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Empirical Analysis of Trade Liberalization and Economic Growth in Nigeria, 1980-2013

ABSTRACT: *The trade liberalization is necessary and has positive effects for development, and on the growth performance of the industrial sector, constituted an increasingly controversial issue. The origin of trade liberalization and market-oriented economic reform in many developing countries began in the early 1980s and intensified in the 1990s. The reform takes various forms in terms of ownership and contents in different countries. The paper accesses the impact of trade liberalization on economic growth in Nigeria for the period 1980-2013. Two equations were estimated: firstly, made index of industrial production as a function of trade openness, terms of trade, and real exports; and, secondly, equation made real gross domestic product as a function of trade openness, terms of trade, real export, and trade liberalization dummy. The study employs a vector error correction model, quantitative method, and economics approaches. The results show that openness of the foreign sector and trade liberalization dummy have positive significant impact on both industrial performance and economic growth in Nigeria. It is recommended the removal of impediments to trade, such as excessive import levies and arbitrary tariffs.*
KEY WORD*: Trade Liberalization; Index of Industrial Production; Real Gross Domestic Product; Co-Integration; Vector Error Correction Model.*

IKHTISAR*: "Analisis Empiris Liberalisasi Perdagangan dan Pertumbuhan Ekonomi di Nigeria, 1980-2013". Liberalisasi perdagangan diperlukan dan memiliki efek positif untuk pembangunan, dan tentang kinerja pertumbuhan sektor industri, merupakan isu yang semakin kontroversial. Asal-usul liberalisasi perdagangan dan reformasi ekonomi berorientasi pasar di banyak negara berkembang dimulai pada awal 1980-an dan diintensifkan pada 1990-an. Reformasi mengambil berbagai bentuk dalam hal kepemilikan dan konten di berbagai negara. Makalah ini menguji dampak liberalisasi perdagangan pada pertumbuhan ekonomi di Nigeria untuk periode 1980-2013. Dua persamaan diestimasi: pertama, membuat indeks produksi industri sebagai fungsi keterbukaan, syarat perdagangan, dan ekspor riil; serta, kedua, membuat persamaan produk domestik bruto riil sebagai fungsi keterbukaan, syarat perdagangan, ekspor riil, dan dummy liberalisasi perdagangan. Penelitian ini menggunakan model koreksi kesalahan vektor, metode kuantitatif, dan pendekatan ekonomi. Hasilnya menunjukan bahwa keterbukaan sektor asing dan dummy liberalisasi perdagangan memiliki dampak positif yang signifikan terhadap kinerja industri dan pertumbuhan ekonomi di Nigeria. Direkomendasikan untuk menghapus semua hambatan perdagangan, seperti pungutan impor berlebihan dan tarif sewenang-wenang.*
KATA KUNCI*: Liberalisasi Perdagangan; Indeks Produksi Industri; Produk Domestik Bruto Nyata; Ko-Integrasi; Model Koreksi Kesalahan Vektor.*

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INTRODUCTION

The conventional views that trade liberalization is necessary and has positive effects for development, and on the growth performance of the industrial sector, constitute an increasingly controversial issue. The origin of trade liberalization and market-oriented economic reform in many developing countries began in the early 1980s and intensified in the 1990s (Duncan & Quang, 2005). The reform takes various forms in terms of ownership and contents in different countries.

Countries undertaking reforms can be classified into three groups. The first group includes a number of countries in East Asia, which continued their own dynamic industrial and trade policies in the 1960s. The second group consists of a number of countries, mostly in Africa, whose reforms were tailored towards that advocated by the IFIs (International Finance Institutions). The last group was made up of a good number of Latin American countries, who embraced economic reform in the early 1980s under the pressure from IFIs. Nevertheless, they intensified their reform process without necessarily be under pressure of those institutions in all cases in the 1990s (Duncan & Quang, 2005; and Shafaeddin, 2005).

However, the contents and philosophy of their reform programmes were similar to those designed by the IFIs, which in turn have been referred to as the "Washington Consensus" (*cf* Shafaeddin, 2005; and Aiyedogbon & Ohwofasa, 2016). Universal and uniform trade liberalization was a part of that "consensus". The word "universal" implies that all developing countries are to follow the same trade policy regime irrespective of their levels of development and industrial capacities. On the other hand, "uniform" implies that all sectors and industries are to be subject to the same tariff rates that may be zero rate or low rate (Akyuz, 2005; Shafaeddin, 2005; and Aiyedogbon & Ohwofasa, 2016).

