Cross Current International Journal of Economics, Management and Media Studies
Abbreviated Key Title: Cross Current Int J Econ Manag Media Stud
ISSN: 2663-2462 (Print) & Open Access
DOI: 10.36344/ccijemms.2020.v02i10.001

Volume-2 | Issue-10|December, 2020 |

Research Article

Economic Growth –Trade Liberalization Nexus: The Case of Nigeria

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| **Received:** 13.11.2020 | **Accepted:** 24.11.2020 | **Published:** 10.12.2020 |

Abstract: This study uses the case of Nigerian economy to offer a robust insight on the extent to which trade liberalization matters for economic grow. Exploring ARDL modelling framework, we consider three alternative measures of trade liberation to determine whether the response of economic growth to trade liberalization is sensitive to the choice of the indicators of trade liberalization that is under consideration. We find significant effects of trade liberalization on economic but mainly in terms of trade openness and only in the short run situation. Thus, we recommend that policymakers consider alternative trade liberation strategies such as deeper integration framework capable of promoting the development of regional human capital and consequently long term economic growth.
Keywords: Nigeria; Trade liberalization; Tariffs; ARDL.

INTRODUCTION

As it were with a number of developing economies in the 1980s, trade liberalization in Nigeria can be traced formally to the policy conditionality central to the then World Bank Structural Adjustment Programs (SAPs), with trade reforms accounting for a higher proportion of loan conditions than any other area of policy. In the word of Greenaway *et al*. [1], the fundamental rationale for such degree of commitment to programmes of trade reform is motivated by the obvious belief that trade liberalization is a prerequisite to the actualization of the quest for transition from a relatively closed to a relatively open economy. The world over, the basic underlying intuition behind trade liberalization is essentially to promote free flow of cross boarder trading activities by eliminating all restrictions and barriers to trade.

Partially due to the assertion that trade liberalization by extension has the potential for enhancing economic performance, the Nigerian economy has since embraced and undergone a number of trade liberalization policies including decrease in both duties and non-tariff barriers. This in particular may equally not be unconnected to the widespread assertion attributing the impressive economic growth and industrialization process in some of the now referred developed countries to proactive trade policies, rather than reliance on unfettered market forces [2]. This though, portends trade liberalization as potential for enhancing economic growth, but the vast of the extant studies on the subject matter appears to be largely mixed and inconclusive in their findings of the nature and direction of relationship between economic growth and trade liberalization [3-8].

Reaffirming the erratic nature of the existing findings on the impact of trade liberalization on economic growth even from the theoretical perspective is the view by Rodriguez and Rodrik [8] that, trade liberalization under the assumption of endogenous growth model –may increase global output, but not necessarily the output of all countries. There is also, the classical growth models prediction under the assumption of constant returns to scale, that the removal of trade restrictions should not have a permanent effect on long –run economic growth [9, 10].

In attempt to validate or refute the above theoretical position, quite a reasonable number of the extant studies tends to attribute the lack of consistency in the existing empirical results to the use of different trade liberation indicators [11, 12]. Thus, in addition to exploring short and long run dynamics of the potential impacts of trade liberalization on economic growth using autoregressive distributed lag (ARDL) modelling framework, we also contribute to the literature by considering alternative measures of trade liberation, particularly in the context of the investigated economy (i.e. Nigeria). Essentially, we consider three indicators of trade liberation namely, Trade Ratio/Trade Openess [13-15], Tariffs [16-18] and Real Effective Exchange Rates [19, 20, 18, 21].

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However, unlike a number of the previous studies, where only one of these alternative measures of trade liberalization is considered, this present study following Manwa *et al*. [6] approach is considering all of these indicators comparatively. To achieve this, the remainder of this paper is structured as follows: Section 2 presents a brief empirical review of the previous findings on economic growth and trade liberalization relationship. Section 3 presents the theoretical framework. Section 3 offers some preliminary results to determine the suitability of the chosen econometric technique in Section 4. The presentation of empirical result and discussion of findings are explained in Section 5 while Section 6 concludes the paper.

