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TRADE AND GROWTH IN NIGERIA: AN EMPIRICAL INVESTIGATION (1970-2014)

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Abstract

The trade-growth nexus is well articulated in modern trade theories. This paper set out to test the trade-growth relationship in the Nigerian economy between 1970 and 2014. Three econometric models were specified for the study and estimated using Ordinary Least Square (OLS) regression technique. The data of the macroeconomic variables used in the models were obtained from Central Bank of Nigeria Annual Statistical Bulletin. The empirical results from the econometric analysis indicate that there was a shift / structural break in the Nigeria economy as a result of trade liberalization of 1986-1989. The results suggest that the growth impact of trade on the Nigerian economy derives mainly from the static gains of trade resulting from opening of the economy and weakly form dynamic long term gain. It was recommended among others, that there is need for active pursuit of trade policies that will stimulate total factor productivity of domestic industries, ensure gradual scaling down of barriers to trade and promote domestic and foreign investment in the service industry.

Keywords: Trade, Growth, Structural Break, Total Factor Productivity, Nigeria

INTRODUCTION

Right from the time of the classical economists, the theory of trade had been considered as vital in explaining development process in an economy. This was hinged on the observed long historical interdependence among the various economies of the world. In essence, no country is an island to itself or in a state of autarky. It is for this reason that international trade theorists have always tried to explain observed patterns in national development standards in terms of their differential natural endowments and production efficiency (Aboyade, 1983).

The observed interactions among production, distribution and exchange, and their implications for economic growth formed the central theme of trade theory. The assertion that trade has positive effects on economic growth could arguably be attributed to the work of Adam Smith (1776). Trade openness became the prevailing economic doctrine with an exception being its relative hibernation during the marginalist revolution (Backhouse, 1985). After the World War II, the emerging economic policy of free trade was truncated by the introverted and protectionist economic growth experiments especially in Latin America (Afonso, 2001).

Owing to the failure of the protectionist experiments and the observed association of quick economic growth with the opening of international trade and consequent specialization in several countries, as well as the results of many studies based on the neoclassical theories, a new decisive role was given to international trade as the driving force of economic growth (Afonso, ibid). It is important to note that although the dominant theoretical postulations (beginning with the classical economists) indicated a positive trade-economic growth nexus, the centre of concentration was the static effects of gains of trade.

For quite a long time, economists paid little attention to the difference between static and dynamic effects of trade in the literature. Baldwin (1984), after a survey of the empirical literature, posited that the static gains of trade were of little significance. Instead, the dynamic gains of trade mattered most for economic growth. This led to a series of debates in the last few decades on the subject with greater emphasis being placed on the importance of dynamic effects of trade. The theoretical isolation of these two effects (static and dynamic) of the theory of trade was made feasible by the models of endogenous growth postulated by Romer (1986) and Lucas (1988). The endogenous growth models stimulated the undertaking of empirical studies which moved towards an integrated and more robust analysis of the relationship between trade and economic growth. It is, therefore, settled in the literature that the transmission mechanism through which trade stimulates economic growth is from both static and dynamic gains from trade (Thirlwall, 2000)

In view of the foregoing, it is pertinent to ask whether Nigeria's recent economic woes can be attributed to her involvement in international trade/openness or whether the relative

growth can be attributed to gains from trade. Put differently, how significantly has trade impacted on Nigeria's economic growth performance? The basic objective of this paper is to examine this important question and proffer some solutions.

The rest of the paper is organized as follows. Section 2 presents the theoretical framework and transmission channels from trade to growth. Sections 3 contains the models specification. Section 4 then applies the Ordinary Least Squares (OLS) technique to estimate the specified models and presents the empirical results. Section 5 discusses the policy implications of using trade to promote growth in Nigeria based on inferences drawn from the empirical results. Section 6 summarizes the major findings of the study with concluding remarks.

THEORETICAL FRAMEWORK AND TRANSMISSION CHANNELS FROM TRADE TO GROWTH

This section presents the theoretical framework which explains the exact channels through which the gains from international trade are transmitted into the domestic economy thus stimulating growth.

Static Efficiency Gains

According to Ferrantino et al. (1997), static efficiency gains of trade refers to one – time benefits of international trade liberalization which arise as a nation's domestic prices become more closely aligned with the global price structure, and the resulting reallocation of resources that takes place within the economy in response to these price changes. The methods of measuring static efficiency gains by comparing the performance of the economy in two scenarios for a single year (in this case with and without trade liberalization) is referred to as comparative statics (Ferrantino et al. ibid).

Traditional methods of analyzing trade impact on economic growth relying on comparative statics, simulate the effects of trade policy at a single point in time, using available data for a single, historical base year, and consider only static efficiency gains from liberalization (Ferrantino et. al.ibid).

Dynamic Gains from Trade

There is a large and varied economic literature that examines the links between trade and economic growth through the dynamic gains from trade. They are dynamic in the sense that they relate to changes in an economy's structure through evolution over time (Stone and Shepherd, 2011). It also refers to effects on the rate of economic growth that are manifested over an extended period of time. Thus, the dynamic gains from trade are in contrast to the

traditional static gains from specialization by comparative advantage resulting in a one-off welfare gains (Stone and Shepherd, 2011). The specific dynamic gains from trade are outlined and discussed below:

(a) Trade and International Technological Diffusion.

International trade enhances the international diffusion of technology in several ways. First, commercial contacts between countries can serve as a source of information about new products and production processes. Second, international trade in technological information itself can take place through licensing contracts and joint ventures: such trade is facilitated by strong recognition of foreign intellectual property rights (Ferrantino et al., 1997).