Thus, the reform programmes undertaken by these countries was not limited to trade liberalization, but included others, such as capital account liberalization; devaluation at the early stages of reform to compensate for trade liberalization; and fiscal and financial reform through contractionary macro-economic policies, such as budget cuts, increase in interest rates, and privatization (Shafaeddin, 2005; and Aiyedogbon & Ohwofasa, 2016).

In developing countries, trade liberalization has been a veritable tool of policy advice to developing countries over the last two decades. A number of benefits are derived from this policy, in which economic growth is probably the most talk about (Haberler, 1988; and Monisola, 2014). This has prompted many economists to conduct researches into the relationship between trade liberalization and economic growth in several countries. Consequently, a number of empirical studies have been carried out (WB, 1987), where several studies have shown that there is a positive relationship between openness and economic performance (Matin, 1992; Haberler, 1988; and Aiyedogbon & Ohwofasa, 2016). However, others have found no significant relationship (Adebiyi, 2006; Monisola, 2014; and and Aiyedogbon & Ohwofasa, 2016).

In the view of A.F. Adenikinju & M. Olofin (2000), trade policy might affect industrial growth through a number of channels. In the first place, a less protectionist trade regime increases scale efficiency through enlarging the domestic market that hitherto might be too small for the efficient production of goods that show increasing returns to scale. Secondly, a more liberal trade regime leads to increased competition from abroad and, thus, forcing domestic firms to adopt more efficient technology that would reduce

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inefficiency and waste. Finally, trade liberalization eases foreign exchange constraints faced by most developing countries and, hence, enables a country to import needed raw materials and capital goods and this results to results in a faster rate of technological progress (Adenikinju & Olofin, 2000).

In the latter case, P.M. Romer (1990) argued in the spirit of endogenous growth literature that trade openness may increase growth rates in the long run by generating economies of scale, operating through research and development (R&D) and knowledge spill-overs, human capital accumulation, and learning-by-doing (Romer, 1990).

In Nigeria, considerable amount of discussion on the inter-relationship between trade policy reforms, economic performance, and industrial growth abounds. However, in recent times, there appears to be a dearth of empirical studies on the impact of trade liberalization on industrial growth performance in Nigeria (Ebong, Udoh & Obafemi, 2014).

The only exception was the work of M.A. Adebiyi (2006). One a striking similarity of existing empirical studies in the literature is that the problem of spurious estimates has not been satisfactorily addressed. Thus, the interpretation of such regression results has been considered inadequate for economic analysis and forecasts (Adebiyi, 2006). It is against this background, that the study is undertaken.

The objective of this paper, therefore, is to examine the relationship between trade liberalization policy and the growth of the industrial sector in Nigeria. The rest of the paper is organized as follows: section two provides review of related literatures. Section three contains the methodology, which includes model specification and econometric technique. In section four, the result of findings is presented and interpreted, while the conclusion and policy recommendations are made in the last section.

Literature Review. Adam Smith (1776 and 1976) was among the early economists to discuss the policy of trade liberalization in the literature. Adam Smith argued that the policy was good for economic development of any country. In the argument of Adam Smith, it would be safe to allow the economy to be propelled by an "invisible hand", which refers to the forces of competition motivated by individual self-interest. His argument was predicated on the role which division of labour plays in economic progress; and Adam Smith, further, argues that expansion of international trade is an important method of widening the market and of promoting the division of labour (*cf* Smith, 1776 and 1976; and Ucak, 2015).

Restrictions on international trade tend to limit the size of the market. Adam Smith (1776 and 1976) also opined that trade restrictions diminish the scope of international specialization and, thus, lower domestic productivity. In his easy on international trade, Adam Smith wrote as following here:

> [...] between whatever places foreign trade is carried on, they all of them derive two distinct benefits from it. It carries the surplus part of the produce of their land and labour for which there is no demand among them, and brings back in return something else for which there is a demand. It gives value to their superfluities, by exchanging them for something else, which may satisfy part of their wants and increase their enjoyments.
>
> By means of it, the narrowness of the home market does not hinder the division of labour in any particular branch of art or manufacture from being carried to the highest perfection. By opening a more extensive market for whatever part of the produce of their labour may exceed the home consumption, it encourages them to improve its productive powers and to augment its annual produce to the utmost, and thereby to increase the real revenue of wealth and society (Smith, 1776 and 1976).

