4.0619750	-1.1951331			1(1)	1
INF	-2.193599	1.951000					1(0)	1
EXR	-1.895797	1.951000	-4.4911080	-1.1951332			1(1)	1

Source: Authors' computation

From the results above, except for INF, all other variables were stationary after first difference, while GXP became stationary after second difference. Therefore, the null hypothesis of non-existence of unit root can not be rejected at 5 percent level of significance. Bound testing system for co-integration results between exports and its determinants are presented in table 2.

Table 2. Bound test for co-integration analysis

Test statistic	Value	K
F-statistic	21.6181	5
Critical Value bounds		
Significance	10 Bound	11 Bound
10%	2.26	3.35
5%	2.62	3.79
2.50%	2.96	4.18
1%	3.41	4.68

Source: Authors' computation

The results of the ARDL bound test show a calculated F-statistic of 21.6181. This infers that F- statistic is greater than the upper critical bound value of 3.79 and lower critical bound value of 2.62 at 5% level. These results confirm the validity of the bound test and hence led to the rejection of the null hypothesis of non-existence of long run equilibrium relationship. Furthermore, it could be concluded that a long run equilibrium relationship exist between exports and import, government expenditure, openness of the economy, inflation and exchange rates

Having confirmed the existence of the long run equilibrium relationship between export and the selected determinants, we proceeded to estimate the long run parameters of the ARDL and the estimated results are presented in table 3. From the results, it can be established that all

Table 3: Estimated Long Run Coefficients of the ARDL Model

ARDL (1, 1, 0, 0, 0, 0). Dependent Variable: $\ln EX$ based on Akaike Information Criterion (AIC)

Regressor	Coefficient	Std. Error	t-Statistic	Prob.
$\ln IM$	0.333667	0.387643	0.860758	0.3972
$\ln GXP$	0.922168	0.520860	1.770471	0.884
$\ln ELIB$	-0.129148	0.212597	-0.607479	0.5488
INF	0.004390	0.007005	0.626673	0.5363

EXR	0.020438	0.026420	0.773559	0.4462
C	-0.650727	0.550734	-1.181561	0.2481

Source: Authors' computation.

The explanatory variables are statistically insignificant to support growth in exports in the long run at 5% level. The low and insignificant t-values of the independent variables corroborate this floppiness in the coefficients. From the results, it is indicated that a 1% increase in imports ($\ln IM$) yielded approximately an infinitesimal 0.33% change in export performance and the t-value is equal to 0.860758. This is statistically insignificant and can be attributed to the persistent dependence on imported goods for industrial and household consumption. In spite of government's orchestrated policy stance on import substitution, the commitment of the government in the implementation of the policy appears weak and nonchalant.

Government expenditure ($\ln GXP$) enters the model with a positive coefficient of 0.922168 and a t-statistic of 1.77. These results obviously elucidate the Nigerian state of affairs where a greater chunk of the federal government budgets are allocated annually to recurrent expenditure leaving a trifling fragment for investment in gross fixed capital formation, hence gloomy domestic investment and dismal productivity that cannot elicit substantial exports in the long run.

Contrary to the conjecture that openness of the economy potentially induces export performance, the coefficient of logged liberalized economy ($\ln ELIB$) is -0.129148 and a negatively insignificant t-value of -0.607479. This implies that as reforms aimed at liberalizing the economy were implemented by 1% exports plummeted by about -0.129148%. The liberalization, without adequate institutional framework to exercise certain level of control, potentially opened up the economy for indiscreet inflow of goods thereby crowding out the domestic manufacturing firms and in so doing inhibit output for domestic market and export. Furthermore, the coefficients of INF and EXR are statistically low and are not significant in the long run.