Third, an important component of technology is embodied in new capital equipment, which is internationally traded. Fourth, international trade in capital through foreign direct investment carries with it a component of technology transfer. Barro and Sala-i-Martin (1995) point out that technological diffusion and imitation provide a powerful reason to expect international convergence of productivity and per capita income, independently of the arguments arising from the neoclassical model.

(b) Domestic Firms Learning – By – Doing

International trade leads to specialization and concomitant increasing experience in production enhances the productivity of workers in imitating domestic firms, and is also a way of accumulating technological knowledge (Arrow, 1962 cited in Ferrantino et al., 1997). Thus, the efficiency of production may increase over time (dynamic gains) with the accumulation of production experience by local firms.

Romer (1986) in a seminal formulation of modern endogenous growth theory states that learning-by-doing is assumed to take place in production with capital accumulation. Efficiency gains from international trade leading to increase in average product of capital can thus increase the growth rate of per capita income. Each firm's capital accumulation contributes to a social pool of knowledge on which all other firms in the economy can draw. These knowledge spillover effects between firms overcome the diminishing returns to capital (Romer, 1986).

(c) Product Variety and Quality Improvement

Variety in product availability and alternatives which engenders competition leads to quality improvement: trade enhances the efficiency of production to the extent the variety and/or quality of intermediate goods matters for productivity. Thus, alternative ways of conceptualizing technical change include expansion in the variety of products (Grossman and Helpman, (1991) and improvement in the quality of products may be of direct benefit to consumers (Barro and Sala-i- Martin, 1995).

Ferrantino et al. (1997) are of the opinion that there exists the possibility of enhancing the level of efficiency through trade liberalization which enhances the long-run growth rate. As it turns out, there are deep structural similarities between models of economic growth based on variety expansion and those based on quality improvement. In both cases, the public spillovers or externalities generated by technological improvements serve to stave off diminishing returns in physical capital, providing for long-run sustainability of economic growth.

(d) Human Capital Formation

The growth effects of human capital on international trade may vary depending on whether a particular country specializes in skilled-labour-intensive goods or unskilled-labour-intensive goods under free trade. For countries relatively well-endowed with skilled labour (that is the United States and other developed countries) international trade induces a shift toward the production of skilled-labour-intensive goods, providing incentives for more rapid increases in human capital, and greater economic growth.

For countries relatively well-endowed with unskilled labour (that is developing countries, international trade leads to increased importation of skilled-labour-intensive goods and increased domestic production of unskilled-labour-intensive goods, reducing the incentive to accumulate human capital, and thus the rate of economic growth (Stokey, 1991; Young 1991).

The possibility that international trade may cause a disincentive for human capital accumulation in the poorer countries does not automatically imply that it is detrimental to such countries, since the conventional static gaining to international trade may out weigh the reduced incentive to accumulate human capital. Moreover, developing countries may benefit directly from human capital accumulation in developing countries if there are international spillovers in knowledge (Forrantino, 1997).

(e) Allocative Efficiency, Mark-Ups and the Welfare Gains from Trade

According to Holmes, Hsu and Lee (2012), when some goods are monopolized and others are not, monopoly mark-ups distort the allocation of resources across goods. If trade barriers fall-off and firms that would otherwise have monopoly power are forced to compete with foreign firms, decreases in monopoly mark-ups affect welfare by reallocating resources across goods.

In their outstanding work, Arkolakis, Costinot and Rodriguez-Clare (ACR) (2012) derived a condition summarizing the welfare gains from trade that depends upon the aggregate share of expenditure on imported goods, as well as on elasticity parameter. The condition is valid across a variety of different models of the underlying sources of gains from trade, including the Ricardan framework of Eaton and Kortum (2002) as well as other frameworks such as Krugman (1980), and Melitz (2003). While these models differ in underlying microeconomic structure, in

terms of aggregate welfare they look alike, given the same observed aggregate trade flows (Holmes et. al. 2012).

Simply put, in the general ACR framework, to get welfare benefits from trade, we need to have trade, and measured trade flows provide a summary statistic of the benefits of trade. The starting point of this framework is the observation that a reduction in trade frictions can have impact, even if no trade is observed, if domestic firms are forced to change mark-ups to meet increased competition from foreign competitors. The threat of imports can affect resource allocation and these effects will not get picked up in trade statistics. It is an old idea that trade can matter even when unseen (Markusen,1981; Holmes, et. al. 2012).

(f) Trade Liberalization, Competition and Economic Growth.

It can be argued that trade liberalization intensifies competition for production factors, pushing the less efficient firms out of the market and, consequently, increasing industry average productivity. Atkeson and Burstein (2010), have considered a similar approach to study the effects of trade liberalization on firm's decisions to innovate. They find that the selection effect generated by trade openness increases firms' R&D investments. As a result, It has been theoretically stressed (Licandro and Ruiz, 2010) that there is a positive impact on economic growth through the pro-competitive role of international trade.

The pro-competitive effect of trade openness has consequently a positive effect on innovation and productivity growth. Trade barriers reinforce domestic firms' market power leading to low innovation and growth. Finally, since the number of firms affects innovation non-linearly, it can be theoretically argued that gains from trade are larger in the less competitive countries, as in autarky, since firms are more reactive in such an environment (Licandro and Ruiz, 2010).

EMPIRICAL LITERATURE REVIEW

Several studies, both in Nigeria and in other countries, have been carried out to examine the relationship between trade and economic growth. There seems to be a consensus from most of these studies that trade openness engenders economic growth. A review of some of the empirical literature is provided below in this section.