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In the 19th century, Adam Smith developed productivity doctrine of the trade benefits to explain export drive argument; and he argues that classical trade theory is often associated with colonialism (Smith, 1776 and 1976). In 1817, David Ricardo propounded theory of comparative advantage basing his assumptions on perfect competition and full employment of resources. David Ricardo (1817 and 1973) opined also that countries can reap welfare gains by specializing in the production of those goods with the lowest opportunity cost and trading the surplus of production over domestic demand, provided that the international rate of exchange between commodities lies between the domestic opportunity cost ratios (*cf* Ricardo, 1817 and 1973; and Kilic, 2002).

This refers to static gains that arise from the reallocation of resources from one sector to another as increased specialization based on comparative advantage occurs. This, in turn, refers to trade-creation gains that arise within Customs Unions or Free Trade Areas as barriers to trade are removed between members. And once the tariff barriers have been removed, no further reallocation takes place and the static gains are exhausted (Thirlwall, 2000).

This, however, runs contrarily to the dynamic gains from trade, which continually shift outwards the whole production possibility frontier of countries if trade is associated with more investment and faster productivity growth based on scale economies, learning by doing, and the acquisition of new knowledge from abroad, particularly through foreign direct investment (Haberler, 1988).

The Ricardian theory focused on dynamic gains associated with modern trade theory (*cf* Helpman & Krugman, 1985; Kilic, 2002; and Soo, 2012) and "new" growth theory (*cf* Grossman & Helpman, 1991; Kurz, 1997; and Eaton & Kortum, 2012), which constitute a vital link in the causal chain between exports and growth. Historically, it has been argued that trade has been an important engine of growth for countries at different stages of development in not only by contributing to a more efficient allocation of resources within countries, but also by transmitting growth from one part of the world to another (Helpman & Krugman, 1985; Grossman & Helpman, 1991; Kurz, 1997; Kilic, 2002; Soo, 2012; and Eaton & Kortum, 2012).

However, not all countries have equal share in the growth of trade or its benefits and this depends on: the characteristics of production and demand of the goods in a country's trade; and the economic policies pursued by the domestic economy as well as the pattern of trade regime a country adopts. Since independence in Nigeria, for example, the volume of exports has grown slower than for developed countries. This is because the country still largely produces and exports primary commodities and low value-added manufactured goods with a relatively low income elasticity of demand in world markets. This has resulted in wider discrepancy in rates of growth of exports in value terms (Haberler, 1988).

This has deteriorated the terms of trade of developing countries and to some extent developed countries thereby causing each country's share of the total value of world trade to have drastically fallen. Given the predictions of trade theory and the facts, the important point to note is not so much on whether to trade, but in what to trade in developing countries in general and Nigeria in particular. There can be no dispute that there are both static and dynamic gains from trade, and that trade provides a vent for surplus production as stressed by Adam Smith (1776 and 1976). What is, however, in dispute is whether the overall gains to Nigeria could be greater if the

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pattern of trade was different from its present structure, and if the developed countries modified their policies towards the developing world.

It is important to note that while the developed world preaches free trade for developing countries, it continues to protect its own markets against exports of developing countries, mainly in agricultural products and textiles creating a double standard in the process. It has also been observed in the literature that real trade theory as advocated by Adam Smith (1776 and 1976) and David Ricardo (1817 and 1973) as well as conventional modern trade theory ignores the monetary or balance of payments consequences of trade (Smith, 1776 and 1976; and Ricardo, 1817 and 1973).

For instance, if a particular pattern of trade leads to balance of payments difficulties, which is not self-correcting through relative price (i.e. real exchange rate) movements, no meaningful gains from trade can be said to have taken place as output reduction unemployment are then likely to occur (Thirlwall, 2000). Thus, the orthodox theory in supporting a strong link between exports and growth neglected balance of payments consequences on trade. Whereas, export growth is the only component of demand that provides foreign exchange to allow other components of demand, such as investment, consumption, and government expenditure to grow faster; all the variables have an import content, which needs to be paid for in foreign exchange. The growth of export acts as a catalyst to curtail the effect of balance of payments constraint on demand and, at the same time, positively impact on growth from the supply-side (Razmi, 2013).

Following the same line of reasoning, M.A. Adebiyi (2006) identifies four key beneficial effect of international trade in developing countries. They include material means (capital goods, machinery, raw and semi-finished materials) indispensable for economic development. Also, trade acts as a vehicle for the dissemination of technological knowledge, the transmission of ideas for the importation of know-how, skills, managerial talents and entrepreneurship. In the same vein, trade is the vehicle for the international movement of capital, most especially from developed to developing countries. Lastly, free international trade is the best antimonopoly policy and the best guarantee for the maintenance of a healthy degree of free competition (*cf* Adebiyi, 2006; and Aiyedogbon & Ohwofasa, 2016).