LITERATURE REVIEW

Brief review of empirical literature

So far there has been proliferation of empirical literature investigating the impacts of trade liberalization on economic growth both from the perspectives of country –specific and cross –sectional analysis. Findings from these studies namely, Edwards [22]; Frankel and Romer [23]; Wei [24]; Rodríguez & Rodrik [8]; Wacziarg [25]; Winters [26]; Kneller *et al*. [9]; Read & Parton [27]; Bhattacharyya [7]; Manwa [3]; Rodrik [2]; Titus & Abiodun [5]; Gnangnon [5]; Manwa *et al*. [4]; among others, have been largely mixed attributable to an array of reasons including differences in the construction of indexes, data measurement, timeframes, and choice of estimation techniques.

Deciphered from summary of the review of the existing literature represented in Table 1 is the fact that the heterogeneity of the empirical outcomes of the extant with respect to the significance or otherwise of the impact of trade liberalization on economic growth may be due to factors such as variables omission from the regression analysis. Supporting this position is the study by Tahir and Ali [28], which provides a comprehensive review of literature on trade liberalization and economic growth. The study identifies methodological differences as the main source of disagreement in literature. To this end, this present study commences it's empirically analysis via an endogenous growth model that is exclusive of the trade liberalization indicator(s) and tagged it the baseline model. The essence is to replicate on our sample the seminal estimations of the literature on growth and then subsequently introduced into the growth regression the various measures of trade liberalization tagged the extended model.

THEORETICAL FRAMEWORK

Although, the main objective of this study is to empirically investigate the impact of trade liberalization on economic growth using the case of Nigerian economy, but such as task first require that we establish a theoretical foundation upon which the link between economic growth and trade policy can be explored. Essentially, we adopt the endogenous growth model as our baseline theoretical framework, where labour, physical capital, human capital and total factor productivity are considered as the primary determinants of economic growth (see for example, Manwa *et al*., [6]; Manwa & Wijeweera, [3]. Thus, the endogenous growth hypothesis of long run economic growth as emanating from forces internal to a system can be specified as below.

$$Y = AL^{\beta_1} K^{\beta_2} HC^{\beta_3} e^{\varepsilon_t} \quad (1)$$

Where *Y* is output, *A* is technology representing total factor productivity, *L* is labour, *K* is physical capital and *HC* is human capital.

Turning to the focal point of this study, which is to understand the extent to which trade liberalization matters for economic growth, the theoretical model in equation (1) is therefore, further extended to include trade liberalization indicator as follows:

$$Y = AL^{\beta_1} K^{\beta_2} HC^{\beta_3} LIB^{\beta_4} e^{\varepsilon_t} \quad (2)$$

Thus, while all the terms in equation (2) remain as earlier defined, the term LIB denotes vector of trade liberalization indicators. Both equations 1& 2 can be rewritten via natural logarithm so that the models are linear in parameters as given in equation (3) using the case of the latter as example.

$$Log(Y_t) = \beta_0 + \beta_1 LogL_t + \beta_2 LogK_t + \beta_3 LogHC_t + \beta_4 LogLIB_t + \varepsilon_t \quad (3)$$

The term *a* denoting technology in equations 1&2 is though considered as an important factor for economic growth, the fact that it is not explicitly reflected in equation (3) is due to the fact that the impact of technology is primary transmitted via human and physical capitals.

As earlier established, one of the main innovations of this study is test whether the choice of

the indicator of trade liberalization matters for the extent to which trade liberalization matters for economic growth. To this end, this present study uses three different indicators of trade liberalization namely; trade ratio/trade openness (TOP), tariff rates (TR) and real effective exchange rates (REER).