Jin (2000) investigated the effect of trade on economic growth of the rapidly growing economies in East Asia where rapid growth had been accompanied by a persistent openness to world trade. The framework of analysis was a five-variable vector autoregressive model that consists of real output, money supply, real government spending, foreign price shocks, and openness measures. The empirical results were emphatic that there was a positive and significant impact of trade openness on economic growth of East Asian countries.

Sinha and Sinha (2000) analyzed the effects of openness and investment on the growth of GDP for 15 Asian countries during 1950 to 1992. They developed a model which specified GDP growth as a function of growth rates of openness (export plus import), domestic investment and population. They found support for the proposition that the growth rate of GDP is positively related to the growth rates of openness and domestic investment. However, the relationship between the growth rate of GDP and the growth rate of population was not that clear cut.

An ingenious attempt to distinguish the channels through which international trade influences economic growth was carried out by Wacziarg (2001). He hypothesized that trade affects economic growth through six potential channels: (1) macroeconomic policy quality, (2) government size, (3) price distortions or black market premium,(4) investment share of GDP, (5) technology, and (6) foreign direct investment. He specified a simultaneous equations model consisting of an extended growth equation, an equation to capture the simultaneity between growth and trade, plus six channel equations in which an openness index is one of the explanatory variables. Wacziarg's results indicated that the most important channel through which trade influences economic growth is investment, accounting for 63 percent of trade's total growth effect. The technology channel (22.5 percent of trade's total growth effect), and stabilizing macroeconomic policy (18 percent of trade's total growth effect) account for nearly all of the remainder of trade's positive influence on growth.

Brummer (2003) estimated a dynamic panel model with panel data sets drawn from 125 countries over a 33 year period (1960 –1992) to explicitly test the hypotheses of no long-term effects of trade on income and income growth. The empirical results indicated that trade had a positive and significant effect on the level of income, but the effect on income growth though positive was non-robust to model specification.

Kim (2004) applied the instrument-variable (IV) threshold regressions approach of Caner and Hansen (2004) to investigate whether trade's contribution to standards of living and long-run economic growth varies according to the level of economic development using data on 61 countries over the 1960-1995 period. The empirical results indicated that greater trade openness had strong beneficial effects on growth and real income for the developed countries but significantly negative effects for the developing countries. The heterogeneity in the relationships of trade with growth and income suggested that greater international trade and integration may foster uneven development and hence contributed to more diverging economies. In addition, trade seemed to exert its influence via the productivity channel for higher-income countries.

Uddin and Chakraborty (2009) employed the co-integration and Granger causality tests to investigate long-run relationship and the direction of causality between financial development,

international trade and real income growth in Bangladesh. The results of the study did not reveal any long-run relationship between economic growth and financial development as scaled by money supply and domestic credits, and between exports and economic growth. On the other hand, Granger causality test results suggested that the export-led growth hypothesis can be inferred for Bangladesh economy in the short run.

The work of Baliamoune-Lutz and Ndikumana (2007) took an exciting dimension by ambitiously attempting to explore the argument that one of the causes for the limited growth effects of trade openness in Africa may be the weakness of institutions. The results from application of Arellano-Bond GMM estimations on panel data from African countries indicated that institutions play an important role in enhancing the growth effects of trade. Moreover, they found that the joint effect of institutions and trade has a U-shape, which suggested that as openness to trade reaches high levels, institutions play a critical role in harnessing the trade-led engine of growth.

In a related research, Sun (2010) investigated the role of international trade in China's economic growth. For the econometric approach, a stochastic frontier production function was estimated and province specific determinants of inefficiency in trade identified. The study demonstrated that increasing participation in the global trade helps China reap the static and dynamic benefits, stimulating rapid national economic growth. Both international trade volume and trade structure towards high-tech exports result in positive effects on China's regional and participation in international trade. Policy implications are drawn from the empirical results accordingly.

Ulasan (2012) revisited the empirical evidence on the relationship between trade openness and long-run economic growth over the sample period 1960-2000. He adopted the empirical framework of the augmented neo-classical growth model suggested by Mankiw et al. (1992) for investigation of the openness-growth link. The empirical results indicated that many openness variables were positively and significantly correlated with long-run economic growth. However, in some cases, these results were driven by the presence of a few outlying countries. Adding to the fragility of the openness-growth association, the significance of openness variables disappeared once other growth determinants, such as institutions, population heterogeneity, geography and macroeconomic stability were accounted for and entered into the model.

Busse (2012) applied a panel dataset for 108 countries (of which 87 are developing countries) covering the period 1971-2005 (1970-2005 for the GDP per capita variable) to examine the causal relations between trade and economic growth. He drew from the System GMM estimator suggested by Arellano and Bover (1995) and Blundell and Bond (1998) to solve

the difficulties of empirical growth regressions. The empirical results revealed that trade does indeed have a positive and significant impact on growth. He found evidence that the expansion of trade, e.g., through its associated access to additional technologies, has a significant impact on income growth as well. In addition, he showed that both channels, trade and the expansion of trade, have an independent influence on GDP per capita growth. The same results were true for both exports and imports separately.

Alimi and Atanda (2011) empirically examined the effect of globalization on economic growth in Nigeria between 1970 and 2010 amidst cyclical fluctuations in foreign investments. They employed an autoregressive model that regressed real gross domestic product on trade openness, cyclical foreign investment to gross domestic products, external reserves, debt stock and exchange rate. The empirical results revealed that globalization has positive and significant effect on economic growth in Nigeria, while the positive effect of business cycle on real output growth was insignificant. Also, external reserves tended to significantly shield the economy from external shocks and the international relative prices stabilized the growth rate of real output in Nigeria.