Empirical Literature. A number of empirical studies have been conducted to examine the relationship between trade openness and economic performance in the literature. Thus, D. Dutta & N. Ahmed (2000) employ the framework of an endogenous growth model to examine the impact of trade policies on industrial growth in Pakistan. They find a unique long-run relationship between industrial growth and its determinants, which include the labour force, real exports, the import tariff collection rate, and the school enrolment ratio (Dutta & Ahmed, 2000).

Similarly, there has been revival of endogenous growth theory in the literature, which has established a theoretical framework that act as motivation for the empirical study of trade openness and economic performance. Excellent reviews of the studies in the literature can be found in N. Ahmed (1999); D. Dutta & N. Ahmed (2000); and Rosa Capolupo (2008).

A.F. Adenikinju & M. Olofin (2000) assess the effect of economic policy in the growth performance of manufacturing sector in Africa. The authors employ panel data for seventeen countries over the sample period of 1976-1993. The study finds a robust level of human capital (a proxy for primary

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and secondary school enrolment rates) that exerts positive impact on growth in manufacturing sector in Africa (Adenikinju & Olofin, 2000).

The study also finds that unit of labour cost has a negative impact on the growth performance of the manufacturing sector, while terms of trade was found to have a beneficial impact. It was also discovered by the study that trade liberalization policy (a proxy for index of openness) has an insignificant effect on growth of manufacturing. The literature is also replete with some studies that have found little empirical evidence in support of trade liberalization and industrial growth (*cf* Lucas, 1988; Ahmed, 1999; Dutta & Ahmed, 2000; and Capolupo, 2008).

In A.F. Adenikinju & L. Chete (1995), for instance, it was found that import liberalization has a negative impact on total factor productivity growth in manufacturing sector in Nigeria. This has been attributed to the fact that the products of domestic manufacturing firms are unable to compete with better established industries abroad and this have negatively affected domestic firms in Africa (Adenikinju & Chete, 1995). In supporting this view, some studies have pointed to the example of Korea and Japan, where some form of protections is allowed for rapid transformation of the industrial sector (Pack & Westphal, 1986; Dornbusch & Park, 1987; and Saxonhouse, 1993).

In studying trade liberalization and industrial performance in Nigeria, M.A. Adebiyi (2006) employed the model developed by R.E. Lucas (1988) to explore the short run dynamics around the variables namely: index of industrial production lagged one period, the degree of openness (trade liberalization), trade liberalization dummy, and real export. The study finds that there is no unique co-integration relationship between index of industrial production and its major determinants (Lucas, 1988; and Adebiyi, 2006).

The ECM (Error Correction Model) reveals that index of industrial production lagged one period, degree of openness, trade liberalization dummy variable, and real exports emerged as significant determinants of index of industrial production in Nigeria (Aiyedogbon & Ohwofasa, 2016). In Gambia, T.A. Mododou (2007) investigates the relationship between trade liberalization and economic growth. He employs time series covering 1970 to 2004; and using ECM, he finds that all the variables are positively significant, except ToT (Terms of Trade) which have a negative sign implying that the terms of trade in the Gambia are not favourable as imports outweighs exports (Mododou, 2007).

METHOD

In this model, trade liberalization is the independent variable, which is tested against economic growth (a proxy for gross domestic product) as well as index of industrial production. A number of growth models exist in the literature, in which the Lucasian model is obvious (*cf* Lucas, 1988; Mullineux & Dickinson, 1992; and Afzal *et al.*, 2009). The study, thus, adopts the R.E. Lucas (1988)'s model, which is specified as follows:

Y = f (K, L, H, TL) ... (1)
Where **Y** is economic growth and industrial growth; **K, L, H,** and **TL** represent capital and labour inputs, human capital as well as index of trade liberalization respectively (Lucas, 1988).

Based on the availability of time-series data and relevance to the industrial production function for Nigeria, three measures of trade liberalization are used in this paper, namely: EXP or Exports; ToT or Terms of Trade; and DOP or Degree of Openness (Aiyedogbon & Ohwofasa, 2016; and

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Nwinee & Olulu-Briggs, 2016).

It is expected that depreciation of the domestic currency will raise the price of tradable relative to that of non-tradable goods and as a result reallocation of resources from non-tradable to tradable sectors is then likely to occur. Consequently, exports should rise. Similarly, Degree of Openness and Terms of Trade as employed in the model is with the expectation that a country with high Degree of Openness and Terms of Trade tends to enjoy greater industrial and economic growth than the other way round (*cf* Birdsall & Hamoudi, 2002; and Mputu, 2016).