The TR on the other hand is said to belong to the incidence –based category of liberalization and it is expected to have negative effects on economic growth [6]. The third indicator for instance REER fall under the price –based category of liberalization with a negative coefficient on the REER implying currency depreciation and otherwise when the sign on the coefficient is positive (i.e. currency appreciation). Theoretically, it is expected that the sign on the REER coefficient would be negative such that, currency depreciation would encourage domestic production due to higher cost on imports and increased demand for domestic products from the rest of the world.

DATA AND PRELIMINARY ANALYSIS

This study uses 38 annual observations covering the period between 1891 and 2018. The data were obtained from three different sources including Central Bank of Nigeria (CBN) statistical bulletin, World Bank Development Indicator (WDI) and Penn World Tables (PWT). The economic growth (*Y*) measured as log of real GDP was in particular obtained from the CBN statistical bulletin, while labour (*L*) proxied by number of persons employed/engaged was obtained from the PWT database. Saying it differently, the labour force data also expressed in log term was constructed using estimates of people that have contributed to production activities of the concern economy over the specified period [29].

In line with the specified endogenous growth theory, the labour force is expected to have a positive influence on growth. The variable *K* denoting physical capital measured as log of gross fixed capital information in constant 2010 US dollar and it was obtained from WDI, while *HC* representing human capital is measured as log human capital index obtained from PWT. With respect trade liberalization indicators, the TOP regarded as outcome –based liberalization is measured as the sum of total export and import of goods and services to the country's GDP [25] and is expected to have positive impact on economic growth. For TR which is described as incidence –based category of liberalization, it is measured as log of average nominal tariff rates on all products and it is expected to have negative effects on economic growth [6].

The third trade liberation indicator for instance which falls under the price –based category of liberalization was measured as log of REER such that, a negative coefficient on the REER implies currency depreciation while otherwise when the sign on the coefficient is positive (i.e. currency appreciation). Theoretically, it is expected that the sign on the REER coefficient would be negative such that, currency depreciation would encourage domestic production due to higher cost on imports and increased demand for domestic products from the rest of the world.

Presented in Table 2 is the summary statistics of the series, where the average economic growth measured as real GDP is N33.7 billion for the period under consideration. Compared to the average trade openness which is only 32.2% percent of the sum of export and import as ratio of GDP, the average trade restriction policy for instance Tariffs rate is as high as 22.1% which is typical of developing economies such as Nigeria. For the standard deviation statistic which measures the degree of the dispersion of the series from their mean level, the value seems to be exact for both trade openness policy at 12.59 and trade restrictiveness policy at 12.95. What this seems to be suggesting is that variations in trade policies have been due to equal concerns both from the perspectives of trade openness and trade restriction.

With respect to the distribution statistics, all the series are positively skewed but the result is mixed for kurtosis statistic. For instance, the kurtosis statistic is platykurtic for TRF, REER and K, while it is leptokurtic for Y, L, HK and TOP. Partially due to the fact that the skewness statistics for L, HK and TOP seems not different from zero tend to be supporting the largeness of the p-value associated with the Jarque-Bera (JB) test for these series, which seems to be suggesting that they are normally distributed. However, the null hypothesis of normal distribution seems to be rejected for Y, K, TRF and REER.

Table-2: Summary Statistics

Statistic	Y	L	K	HK	TOP	TRF	REER
Mean	33,725.22	40.88	56.54	1.49	32.26	22.14	150.45
Maximum	69,810.02	62.91	105.06	1.94	53.28	87.19	541.46
Minimum	13,779.26	27.03	37.72	1.20	9.14	9.94	50.17
Std. Dev.	19,578.10	11.16	13.17	0.26	12.56	12.95	121.23
Skewness	0.73	0.45	1.49	0.33	0.35	3.27	1.83
Kurtosis	2.00	1.94	6.33	1.65	2.19	17.87	5.49
Jarque-Bera (JB test)	5.01 (0.08)	3.10 (0.21)	31.74 (0.00)	3.59 (0.17)	1.83 (0.40)	418.17 (0.00)	31.06 (0.00)