The study by Atoyebi et al. (2012) empirically examined the impact of international trade on economic growth in Nigeria from 1970-2010. The empirical investigations revealed that three variables were statistically significant at 5% level, and these variables were export, foreign direct investment and exchange rate and they were positively related to real GDP while other variables such as import, inflation rate, openness exerted a negative influence on real GDP. The study demonstrated that increase participation in global trade helped Nigeria to reap static and dynamic benefits of international trade despite non-conformity of the coefficient of the openness variable in line with priori expectations.

In what can be classified as a unique study because of the way the variables were interacted, Alajekwu, Ezeabasili and Nzotta (2013) investigated the effect of trade openness on stock market development and economic growth of Nigeria. They employed annual time series data of 26 years (1986 – 2011). The ADF test revealed stationarity of the variables at first difference. The Johansen multivariate cointegration test confirmed a long-run co-integrating relationship among the variables at 5% level of significance. In addition, the regression estimates showed that trade openness response to stock market development did not have significant effect on economic growth. The pair wise granger causality test showed that there was no causal relation between trade openness and economic growth on one hand; and trade openness and stock market development on the other hand.

Adelowokan and Maku (2013) examined the effect of trade and financial investment openness on economic growth in Nigeria between 1960 and 2011.Estimates from the reported

dynamic regression model indicated that trade openness and foreign investment exert positive and negative effect on economic growth respectively. Also, the empirical results showed that the partial adjustment term, fiscal deficit, inflation and lending rate were growth increasing during the reviewed periods. Further tests also indicated a long-run relationship among trade openness, foreign investment, and economic growth in Nigeria between 1960 and 2011

METHODOLOGY AND MODEL SPECIFICATION

An economic model represents the basic features of an economic phenomenon (Fonta, Ichoku and Anummudu, 2003). Two models derived from static efficiency and dynamic gains theories of trade were estimated. The first model was estimated to empirically ascertain the degree of structural break on the Nigerian economy following the trade liberalization policy of 1986. The second model was estimated to empirically ascertain the impact of trade on economic growth of Nigeria. Based on the theoretical literature and empirical review, the following models were specified:

Specification of Model 1

In this model we regressed real GDP at 1990 constant prices on trade variables (export+import/ GDP). In addition, we introduce a dummy variable to examine the degree of structural shift that took place in the Nigerian economy as a result of the trade liberalization policy of 1986. In view of the above we specified the following model drawn from Gujarati and Porter (2009) as follows:

$RGDP_t = a_1 + a_2D_t + a_3TRD + a_4 (D_tTRD_t) + U_t$ …….. (3.1)

Where:

GDP_t = GDP at 1990 constant prices

D_t = dummy variable of trade openness taking 0 between 1970 and 1985 and 1 between 1986 and 2010

TRD_t = the degree of openness measured as trade/GDP ratio, i.e

(import+export)/ GDP

D_tTRD_t = a dummy variable which represents the interactive or multiplicative form of trade and time.

a_1 = the intercept of both periods.

a_2 = the differential intercept to enable us distinguish between the intercepts of the two periods.

a_3 = slope coefficients for both periods.

a_4 = the differential slope coefficient indicating how much the slope coefficient of the second period's growth function (the category that receives the dummy value of 1) differs from that of the first period (the category that receives the dummy value O).

U_t = stochastic error term (Gujarati and Porter, 2009).

For the purpose of regression analysis we reformulated model (3.1) into the following logarithm form as follows:

$InRGDP = b_1 + b_2D_t + a_3TRD + b_4 (D_tTRD_t) + U_t$ ……. (3.2)

Where:

InRGDP = natural logarithm of GDP at 1990 constant prices

After regressing equation (3.2), the two policy episodes are shown by assigning 0 to D_t in the pre-liberalization and 1 to the post-liberalization period. With assumption of homoscedasticity, two equations can be derived from ANCOVA model (refer to equation 3.2). The first equation is the mean of Nigeria's total real GDP function for first period while the second equation is the mean of Nigeria's total real GDP function for second period as shown below:

$E (InRGDP/D_t) = b_0 + b_1TRD_t$ ……. (3.2.1)

$E (InRGDP/D_t) = (b_0 + b_1) + (b_2 + b_3) TRD_t$ ……..…… (3.2.2)

Specification of Model II

For the second model we drew from Pahlavani (2005) and Obadan (2013), we regressed GDP at 1990 constant prices on trade factors (oil export, non-oil export, and import), inflation rate and exchange rate. The model is expressed as follows:

$RGDP_t = b_0+ b_1OEX_t + b_2NOEX_7 + b_3IMP_t + b_4INF_t + b_5RER + b_6TREND + a_t$… (3.3)

Where:

$RGDP_t$ = GDP at 1990 constant price

OEX_t = oil export

$NOEX_t$ = non-oil export

IMP_t = import

INF_t = inflation rate

RER_t = real naira exchange rate

TREND = chronological arrangement of time

$b_o – b_6$ = parameters of variables to be estimated

u_t = stochastic error term

For the purpose of regression analysis, we reformulated equation (3.3) in its logarithm form as follows:

$InRGDP_t = b_0 + b_1InOEX_t + b_2InNOEX_7 + b_3InIMP_t + b_4INF_t + b_5RER_t + b_6TREND + e_t$… (3.4)

They are transformed into natural logarithm because as argued by Al-Fayoumi (2009), logarithmic forms tend to reduce the scale of variables, which is a desirable quality when analyzing the time-series properties of the variables before their relationship can be established. Therefore, the variables are transformed into natural logarithm in order to include the proliferative effects of time series (Al-Fayoumi 2009).