Finally, the use of DUMV (dummy Variable) captures policy and structural changes. It takes the value of one in the period of structural adjustment and zero in other periods. Consequently, equation (1) becomes:

$$\mathbf{IIP = f\ (ToT,\ EXP,\ DOP,\ DUM)\ \ldots\ (2)}$$

In log stochastic term, equation (2) is splinted into two models as follows:

$$\mathbf{LIIP_t = \alpha_0 + \alpha_1 LTOT_t + \alpha 2 LEXP_t + \alpha_3 LDOP_t + \alpha_4 DUM + U_t\ \ldots\ (3)}$$

Similarly, the growth equation is specified in log linear form, thus:

$$\mathbf{LGDP_t = \beta_0 + \beta_1 LTOT_t + \beta_2 LEXP_t + \beta_3 LDOP_t + \beta_4 DUM + V_t\ \ldots\ (4)}$$

Add notes:
IIP = Index of Industrial Production for Nigeria.
GDP = Real Gross Domestic Product.
ToT = Nigerian Terms of Trade.
DOP = Degree of Openness.
U and **V** = Error Terms
t = Time Trend.
$\mathbf{\alpha_0, \beta_0, \alpha_1 - \alpha_4, \beta_1 - \beta_4}$ = Parameters to be Estimated.

A positive relationship is expected between the independent variables and their determinants. The specification of the ECM (Error Correction Model) term is presented, thus:

$$\Delta InIIP_t = \alpha_0 + \sum_{i-1}^{n-1} \alpha 1t \Delta IIP_{t-1} + \sum_{i-1}^{n-1} \alpha 2t \Delta InTOT_{t-1} \sum_{i-1}^{n-1} \alpha 3t \Delta InEXP_{t-1} + \sum_{i-1}^{n-1} \alpha 4t \Delta InDOP_{t-1} + \sum_{i-1}^{n-1} \alpha 5t \Delta DUM_{t-1} + \lambda ECM_{t-1} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (5)$$

The short run dynamics of growth equation is model, thus:

$$\Delta InGDP_t = \beta_0 + \sum_{i-1}^{n-1} \beta 1t \Delta GDP_{t-1} + \sum_{i-1}^{n-1} \beta 2t \Delta InTOT_{t-1} \sum_{i-1}^{n-1} \beta 3t \Delta InEXP_{t-1} + \sum_{i-1}^{n-1} \beta 4t \Delta InDOP_{t-1} + \sum_{i-1}^{n-1} \beta 5t \Delta DUM_{t-1} + \lambda ECM_{t-1} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (6)$$

Where $\mathbf{ECM_{t-1}}$ = Error-Correction Term Lagged One Period.

Sources of Data. The Central Bank of Nigeria provides the main source of data through its statistical bulletin and annual report, and statement of account for various years. Another source of data is the National Bureau of Statistics. All the data are measured in millions of Naira unless otherwise stated.

Econometric Framework. Econometric test is predicated on the fact that time series usually contain unit root problem, where the data are drift apart. This has necessitated stationarity test in order to avoid spurious regression. R.F. Engle & C.W.J. Granger (1987) argued that a linear combination of two or more non-stationary series may be stationary. If such a stationary exists time series are said to be co-integrated (Engle & Granger, 1987). The series would then be called co-integrating equation and may be interpreted as a long-run equilibrium relationship between the variables (Engle & Granger, 1987; Johansen & Juselius, 1990; and MacKinnon, 1991).

The VEC (Vector Error Correction) specification restricts the long-run behavior of the endogenous variables to converge to their co-integrating relationships, while allowing a wide range of short-run dynamics. The co-integration term is known as the error correction term, since the deviation from long run equilibrium is corrected

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Table 1:
PP (Phillips-Perron) Unit Root Test

Variable	Order	PP Test Statistics	Mackinnon Critical Value
LIIP	I(I)	-3.7816**	-3.5796
LRGDP	I(I)	-33.0515*	-4.3226
LDOP	I(I)	-5.9677*	-4.4691
LRTOT	I(I)	-6.8492*	-4.4691
LREX	I(I)	-9.4905*	-4.3226

*(**) denotes significance at 1% (5%) level.
Source: Authors' Estimation Using Eview 4.0.