Nevertheless, the results of the error correction mechanism (ECM) which fastens the long run behaviour to the short run dynamics of the ARDL model is presented in table 4. It is interesting to observe some incredible improvement in the performance of some variables in the ECM. For example, the coefficient of $\Delta \ln EX(-1)$ and $\Delta \ln EX(-2)$, i.e. export lagged one and two periods generate conflicting signs in their coefficients and the t-values. While $\Delta \ln EX(-1)$ yielded

Table 4 : Estimated Short Run Coefficients of the ARDL Model

ARDL (2, 2, 0, 0, 2, 0, 0). Dependent Variable: $\Delta \ln EX$ based on Akaike Information Criterion

Variables	Coefficient	Std. Error	t-Statistic	Prob.*
$\Delta \ln EX(-1)$	0.487883	0.159957	3.050095	0.0066
$\Delta \ln EX(-2)$	-0.821319	0.142254	-5.773622	0.0000
$\Delta \ln IM$	0.606361	0.125905	4.816041	0.0001
$\Delta \ln IM(-1)$	-0.377281	0.161707	-2.333118	0.0308
$\Delta \ln IM(-2)$	0.539606	0.152194	3.545518	0.0022
$\Delta \ln GXP$	0.570842	0.178649	3.195319	0.0048
$\Delta \ln ELIB$	0.464132	0.237201	0.267346	0.7921
ΔINF	0.001463	0.002109	0.693396	0.4965
$\Delta INF(-1)$	0.000368	0.002006	0.183690	0.8562
$\Delta INF(-2)$	0.008806	0.002576	3.417951	0.0029
ΔEXR	0.049734	0.010627	4.679837	0.0002
ECM(-1)	-0.000118	5.31E-05	-2.217906	0.0389
C	0.004156	0.069188	0.060072	0.9527

$R^2 = 0.90$	<u>Model criteria</u> Adjusted $R^2 = 0.837$	F-Statistic = 14.36168
Prob(F-statistic) = 0.00000	D-W stat = 1.54	AIC = -0.421050
SSR = 0.545697	MDV = 0.221023	S. D. D. V. = 0.421038

Source: Authors' computation.

A coefficient of 0.487883 and a t-statistic of 3.050095 respectively, the $\Delta \ln EX(-2)$ is reported to have generated a coefficient and t-value of -0.821319 and -5.773622 respectively. In this, past values of export lagged once with a coefficient of 0.487883 and t-value of approximately 3.05 was statistically significant in the export equation. Nonetheless, this value added was not sustained into the subsequent period with two lags; hence negative coefficient and t-statistic of -0.821319 and -5.772622 respectively were reported. These contradictory results in the short run horizon could be accounted for by government policy changeability. It could further be deduced that because of government policy volatility, previous period gains in exports performance lagged one ($\Delta \ln EX(-1)$) was not sustained into the subsequent period denoted as ($\Delta \ln EX(-2)$).

The coefficient of import in the contemporaneous period ($\Delta \ln IM$) is 0.606361 and statistically significant with a t-statistic of about 4.816. This result suggests that a 1% increase in the value of import in the current year stimulated export by approximate 0.606%. The results of previous year's value of imports with one and two lags ($\Delta \ln IM (-1)$ and $\Delta \ln IM(-2)$) respectively are quite fascinating as the signs of the estimated coefficients and t-values are paradoxically incongruous. From the results, contrary to apriori expectation, the performance of import in the contemporary year and one lag signify positive coefficients and are statistically and positively significant. This relationship defied theoretical postulation and can be accounted for by complexities in bilateral trade relations among nations. Against this background, import lag one, that is $\Delta \ln IM (-1)$, behaves according to theoretical supposition. Thus, a 1% increase in the value of previous year's value of import with one lag in Nigeria resulted in approximately a 0.33% decline in export performance. The variable is negatively significant in the model estimating export performance within the period under consideration.

The estimated coefficients of inflation both in the contemporary year and one period lag yield quite alluring results. From table 4, ΔINF and $\Delta INF(-1)$ are not significant in supporting export growth in Nigeria within the period under review. The country's manufacturing capability has greatly diminished due to persistently high inflationary pressure which repressed output growth for domestic consumption and exports. It can be deduced that the substantial increase in the value of export was attributable to improved receipts from crude oil exports. Interestingly, receipts from oil exports to a greater degree further pushed up inflationary rates to the

advantage of crude oil exports and to the detriment of non-oil exports.