As for the algebraic signs of the parameter estimates, the a priori theoretical expectations are as follows:

$\frac{\partial \ln RGD_t}{\partial \ln OEX_t} > O$ $\frac{\partial \ln RGDP_t}{\partial NOEX_t} > O,$ $\frac{\partial \ln RGD_t}{\partial IMP_t} > O$

$\frac{\partial \ln RGD_t}{\partial \ln F_t} < O$ $\frac{\partial \ln RGDP_t}{\partial \ln RER_t} < O,$ $\frac{\partial \ln RGDP_t}{\partial TREND} > O$

ANALYSIS AND EMPIRICAL RESULTS

Testing Stationarity of Time Series of Macroeconomic Variables.

This section presents the stationarity test of the time series of the macroeconomic variables that were used to carry out the regression analysis. Test of stationarity of the data before carrying out regression analysis is very important because if the dependent and independent variables have unit roots then the regression results will be spurious and analytically meaningless for policy prescriptions. In table 1 below is presented the results of stationarity test of all variables at levels.

Table 1: Results of ADF Test (Series in Original Form/Levels)

Variables	Order of Integration	t-statistics	Significance Level	Critical Level
LOG GDP_t	1(0)	-0.6584	5%	-3.5298
LOG $OEXP_t$	1(0)	-2.4327	5%	-3.5266
LOG $NOEXP_t$	1(0)	-2.2787	5%	-3.5331
LOG $TOLMP_t$	1(0)	-2.0469	5%	-3.5331
INF_t	1(0)	-3.1608	5%	-3.5331
EXR_t	1(0)	-1.4473	5%	-3.5331
$TRADE_t$	1(0)	-3.9349	5%	-3.5331

On the basis of Augmented Dickey-Fuller (ADF) testing, we can conclude that the series RGDP, OPEN, OEXP, NOEXP, TOIMP, INF and EXR are non-stationary at levels. This conclusion is drawn because the calculated ADF statistic for each of the variables is greater than or less

negative than the critical ADF value at the 5% significance level. As one requirement for use of the method of ordinary least squares in estimation of parameters for equations of the linear model is that the variables should be stationary, it was necessary to carry out the stationarity test of the lagged first difference terms with the goal of solving the problem of non-stationary time series. The results of the ADF test of the lagged first difference terms of the variables are presented in table 2.

Table 2: Results of ADF Test (Series in First Difference)

Variables	Order of Integration	t-statistics	Significance Level	Critical Level
$D(LOG\ GDP_t)$	1(1)	-4.998	5%	-3.5298
$D(LOG\ OEXP_t)$	1(1)	-6.5842	5%	-3.5298
$D(LOG\ NOEXP_t)$	1(1)	-6.8778	5%	-3.5298
$D(LOG\ TOLMP_t)$	1(1)	-7.0827	5%	-3.5298
$D(INF_t)$	1(1)	-6.1172	5%	-3.5331
$D(EXR_t)$	1(1)	-5.8375	5%	-3.5298
$D(TRADE_t)$	1(1)	-9.769	5%	-3.5298

From the results presented in Table 2, it is quite apparent that the first differencing of the variables makes them stationary, that is they are all integrated of order 1(1) process. However, it is possible that these series contain a common stochastic trend and their regression will not necessarily be spurious. In this case, despite the disequilibrium in short term trend, they will move together over time such that will be co-integrated.

Testing for Co-Integration

In the econometric literature different time series data will be co-integrated if they have a long term, or equilibrium relationship between them. Furthermore, first differencing makes them both stationary i.e. both are integrated of order I (1) processes but their differenced values are I(0). Based on the results of table 2, the next step was to carryout co-integration test.

To overcome the major shortcoming of the Engle-Granger co-integration technique that was adopted for this study, we first carried out individual cointegration tests between the dependent variable and each of the independent variables. To achieve this, we ran the regression of the dependent variable on each of the independent variables and obtained the co-integration regression analysis result. Then we obtained the residuals from individual regression $u_{t,,}$ and carried out a co-integration test on the residuals in order to find out whether u_t is

stationary. If the u_t that is the residual term, which is a linear combination of the two series, is stationary, there is co-integration between the two variables despite that they are 1(1) processes.

Since the individual co-integration regression results are not of importance here, they are not presented. Rather, we present the Augmented Dickey Fuller Test of the residuals from each of co-integration regression in Table 3.

Table 3: ADF test on Residuals of Cointegration Regression between Real GDP and individual independent variables

Integration Statistics	Coefficient	t-statistics	prob(t)
D(RESDOEXPt)	1.0374	3.2891	0.0346
D(RESDNOEXPt)	1.11708	2.3147	0.0436
D(RESDIMPt)	2.881	2.8368	0.0431
D(RESDINFt)	-1.1291	-3.622	0.0214
D(RESDERTt)	-2.5413	-2.5413	0.0354

From Table 3, the unit root test on the residuals, u_t, from the co-integration regression, we found that t-statistic of all the variables are statistically significant because their respective Prob (t); oil exports 0.03, non-oil exports 0.04, imports 0.04, inflation 0.02, and exchange rate 0.01, are less than the alpha or 0.05. Thus, we reject the null hypothesis of no co-integration in favour of the alternative that there is co-integration between real GDP and each of the variables. Thus, there exists a long-run equilibrium relationship between RGDP and each of macroeconomic variables. The next step was the estimation of multiple co-integration of Real GDP on oil exports, non-oil exports, imports, interest rate and exchange rate. As was done above, we subjected the residual of the multiple co-integration regression to stationarity test and the results are presented in Table 4.