Table 2:
Co-Integration Test

Null	Alternative	Eigenvalue	Trace	5%	1%
r = 0	r = 1	0.92	93.81	54.6	61.2
r < = 1	r = 2	0.70	41.1	34.6	40.5
			Max-Eigenvalue		
r = 0	r =1	0.92	52.73	30.3	35.7
r < = 1	r = 2	0.70	25.38	23.8	28.8

gradually through a series of partial short-run adjustments (Johansen & Juselius, 1990; and Anderson, Hoffman & Rasche, 2002). A co-integrating equation is considered, thus:

$$x_{1,t} = \partial_1 x_{2,t} + v_t$$
$$x_{2,t} = \partial_2 x_{1,t} + v_t \quad \ldots (7)$$

While the VEC (Vector Error Correction) form is specified as:

$$\Delta x_{1,t} = x_1 (x_{2,t-1} - \partial_1 x_{1,t-1}) + \mu_{1,t}$$
$$\Delta x_{2,t} = \gamma_2 (x_{2,t-1} - \partial_1 x_{1,t-1}) + \mu_{2,t} \quad \ldots (8)$$

In Equation (8), the right-hand side variable is the error correction term. In the long run equilibrium, this term is zero. However, if x_1 and x_2 deviated from long run equilibrium in the last period, the error correction term is nonzero, and each variable adjusts to partially restore the equilibrium relationship. The coefficients x_1 and x_2 measure the speed of adjustment.

RESULTS AND DISCUSSION

PP (Phillips-Perron) Unit Root Test. Table 1 shows that the series were non-stationary at level but in their first level difference, stationary was achieved at either 1 or 5 percent level.

Co-Integration Test. Table 2 reveals that both the trace and the max-eigen statistics exceed the 5% level, which means that the series are co-integrated and long run relationship exists between IIP (Index of Industrial Production) and DOP (Degree of Openness), ToT (Terms of Trade), and REX (Real Export).

Co-Integration Regression Normalized on IIP. The formula about IIP (Index of Industrial Production) is following here:

InIIP = 1.00 + 0.14InDOP – 1.06InRTOT + 1.11InREX
(2.0) (-26.7) (18.5)
Log likelihood -4.71

The above results show that DOP (Degree of Openness), RToT (Real Terms of Trade), and REX (Real Export) are statistically significant in explaining IIP (Index of Industrial Production) in Nigeria within the period under review. However, while DOP and REX have a positive relationship with IIP, the impact of RToT on IIP is negative.

This is not surprising since terms

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Table 3:
Co-Integration Test on Growth

Null	Alternative	Eigenvalue	Trace	5%	1%
r = 0	r = 1	0.75	71.84	54.6	61.2
r < = 1	r = 2	0.67	42.96	34.6	40.5
			Max-Eigenvalue		
r = 0	r =1	0.75	28.88	30.3	35.7
r < = 1	r = 2	0.67	23.38	23.8	28.8

of trade to Nigeria is in most time unfavourable. Nigeria's exports are mainly primary products and substitutes are usually available. A.F. Adenikinju & M. Olofin (2000) and M.A. Adebiyi (2006) have earlier reached a similar conclusion.

Short Run Regression Results of IIP. The formula about IIP (Index of Industrial Production) is following here:

$$\Delta InIIP = 0.33 - 1.03\Delta InIIP(-1) - 0.51\Delta InDOP - 0.46\Delta InRTOT + 0.20\Delta InREX$$
$$(-0.3) \quad (-0.5) \quad (-0.7) \quad (0.3)$$
$$2.0ECM_{t-1}$$
$$(-1.6)$$
$$R^2 = 0.38, \text{ F-Stat} = 1.8$$

The results show that all the variables are not statistically significant and they have negative relationship with IIP (Index of Industrial Production), except REX (Real Export) with a positively sign. However, the ECM (Error Correction Model) coefficient carries the expected negative sign, but is only barely significant. Although, the F-statistic is significant, the individual t-ratios are insignificant.

These results are contrary to the findings of M.A. Adebiyi (2006). Thus, openness of the foreign sector in the short run does not enhance industrial production. This may be due to the fact that foreign investors are not usually convinced of Nigerian foreign policy, because of problems ranging from political to insecurity which characterized the Nigerian investment domain as unfriendly environment (Adebiyi, 2006; and Aiyedogbon & Ohwofasa, 2016).

Co-Integration Results of Real Growth. Table 3 shows that long run relationship exist between the log values of DOP (Degree of Openness), RToT (Real Terms of Trade), REX (Real Export), and RGDP (Real Gross Domestic Product).

Long run regression normalized on RGDP (Real Gross Domestic Product) is presented below:

$$\log RGDP = 1.00 + 1.41\log DOP - 3.29\log RTOT + 3.27\log REX$$
$$(2.5) \quad (-6.5) \quad (6.7)$$
$$\text{Log likelihood} = 0.95$$

Here again, the impact of RTOT (Real Terms of Trade) is negative on real growth in Nigeria and, thus, the findings here is similar to that of index of industrial production, the only difference being the log likelihood that is insignificant (Aiyedogbon & Ohwofasa, 2016).