The coefficient of contemporaneous government expenditure in the short run is captivating. The coefficient is positive and also significant in driving export. The result also shows that a 1% increase in government expenditure leads to 0.57% value added in export promotion. This study evidently shows that liberalized economy has not significantly supported export growth. The long run behaviour of the openness of the economy, proxied by the degree of liberalization (ELIB), with the estimated coefficient of 0.0063415 in the short run ECM model is statistically low and insignificant since the computed t-statistic is 0.267346 at 95% level of confidence. Liberalization may not have significantly engendered output growth even in the short run to mobilize export growth. In practical terms, it could be opined that policy on economic openness could not adequately drive export performance. Against apriori expectation, exchange rate variation in Nigeria spawn positive short run effect on export. In real terms, exchange rate devaluation/depreciation can only support export in a productive economy. In Nigeria the reverse is the case. The substantial rise in export earnings due to exchange rate volatility in the contemporaneous year is attributable to irregular enhanced receipts from crude oil exports. The equilibrium correction coefficient or error correction mechanism (ECM) has the correct sign, though the coefficient is statistically low. Nevertheless, the model reports a calculated t-statistic of -2.217906 and a p-value of $0.03 < 0.005$ for the ECM which infers that the ECM is significant. The low ECM implies that a low speed of adjustment from the previous period disequilibrium in exports growth to contemporary period equilibrium can be attained slowly. Thus, government's export policy drive should be pursued slowly.

The diagnostic test for the short run dynamics is high with the coefficient of determination, which is adjusted R-square of approximately 84%. This concludes that the fitness of the model is good and that 84% of variation in export performance is explained by the model while approximately 16% of changes in exports are captured by the stochastic white noise. It also symbolizes that the 16% of those changes occur by chance. The model is not suffering from the problems associated with auto-correlation. The Durbin-Watson statistic is 1.54 and indicates that there is no presence of either positive or negative serial correlation. The model reports an F-statistic and a Prob(F-statistic) of 14.36168 and 0.000000 respectively. This signifies that model is significant in explaining the problem under investigation.

Furthermore, it could be concluded that the variables of study have cooperatively euded changes in exports in Nigeria during the period under consideration.

Furthermore, the cumulative sum of squares (CUSUMSQ) of the recursive residual test was employed to examine the structural stability of the long run behaviour and the short run dynamics of the