Note: the value in parenthesis is probability value associated with the JB test

As a precondition for dealing with time series, we further subject each of the series to unit root tests. For robustness purpose, we consider both the Augmented Dickey-Fuller (ADF) test and the modified version namely, Dickey-Fuller GLS (DF-GLS) test. Presented in Table 3 is the unit root test result which is performed on the natural logarithm of the series. Strengthening our choice of estimation technique for instance ARDL framework is the mixed integration properties exhibited by the variables. For instance, a look at table 3 below shows that the integration properties for each of the series hover between I (0) and I(1) nonetheless the choice of unit root test.

Table-3: Unit Root Test Results

	ADF test			***DF-GLS test***		
	Level	First Difference	I(d)	Level	First Difference	I(d)
Y_t	-2.4247[b]	-3.3950[b]**	I(1)	-1.8100[b]	-3.3282[b]**	I(1)
L_t	-4.4880[b]***		I(0)	-2.0170[b]	-4.2981[b]***	I(1)
K_t	-4.7423[b]***		I(0)			I(0)
HC_t	-3.3745[b]**		I(0)	-2.5140[b]**		I(0)
TOP_t	-2.2768[a]	-7.3470[a]***	I(1)	-1.9937[a]**		I(0)
TRF_t	-3.4412[b]	-8.8934[b]***	I(1)	-2.1024[a]**		I(0)
$REER_t$	-2.8314[a]	-4.5964[b]***	I(1)	-2.6730[b]	-4.7099[b]***	I(1)

Note: The exogenous lags are selected based on Schwarz info criteria, while ****, **, * imply that the series is stationary at 1%, 5% and 10% respectively. The superscript a&b denotes model with constant and model with constant and trend, respectively.

Econometric Model and Estimation Procedure

To capture the potential long run dynamic of the investigated economic growth –trade liberalization relationship, we favour the bounds cointegration testing approach developed by Pesaran *et al.* [25]. The preference for this technique is mainly informed by its flexibility to simultaneously accommodate the variables under consideration in their mixed order of integration as suggested by the outcomes of our pre unit root testing results. More importantly, the bounds cointegration testing approach often provides robust long run estimates even in the presence of some endogenous variables in the model [18]. Beyond the cointegration testing, the bonds test utilizes the autoregressive distributed lag (ARDL) model, to provide estimates of both the short and long coefficients in a single step. Essentially, specified in equation (4) below is ARDL version of growth –trade liberation model in equation (3).

$$\Delta \ln Y_t = c + \alpha_1 Y_{t-1} + \alpha_2 L_{t\_1} + \alpha_3 K_{t\_1} + \alpha_4 HC_{t\_1} + \alpha_5 LIB_{t-1} + \sum_{j=1}^{p} \beta_{1j} \Delta Y_{t-j} + \sum_{i=0}^{q_2} \beta_{2i} \Delta \ln L_{t-i} +$$

$$\sum_{i=0}^{q_3} \beta_{3i} \Delta \ln K_{t-i} + \sum_{i=0}^{q_4} \beta_{4i} \Delta \ln HC_{t-i} + \sum_{i=0}^{q_5} \beta_{5i} \Delta LIB_{t-i} + \mu_t \qquad (4)$$

while all the variables remain as earlier defined, it must be pointed out that the term LIB representing trade liberalization is singly captured across the three variants of trade liberalization indicators under consideration namely; TOP, TR and REER. The long run parameters for the intercept and slope coefficients are computed as: $-\frac{c}{\alpha_1}$, $-\frac{\alpha_2}{\alpha_1}$, $-\frac{\alpha_3}{\alpha_1}$, $-\frac{\alpha_4}{\alpha_1}$, and $-\frac{\alpha_5}{\alpha_1}$. However, since in the long run it is assumed that $\Delta Y_{t-i} = 0$ and $\Delta(L, K, HC, LIB)_{t-j} = 0$, respectively, the short run estimates are obtained as $\beta_{1j}, \beta_{2i}, \beta_{3i}, \beta_{4i}$ and β_{5i}.