Short Run Regression Results of RGDP. The formula about RGDP (Real Gross Domestic Product) is following here:

$$\Delta\log RGDP = 0.06 + 0.04\Delta\log RGDP(-1) - 0.02\Delta\log DOP + 0.04\Delta\log RTOT -$$
$$(0.2) \quad (-1.1) \quad (2.4)$$
$$0.03\Delta\log REX + 0.20\Delta DUM - 0.07ECM_{t-1}$$
$$(-2.3) \quad (3.8) \quad (-4.8)$$
$$R^2 = 0.71, \text{ F-stat} = 5.7$$

The results reveal that the R^2 and F-stat are fairly robust. The impact of DOP (Degree of Openness) and REX (Real Export) on real growth is negative; but while REX is significant DOP is not. On the other hand, RTOT (Real Terms of Trade), DUMV (Dummy

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Variable), and a one year lag of RGDP (Real Gross Domestic Product) have a positive relationship with current real growth (Odili, 2015; and Aiyedogbon & Ohwofasa, 2016).

However, DOP and lag 1 of real growth were not significant in explaining economic growth in Nigeria. The negative sign of RTOT gave credence to the findings of T.A. Mododou (2007) in the Gambia. The coefficient of ECM (Error Correction Model) shows that the speed of adjustment between the long run and short run equilibrium is about 7 percent.

CONCLUSION

The paper focuses the relationship between trade liberalization and economic growth in Nigeria. It employs VECM (Vector Error Correction Model) and testing the results using the S. Johansen (1988)'s co-integration approach and stationarity tests. Two equations were employed for the study: the first, equation models index of industrial production proxied by a yearly average capacity utilization rate as a function of degree of openness, real terms of trade, and real export.

In the second, equation real gross domestic product as a function of degree of openness, real export, real terms of trade, and a dummy of trade liberalization was estimated. In both equations, the long run results reveal that term of trade in Nigeria is unfavourable on industrial performance and by implication on growth rate, while the impact of openness of the foreign sector is a positive phenomenon.

In the short run, only real export has positive impact on industrial capacity, all other variables employed for the study, including a one year lag of industrial production were negative and statistically insignificant. Similarly, the short run dynamics impact of the series on growth reveal that real terms of trade and government policy (dummy) have positive impact on growth, while real export and degree of openness negatively correlated with real growth. A DUMV (Dummy Variable) could not be included on the short run equation of industrial production probably, because of insufficient data.

In all the results, since the degree of openness is positive in most cases, except the short run dynamics on growth; and since the dummy on growth is also positive, we will, therefore, conclude that trade liberalization is beneficial to Nigeria and the policy should be encouraged for the Nigerian economy. Consequently, every known impediment to foreign trade, such as arbitrary tariffs and excessive import levies, should be discouraged.

The country should create an enabling environment for investment to thrive by providing for property rights, adequate access to credit, stable power supply, good roads, telecommunications, and security. The government should control its fiscal policy, which has over the year constituted an obstacle to private investment.

Finally, government should tackle the issue of excessive dependence on import. Over-dependence on the importation of consumer and capital goods is hurting the economy in many ways, including the continuing depreciation of the naira. Measures, which promote import compression, should be vigorously pursued.[1]

References

Adebiyi, M.A. (2006). "Trade Liberalization Policy and Industrial Growth Performance in Nigeria: An Error Correction Mechanism (ECM) Technique". Available online at: www.google.com.ng [accessed in Kaduna, Nigeria: September 19, 2017].

[1] ***Statement:*** Herewith, we have declared that this paper is our original work; so, it is not product of plagiarism and not yet to be reviewed as well as published by other scholarly journals.

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Adenikinju, A.F. & L. Chete. (1995). "Productivity, Market Structure, and Trade Policy Reforms in Nigeria". *A Research Report* presented at a workshop by AERC [African Economic Research Consortium], on June.

Adenikinju, A.F. & M. Olofin. (2000). "Economic Policy and Manufacturing Sector Performance in Africa" in *The Nigerian Journal of Economic and Social Studies,* Volume 42(1), pp.1-22.

Afzal, Muhammad *et al.* (2009). "A Dynamic Analysis of the Relationship among Human Development, Exports, and Economic Growth in Pakistan" in *The Pakistan Development Review*, Volume 48(4), Part II [Winter], pp.885-920. Available online also at: http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.857.8928&rep=rep1&type=pdf [accessed in Karu, Nigeria: November 25, 2017].