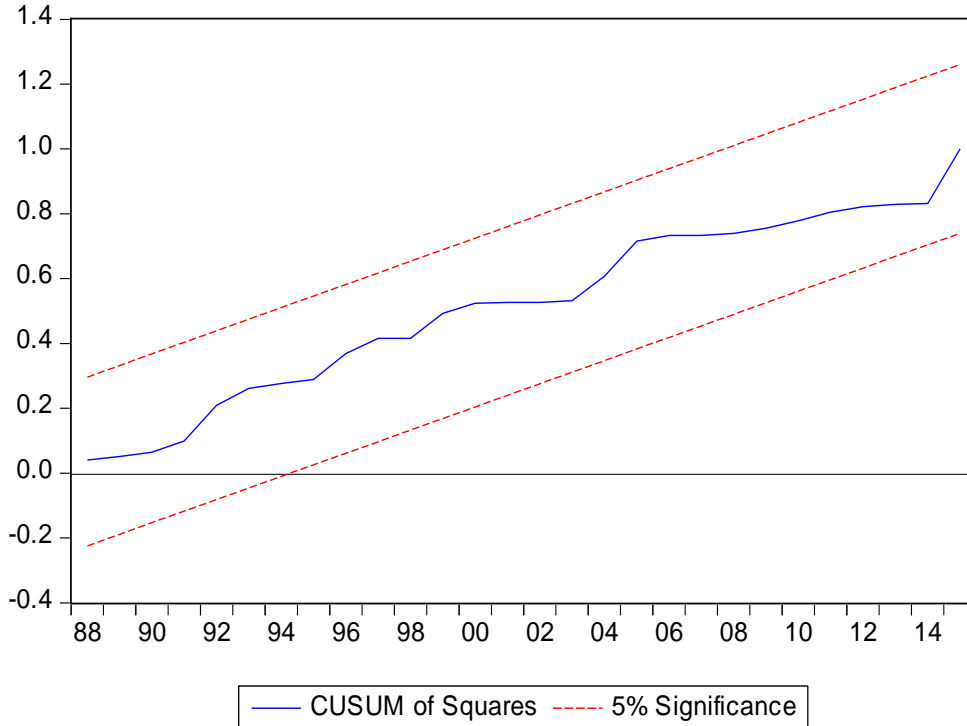


Figure 1. CUSUMSQ for stability test

5.0 CONCLUSION AND POLICY IMPLICATIONS

In this study the researchers sought to establish the nexus between the selected macroeconomic variables (import, government expenditure, trade openness, inflation rates, and exchange rates) that potentially can determine export performance in Nigeria from 1981 to 2015. From this study, it is established that none of the selected variables positively influenced the performance of export in Nigeria in the long run. In spite of the above scenario, the results of the short run dynamics are ambiguous as volatility is detected in the performance of the explanatory variables in the short run ARDL model. Thus, it is obvious that government policy summersault and volatile economic environment are paradoxically contradictory and hence could be responsible for abysmal export performance. Therefore, to address the above identified shortcomings to achieve high export performance for growth and development in Nigeria, the following implications are considered plausible:

models for the period under investigation. It is fundamentally imperative that the sum of squares settle within 5% critical bound, which is between the two straight lines found in figure 1. Evidently, the sum of square plot lies within 5% critical lines, confirming that the variables of study were reasonably stable. Thus, it is established that a stable relationship existed among the variables within the period of investigation.

- It is necessary that policy makers review current economic policy and embark on the formulation of long term stabilization plans to improve the domestic macroeconomic dynamics aimed at promoting exports.
- Policy on trade openness needs to be reviewed and its implementation pursued with caution and followed sequentially for proper monitoring of its consequences to ensure consistency with overall long term macroeconomic objectives.
- Efforts aimed at promoting domestic industrialization growth should be emphasized. This is to encourage increased output for domestic consumption and exports for foreign exchange.
- The monetary authority should adopt a more pragmatic and purposeful approach in the exchange rate management to enhance export growth. Hence, it is essential that domestic industrialization growth needs to be accentuated.