Since the variables in first differences can accommodate more than one lag, determining the optimal lag combination for the ARDL becomes necessary. The optimal lag length can be selected using Schwartz Information Criterion (SIC). The lag combination with the least value of the chosen criterion among the competing lag orders is considered the optimal lag. Consequently, the preferred ARDL model is used to test for long run relationship in the model. This approach of testing for cointegration as earlier described is referred to as bounds testing as it involves the upper and lower bounds. The test follows an F distribution such that, if the calculated F-statistic is greater than the upper bound, there is cointegration; if it is less than the lower bound, there is no cointegration

and if it lies in between the two bounds, then, the test is considered inconclusive.

In the spirit of our model, the null hypothesis of no cointegration can be expressed as $H_0: \alpha_1 = \alpha_2 = \alpha_3 = \alpha_4 = \alpha_5 = 0$ while the alternative of cointegration is symbolized as $H_1: \alpha_1 \neq \alpha_2 \neq \alpha_3 \neq \alpha_4 \neq \alpha_5 \neq 0$. Equation (4) can be re-specified to include an error correction term as follows:

$$\Delta \ln Y_t = c + \xi \upsilon_{t-1} + \sum_{j=1}^{p} \beta_{1j} \Delta Y_{t-j} + \sum_{i=0}^{q_2} \beta_{2i} \Delta \ln L_{t-i} + \sum_{i=0}^{q_3} \beta_{3i} \Delta \ln K_{t-i} + \sum_{i=0}^{q_4} \beta_{4i} \Delta \ln HC_{t-i} + \sum_{i=0}^{q_5} \beta_{5i} \Delta LIB_{t-i} + \mu_t \quad (5)$$

Where υ_{t-1} is the linear error correction term while the parameter ζ is the speed of adjustment.

EMPIRICAL RESULTS AND DISCUSSION

Starting with the estimates obtained from the baseline model for instance ARDL(1), where we started off the empirical analysis with attempt to replicate on our sample the seminar estimations of economic growth model and we find both physical capital and human capita to have exhibits positive and significant impacts on economic growth (see Table 4). Although, the fact that the coefficient on the error correction term is negative and significant further confirm the bounds cointegration testing rejection of the null hypothesis of no long run relationship, we finds no evidence of significance impact on the long run coefficient on L, K and HC. Confirming the overall fit of the estimated baseline growth regression (ARDL (1)), is our post estimation results, where the null hypothesis of no autocorrelation and heteroscedasticity seems not to be rejected thus confirming viability and consistency of the estimated model. Consequently, we extend the growth regression model to include trade liberalization indicators namely, TOP in ARDL (2), TRF in ARDL(3) and REER in ARDL(4).

In what appears to be consistent with our apriori expectation, we find trade liberalization with the potential of causing increasing economic growth, particularly when measures as a ratio of the sum of import and export to GDP. However, the coefficient on REER is negative and statistically significant and appears to differ from previous studies that have shown that the undervaluation of the exchange rate can have a positive impact on economic growth of developing countries [19, 20, 18]. Equally an interesting finding is the negative but insignificant impact of TRF on economic growth, thus suggesting that a tariff reduction is not likely to exhibit any significant impact on economic growth in Nigeria. Manwa *et al*. [6] also find similar evidence in the case of SACU countries.

However, the fact that our findings of significant impact of trade liberalization on economic is only viable and evident in the short run situation is not entirely unique to the present study. Rather our finding seems to have found support in the classical growth models prediction under the assumption of constant returns to scale, that the removal of trade restrictions should not have a permanent effect on long –run economic growth [9, 10].