Table 4: Multiple Co-integration Regression between Oil Exports, Non-Oil Exports, Imports, Inflation, Exchange Rate and Real GDP, 1970-2010.

Augmented Dickey-Fuller Test Equation				
Dependent Variable: (COINREGRES) Method: Least Squares				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
COINREGRES(-1)	-1.166810	0.318188	-3.667050	0.0384
C	0.004433	0.018871	0.234895	0.8156
@TREND("1970")	0.000125	0.000804	0.155942	0.8769

From Table 4, the ADF test on the residuals of multiple co-integration regression confirms co-integration then there is an equilibrium long run relationship between GDP and the variables stipulated in the model.

Once we established the existence of co-integration, that is the existence of equilibrium long-run relationship among the variables, we proceeded to study the short-run dynamics by estimating an error-correction model. This was done to enrich our understanding of how the series adjust to long-run equilibrium when and if they deviate in the short-run from the stable pattern of long-run behavior.

Results from Estimated Regression Equations

Regression Results to Test for Structural Break in the Nigerian Economy- Equation 3.2

Table 5: Regression of Structural Break in the Nigerian Economy

Dependent Variable: LOG ($RGDP_t$)

Method: Least Squares

Variable:	Coefficient	t-statistics	Std. Error	prob(t)
C	11.9887	0.3887	30.8396	0
DUMMYt	0.4891	0.5264	0.9209	0.3589
TRADEt	0.0042	0.0101	0.4116	0.683
D_TRADEt	0.0015	0.0117	0.1298	0.8974
R-Squared = 0.5444 Adjusted R-Squared = 0.5407				
F-Statistic = 14.7364 prob (F-Statistic) = 0.000				
Durbin-Watson Statistic = 0.3996				

Diagnostic Test

Serial correction	Breusch-Godfrey LM Statitic	32.7839
Normality	Jarque-Bera Statistic	3.2776
Heteroskedasticity	Breusch-Pagan-Godfrey Statitic	13.1492
Functional form	Ramsey RESET F Statistic	8.28120

The diagnostic tests indicate serial correlation and an incorrect functional form as the F-Statistic of the Breusch-Godfrey LM and Ramsey RESET tests are above the critical level. To solve the problem, we introduced an autoregressive process, ar(1), into the model. The new estimated equation with the ar(1) process is presented in Table 6.

Table 6: Re-estimated Model of Structural Break in the Nigerian Economy, with AR(1)

Dependent Variable: LOG ($RGDP_t$)

Method: Least Squares

Variable:	Coefficient	t-statistics	Std. Error	prob(t)
C	10.9575	0.6223	17.6069	0
DUMMYt	0.149	0.0696	2.1422	0.0392
TRADEt	0.0085	0.0022	3.7605	0.0006
DTRADEt	0.0085	0.0023	3.7679	0.0006
AR(1)	1.033	0.0141	73.1899	0

R-Squared = 0.9917 Adjusted R-Squared = 0.9907

F-Statistic = 38.5213 prob (F-Statistic) = 0.000002

Durbin-Watson Statistic = 1.4842

	Diagnostic Test	
Serial correction	Breusch-Godfrey LM Statitic	2.7147
Normality	Jarque-Bera Statistic	5.2171
Heteroskedasticity	Breusch-Pagan-Godfrey Statitic	2.8865
Functional form	Ramsey RESET F Statistic	5.1803

Diagnostic tests all indicate acceptance of the null hypotheses at the 5% significance, thus the model is free from autocorrelation and heteroskedasticity, while the error terms are normally distributed and the model well-specified. The regression results as shown in Table 4.6 are quite satisfactory. The signs of the parameters of the explanatory variables conform to a priori expectations. Specifically, trend, trade openness, the dummy variable and dummy/trade variable are all increasing functions of log of real GDP. However, there is no need for detailed interpretation of Table 6, because it was estimated only to test the null hypothesis of no structural break in the Nigeria economy following trade liberalization under SAP in 1986.

The variable of primary interest in Table 6 is the coefficient estimate of the dummy/openness variable or what is referred to as the drift operator. In view of the fact that the Prob (t) of the drift operator of 0.03 is less than 0.05 then it is statistically significant at the 5% level. In addition, the F-statistic has a probability (F) of 0.0002 which is less than 0.05, is an indication of the statistical significance of the overall regression result. Thus, there was a structural break in the Nigeria economy due to international trade liberalization in 1986 and the economy experienced static gains of trade as articulated by Ferrantino et al. (1997). .