References

- Abbas, S. (2012). Causality Between Exports and Economic Growth: Investigating Suitable Trade Policy for Pakistan. *Eurasian Journal of Business and Economics*; 5 (10), PP.91-98.
- About-Stait,F. (2005). Are Export the Engine of Economic Growth? An Application of Cointegration and Causality Analysis for Egypt, 1977-2003. *Economic Research Working Paper No.76*
- Akinlo, A. E. (2006). Macroeconomic Factors and Total Factor Productivity in Sub-Saharan African Countries. *International Research Journal of Finance and Economics*. Issue 1.
- Akintunde, J. (2017). Policy Options for Ending the Recession. Retrieved from <http://www.financialnigeria.com/policy...> (Accessed 10th November, 2017).
- Anthony, I. I., Peter, U., and Richard, S. (2012). The Impact of Macroeconomic Variables on Non-Oil Exports Performance in Nigeria, 1986 – 2010. *Journal of Economics and Sustainable Development* Vol 3. No.5.
- Anyanwu, J. C. & Oaikhenam, H. E. (1995). Modern Macroeconomics: Theory and Application in Nigeria, Onitsha: Joanee Educational Publishers Ltd.
- Bruce, J. (2012), What Should Government do to Boast Export? www.freshbusinessstinking.com (Assessed 1st November, 2017).
- Brue, S. L. and McConnel C. R., (2005). Economics: Principles, Problems and Policies, Boston: McGraw – Hill Irwin.
- Chen, S. (2007). “Exactly what is the link between Export and Growth in Taiwan? New Evidence from Granger Causality”. *Economic Bulletin* 6(7), pp.1-10.
- Economic Outlook for the Nigerian economy – National Bureau of Statistic 2013 – 2016. www.nigerianstat.gov.ng/pdfuploads/Economic_outlook_2013_2016.pdf
- Enu, P and Attah-Obeng, P. (2013). Which Macroeconomic Factors Influence Agricultural Production in Ghana? *Academic research International*, Vol.4, No.5, pp.33-46.
- Essien, E. A. (2002). Nigeria’s Economic Growth: Performance and Determinant, *CBN Economic and Financial Review*, 40(3).
- Gemechu, D. (2002). Exports and Economic Growth in Ethiopia: An Empirical Investigation. *Unpublished Master’s Thesis*, Addis Ababa University.
- Hellyer, M. (2012). The Role of Government in Development of Service Trade. Unctad.xiii.org/en/presentation/uxiii2012G_SF_SI_Hellyer.pdf
- Idowu, K. O. (2005). “A Preliminary Investigation into the Causal Relationship between Exports and Economic Growth in Nigeria. *CBN Economic and Financial Review*. 43(3) 29-50.
- Jarra, S. T. (2013). Exports, domestic demand and economic growth in Ethiopia: Granger causality analysis. *Journal of Economics and International Finance*; 5(9), PP.357-372.
- Jones, C. I. (2008). Macroeconomics, London: W. W. Norton and Company.
- Lederman, D. and Maloney, C. (2003). Trade Structure and Growth, World Paper. Vol. 3025 (April) Washington DC.
- Lin, J. and Li, Y. (2007). Exports and Economic Growth in China: A Demand-Oriented Analysis: Mimeo. *Centre for Economic Research*. Pekin University, Beijing, China.
- Medina-Smith, E. J. (2001). Is the Export Led Growth Hypothesis Valid for the Developing Countries? A Case Study for Costa Rica. Study Series Number 7, *United Nations Conference on Trade and Development*.
- Michaly, I. (2007). A Portfolio Approach to Monetary Supply Determination in Nigeria. *Journal of Economics and Social Studies*. Vol.16 No17.
- Nto, P. and Mbanasor, J. A. (2011). Productivity in Agribusiness Firms and It’s Determinants in Abia State. *Nigeria Journal of Economics and International Finance*, Vol.3, No.12, pp.662-668.
- Onoh, J. K. (2013). Dimensions of Nigeria’s Monetary and Fiscal Policies: Domestic and External. Port Harcourt: Sonite Publishers.
- Pesaran, M. H; and Shin, Y. (1999). An Autoregressive Distributive –Lag Modeling Approach to Cointegration Analysis in Econometric and Economic Theory in the 20th Century: The Ragnar Frisch Continental Symposium, Steinar Strom (ed). Cambridge University Press, New York, 1998, pp. 371-413. doi=10.1.1.153.3246&rep=rep1
- Pesaran H. M; Shin, Y and Smith, R. J. (2001). Bound Testing Approach to the Analysis of Level Relationship, *Journal of Applied Econometrics* Vol. 16, 289-326. Onlinelibrary.wiley.com/doi/10.1002/jae.616/pdf.
- Ray, S. (2012). Determinants of Total Factor productivity Growth in Selected Manufacturing Industries in India. *Research and Social Sciences*, Vol.7, No. 2, pp.25-43.
- Shirazi, N. S. and Abudul Manap, T. L. (2005). Export -Led Growth Hypothesis: Further Evidence from South Asia. *The Developing Economics*, PP. 472-488.
- Subho, M. (2017). Foreign Trade Policy: Import-Substitution vs Export Orientation. www.economicdiscussion.net (Assessed 20th October, 2017).
- World Bank (2009) “What Role Should Government Play in Broadband Development?” *Paper*

Prepared for Info. Dev/OECD Workshop on "Policy Coherence in ICT for Development", Paris.

World Bank Report, 2009.

www.google.com.ng/search?q=government=policies=to+encourage=export=btnG= (Assessed 1st November, 2017).

Pesaran, M. H; and Shin, Y. (1999). An Autoregressive Distributive –Lag Modeling Approach to Cointegration Analysis in

Econometric and Economic Theory in the 20th Century: The Ragnar Frisch Continental Symposium, Steinar Strom (ed). Cambridge University Press, New York, 1998, pp. 371-413.doi=10.1.1.153.3246&rep=rep1

Pesaran H. M; Shin, Y and Smith, R. J. (2001). Bound Testing Approach to the Analysis of Level Relationship, *Journal of Applied Econometrics* Vol. 16, 289-326. Onlinelibrary.wiley.com/doi/10.1002/jae.616/pdf.