Table-4: Empirical Result

		ARDL (1)	***ARDL (2)***	***ARDL (3)***	***ARDL (4)***
Short run	Δy_{t-1}	-0.1325*(0.070)	-0.0565(0.075)	1.7655**(0.075)	-0.1319*(0.066)
	ΔL_t	0.049(0.225)	0.2932(0.241)	0.0360(0.246)	0.3239(0.245)
	ΔK_t	0.1040**(0.041)	0.0845**(0.040)	0.1090**(0.041)	0.0604(0.043)
	ΔHC_t	0.6347*(0.355)	0.7270**(0.339)	0.5260(0.378)	1.0124**(0.374)
	ΔTOP_t		0.0012**(0.000)		
	ΔTRF_t			-0.0198(0.023)	
	$\Delta REER_t$				-0.0268**(0.011)
	C	1.7453**(0.754)	1.7104**(0.715)	1.7655**(0.758)	2.5585***(0.797)
	ECT_t	-0.1325***(0.015)	-0.0565***(0.006)	-0.1531**(0.017)	-0.1319***(0.013)

Long run	L_t	0.3698(0.769)	5.1898(9.641)	0.2350(1.571)	2.4540(2.480)
	K_t	0.7849(0.543)	1.4970(2.104)	0.7116(0.451)	0.4578(0.417)
	HC_t	4.7907(3.028)	12.8663(16.822)	3.4344(2.715)	7.6707*(4.058)
	TOP_t		0.0229(0.036)		
	TRF_t			-0.1293(0.143)	
	$REER_t$				-0.2035(0.136)

Cointegration testing Result

Level of Significance	***ARDL (1)***			***ARDL (2)***			***ARDL (3)***			***ARDL (4)***		
	F-stat	***I(0)***	***I(1)***	***F-stat***	***I(0)***	***I(1)***	***F-stat***	***I(0)***	***I(1)***	***F-stat***	***I(0)***	***I(1)***
10%	12.84	2.37	3.20	12.69	2.20	3.09	10.74	2.20	3.09	12.90	2.20	3.09
5%		2.79	3.67		2.56	3.49		2.56	3.49		2.56	3.49
1%		3.65	4.66		3.29	4.37		3.29	4.37		3.29	4.37

Diagnostic Test/Post Estimation Result

Post Estimation Results		***ARDL (1)***	***ARDL (2)***	***ARDL (3)***	***ARDL (4)***
	$AdjR^2$	0.99	0.98	0.99	0.987
	$F-stat.$	2119.653***	1889.235***	1682.106***	1911.058***
	$Q-stat.$	3.0749 (0.215)	0.3877 (0.824)	2.7274(0.256)	2.6116(0.271)
	$Q^2-stat.$	0.8722 (0.647)	0.0433 (0.979)	0.8807(0.644)	0.3059(0.858)
	$ARCH-LM$	0.3739 (0.691)	0.0144 (0.985)	0.3802(0.686)	0.1105(0.895)

Note: Values parenthesis are standard errors for the estimated coefficients and p-values for the post estimation results, while *** p<0.01, ** p<0.05, * p<0.1 denotes 1%, 5% and 10% level of significance.

CONCLUSION

Using the case of Nigerian economy, this present attempt to offer a robust insight on the extent to which trade liberalization matters for economic grow. Exploring ARDL modelling framework, we consider three alternative measures of trade liberation to determine whether the response of economic growth to trade liberalization is sensitive to which indicators of trade liberalization are under consideration. Essentially, we find significant effects of trade liberalization in terms of trade openness on economic growth but mainly in the short run situation thus confirming the classical growth models prediction that the removal of trade restrictions may not have a permanent effect on long – run economic growth. For long run situation therefore, we recommends that policymakers should consider alternative frameworks such as deeper integration through strategies that promote the development of regional human capital towards achieving long run economic growth.

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