Regression Results from Estimated Equation 3.3 – Effects of Oil Exports, Non-oil Exports, Imports, Inflation and Exchange Rate on Economic Growth

Table 7: The Long-Run Relationship between Oil Exports, Non-Oil Exports, Imports, Inflation, Exchange Rate and Economic Growth in Nigeria

Dependent Variable LOG(RGDPt)				
Method. Least Squares				
Variable:	Coefficient	t-statistics	Std. Error	prob(t)
C	11.6743	4.2123	2.7711	0.0412
LOG(OEXPt)	0.0678	0.0255	2.6519	0.0421
LOG(NOEXPt)	0.0522	0.0569	0.9169	0.3656
LOG(TOIMPt)	0.0701	0.033	2.2735	0.0431
INFt	-0.0508	0.1186	-0.4288	0.6711
EXRt	-0.0315	0.0073	-4.3191	0.0051
TRENDt	0.0109	0.008	1.3654	0.1811
R-Squared = 0.9549 Adjusted R-Squared = 0.9469				
F-Statistic = 19.9059 prob (F-Statistic) = 0.022201				
Durbin-Watson Statistic = 1.8645				

Diagnostic Test

Serial correction	Breusch-Godfrey LM Statitic	4.9077
Normality	Jarque-Bera Statistic	3.7104
Heteroskedasticity	Breusch-Pagan-Godfrey Statitic	5.0834
Functional form	Ramsey RESET F Statistic	4.5584

Diagnostic tests all indicate acceptance of the null hypotheses at the 5% significance; thus the model is free from autocorrelation and heteroskedasticity, while the error terms are normally distributed and the model well-specified. The variables of interest, as far as the focus of this study is concerned are oil exports, non-oil exports and imports. We concentrate our analysis of regression results mostly on their performances in the regression equation. Inflation rate and exchange rate were introduced into the model to moderate the impact of internal and external instability on the Nigerian economy.

The result expressed in Table 7 is quite satisfactory as per the signs of the estimated coefficients. The signs of estimated oil exports, non-oil exports and imports coefficient estimates were positive, a priori, while those of inflation and exchange rate were negative. This implies

that economic growth is an increasing function of trade variables (exports and imports) and a decreasing function of internal and external instability (inflation and exchange rate).

The statistical characteristics of equation are also satisfactory. The oil exports, imports and exchange rate parametric estimates are statistically significant at the 5% level because the respective prob (t) of 0.04, 0.04 and 0.01 are less than 0.05. On the other hand, the parameter estimates of non-oil exports and inflation are statistically insignificant at the 5% level because the respective prob (t) of 0.37 and 0.67 are greater than 0.05. Finally, the overall regression estimates are statistically significant at the 5% level because the prob (F) of the F-statistic is 0.02 which is less than 0.05.

Error Correction Model

The error correction model for growth-trade relationship was estimated in order to simulate its short-run dynamics given that the variables are cointegrated. Experimentation and testing with addition of various lagged values of the explanatory variables (to ensure that the error term is white noise) yielded the final model reported in Table 8.

Table 8: Error Correction Model: Short-Run Relationship Between Oil Exports, Non-Oil Exports, Imports, Inflation, Exchange Rate and Growth in Nigeria, 1970-2014

Dependent Variable LOG(RGDPt)				
Method. Least Squares				
Variable:	Coefficient	t-statistics	Std. Error	prob(t)
C	0.028523	0.010152	2.809696	0.0086
D(LOG($OEXPt_{-1}$))	0.021402	0.016979	1.2605	0.2172
D(LOG($NOEXP_{t-1}$))	0.025791	0.02069	1.246536	0.2222
D(LOG($TOIMP_{t-1}$))	0.029819	0.023994	1.242774	0.2236
D(INF_{t-2})	-0.00848	0.009216	-0.92033	0.3647
D(EXR_{t-2})	-0.04133	0.02558	-1.61552	0-1167
ect $_{t-1}$	-0.63847	0.205645	-3.10474	0.0092
R-Squared = 0.5219 Adjusted R-Squared = 0.5163				
F-Statistic = 3.6494 prob (F-Statistic) = 0.0417				
Durbin-Watson Statistic = 1.562277				

Diagnostic Tests		
Serial correction	Breusch-Godfrey LM Statitic	1.1506
Normality	Jarque-Bera Statistic	1.1645
Heteroskedasticity	Breusch-Pagan-Godfrey Statitic	5.5946
Functional form	Ramsey RESET F Statistic	0.3658

Diagnostic tests all indicate acceptance of the null hypotheses at the 5% significance, thus the model is free from autocorrelation and heteroskedasticity, while the error terms are normally distributed and the model well-specified. In the model, the constant is significant and other coefficients are statistically insignificant at the 5% level. The sign of oil-exports, non-oil exports and imports are positive, a priori, while that of inflation rate and exchange rate are negative. The coefficient for residuals ect (t_{-1}) has the correct negative sign, and confirms disequilibrium in the model. The high coefficient of 0.6384 suggests that the discrepancy due to short term disequilibrium is corrected fairly quickly, that is 63.84% of the discrepancy between actual growth and the disequilibrium is corrected over a one year period.

POLICY IMPLICATIONS: USING TRADE TO PROMOTE GROWTH IN NIGERIA

Trade is central to the growth prospects of developing countries such as Nigeria. The association between trade and growth has long been debated and strongly reaffirmed recently by Krueger (1997) and Srinivasan and Bhagwati (1999). Our empirical results from the study have generated interesting insights into the growth – trade nexus.

The conventional wisdom, based on the performance of the East Asian economies, was that the principal impulse was through exports. Trade enlarged the markets for domestic producers, allowed them to reap scale economies, forced them to be competitive, and offered incentives and opportunities to assimilate new technologies. Export earnings also loosened foreign exchange constraints on the economy thereby facilitating the expansion of other sectors. The suggestion here is that policy direction should flow to the neo-mercantilist approach that leans towards the grooming of selected industries with comparative trade advantage and export potential which should be favoured with protection against import competing industries. This is responsible for the continuing popularity of export – led growth, the emphasis on manufacturing activities, and the prevalence of high trade barriers in many developing countries.

However, our empirical results show that we have to modify our perspective and policy thrust in a number of ways:

- The statistically insignificant coefficient of non-oil exports indicates that the Nigerian economy derived modest gains in total factor productivity (TFP) from exports, through the mid-1980s. It is well established that companies which thrived as exporters are the ones that are able to cross a productivity threshold prior to engaging in trade. From our results, exports were certainly a source of demand but growth was driven mainly by factor inputs and not by efficiency and technological gains arising from export – push.
- The use of import protection by Nigeria gives room for distortions in the prices of capital goods and encourages industrial policies which can be a source of rents. Also, such

protectionist policies may have dampened the non-oil export performance of Nigeria through the 1980s. Furthermore, imports (given its statistical significance in the regression results) may be an important vehicle for technology transfer embodied in equipment and the technical assistance provided by suppliers (Rodriguez-Clare, 1996). Imports also force the contraction of inefficient producers and induce survivors to become competitive by adopting a range of superior practices, techniques and product refinements. For both of these reasons imports can have a stronger link with total factor productivity and growth than exports, as revealed by our empirical results.

- Finally, Nigeria's comparative advantage over the foreseeable future lies in agricultural commodities, light manufactures and assembly type activities which will enhance her access to export markets. However, from our empirical results the inference is quite strong that these activities which fall under non-oil exports of Nigeria are not significantly contributing to economic growth of the country at the present.

RECOMMENDATIONS

Based on the empirical results of this study and other findings from the literature, the following recommendations are suggested:

(1) There is a need for greater openness of the Nigerian economy to international trade; greater openness will help domestic firms to become a part of the international production networks and supply chains that are the main conduits of modern trade. Global supply chains organizing production and trade are of two forms: there are producer driven commodity chains run by transnational corporations (TNCs) in industries subject to entry barriers from capital intensity, technology or proprietary information and there are chains managed by large retailers, name brand marketers and trading companies that place orders with local producers and supply the design, specifications and, in some cases, the materials as well.

(2) Trade related policies should focus on the need to achieve export competitiveness which is greatest in domestic resource intensive industries which can benefit from access to locally available inputs and technical skills. For example, Malaysia and Indonesia entered the export market with natural resource products and these still remain the mainstay of their export drive. India and Bangladesh are competitive in labour intensive low-end cotton garments and textiles. Once the Nigerian economy has an established reputation in exports markets and build up a production base, it can pursue other possibilities with superior growth prospects over the longer term. The creation of an

outward - oriented industrial base, however small and specialized, is also a source of strong signal to foreign investors.

(3) Future trade policies should focus on scaling back barriers to imports of technologically intensive capital goods. Industrialization and growth are more likely to draw impetus from rising productivity and participation in international production networks, if barriers to imports of goods are scaled back. In many instances, tariffs on capital goods and intermediates yield little revenue because of evasion or exceptions, but they do introduce distortions, raise transaction costs of producers, reduce foreign direct investment (FDI) and discourage import substituting industries from striving after competitiveness.

(4) Trade policies should be designed and implemented to encourage domestic and foreign investment in services and expose local suppliers to competition at least as important as those directed towards manufacturing. For a developing economy such as that of Nigeria, services is a promising leading sector. The declining costs of supplying particular kinds of services using electronic channels is rapidly lowering entry barriers for countries willing to invest in technical skills as well as physical information (IT) infrastructure. In fact, the market for a wide range of existing and emerging services is on the way to becoming more globalized than the markets for goods. Data processing and call centers are already migrating to developing countries. More sophisticated services could quickly follow if countries take the necessary initiatives. For these reasons, Nigeria should take advantage of the expanding coverage of GATTS to cover all services and greater transparency in rules influencing market access which should produce a large payoff to the domestic economy.

(5) It is also important for Nigeria's trade policy to focus on building export capacity as a major policy objective. Also, of equal importance is the methodological sweeping aside of trade barriers. There is a scope for Nigeria to take the initiative to launch a new round of trade negotiations with her leading trade partners and which could draw the economy into the mainstream of globalization. The danger is that, in the absence of such initiative, Nigeria may not benefit from globalization as it will be monopolized by a few countries, while the shocks and setbacks, if they are severe such as that of 2008/2009, will spill over into the domestic economy. The urgent policy decision is to invest in the skills and knowledge required to define priorities, win the domestic political battles and to engage purposefully but flexibly in trade negotiations. Although Moreira and Najbert (2000) argued that trade liberalization can lead to loss of jobs in the short-run, over the longer run this is outweighed by a more labour intensive output mix. While multilateral trade

liberalization, with reciprocal concessions, is the more attractive avenue, the gains from unilateral reduction in trade restrictions can benefit growth and serve as a bargaining in future trade negotiations, whether regional or international (World Bank, 1999).

CONCLUSION

The theory of trade postulates that an economy that is open to international trade would be stimulated by the static gains (structural break) and dynamic gains (total factor productivity) of trade. This study was carried out using macroeconomic data of the Nigerian economy between 1970 and 2014 to establish the nexus between trade and growth. The estimated econometric models demonstrated, that: one, there was a structural shift in Nigeria's economic growth trajectory following opening of the economy in 1986, and two, growth has a positive and significant relationship with oil exports and imports, positive but insignificantly relationship with non-oil exports, negative and insignificant relationship with inflation, and negative and significant relationship with exchange rate. The policy implications drawn from the empirical results are that Nigeria's economic growth is over reliant on oil exports and imports, whereas the non-oil sector has a positive but insignificant impact on growth. The findings suggest that the future of Nigeria's growth trajectory as it relates to trade lies in improving the total factor productivity of domestic resource intensive industries (especially in the non-oil sector) through diversification, scaling back trade barriers and encouraging domestic and foreign investment in service industry.

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