Ahmed, N. (1999). *Trade Liberalisation in Bangladesh.* Dhaka: University Press Limited.

Aiyedogbon, John O. & Bright O. Ohwofasa. (2016). "Effect of Trade Liberalization on Economic Development in Nigeria, 1980-2013" in *International Journal of Developing and Emerging Economies,* Vol.4, No.2 [February], pp.15-27. Available online also at: http://www.eajournals.org/wp-content/uploads/Effect-of-Trade-Liberalization-on-Economic-Development-in-Nigeria-1980-2013.pdf [accessed in Karu, Nigeria: November 25, 2017].

Akyuz, Yilmaz. (2005). "The WTO Negotiations on Industrial Tariffs: What is at Stake for Developing Countries?" in *Discussion Paper for Turkish Economic Association*, No.8. Available online also at: https://www.econstor.eu/bitstream/10419/83228/1/dp_2005-08.pdf [accessed in Karu, Nigeria: November 25, 2017].

Anderson, R.G., D.L. Hoffman & R.H. Rasche. (2002). "A Vector-Error Correction Forecasting Model of the US Economy" in *Journal of Macroeconomics*, 23, pp.569-598.

Birdsall, Nancy & Amar Hamoudi. (2002). "Commodity Dependence, Trade, and Growth: When 'Openness' is Not Enough" in *Center for Global Development: Working Paper Number 7*. Available online also at: https://www.cgdev.org/sites/default/files/2783_file_cgd_wp007.pdf [accessed in Karu, Nigeria: December 22, 2017].

Capolupo, Rosa. (2008). "The New Growth Theories and Their Empirics after Twenty Years" in *Economics Discussion Papers: The Open-Access, Open-Assessment E-Journal*, 27 [September]. Available online also at: http://www.economics-ejournal.org/economics/journalarticles/2009-1 [accessed in Karu, Nigeria: November 25, 2017].

Dornbusch, Rudiger & Yung Chul Park. (1987). "Korean Growth Policy" in *Brookings Papers on Economic Activity*, Volume 2. Available online also at: https://www.brookings.edu/wp-content/uploads/1987/06/1987b_bpea_dornbusch_park_collins_corbo.pdf [accessed in Karu, Nigeria: December 22, 2017].

Duncan, R. & D. Quang. (2005). *Trade Liberalization, Economic Growth, and Poverty Reduction Strategies*. Australia: Commonwealth of Australian, AusAID.

Dutta, D. & N. Ahmed. (2000). "Trade Liberalization and Industrial Growth in Pakistan: A Co-Integration Analysis". *Working Paper.* Sydney, Australia: Center for South Asian Studies.

Eaton, Jonathan & Samuel Kortum. (2012). "Putting Ricardo to Work" in *Journal of Economic Perspectives*, Volume 26(2), pp.65-90.

Ebong, Friday, Elijah Udoh & Frances Obafemi. (2014). "Globalization and the Industrial Development of Nigeria: Evidence from Time Series Analysis" in *International Review of Social Sciences and Humanities*, Vol.6, No.2, pp.12-24. Available online also at: https://pdfs.semanticscholar.org/424d/5397ca3770a739aa47ad937d4f22bfdfb093.pdf [accessed in Karu, Nigeria: November 25, 2017].

Engle, R.F. & C.W.J. Granger. (1987). "Cointegration, Error Correction: Representation, Estimation, and Testing" in *Econometrica*, 55, pp.251-76.

Grossman, G.M. & E. Helpman. (1991). "Trade, Knowledge Spillovers, and Growth" in *European Economic Review,* Volume 35(3), pp.123-145.

Haberler, G. (1988). *International Trade and Economic Development.* USA [United States of America]: International Center for Economic Growth.

Helpman, Elhanan & Paul R. Krugman. (1985). *Market Structure and Foreign Trade*. Cambridge, MA: MIT Press.

Johansen, S. (1988). "Statistical Analysis of Co-Integrating Vectors" in *Journal of Economic Dynamics and Control*, Volume 12, pp.231-54.

Johansen, S. & K. Juselius. (1990). "Maximum Likelihood Estimation and Inference on Co-Integration with Applications to the Demand for Money" in *Oxford Bulletin of Economics and Statistics*, Volume 52, pp.169-210.

Kilic, Rehim. (2002). "Absolute and Comparative Advantage: Ricardian Mode". Available online at: https://msu.edu/course/ec/340/Kilic/lecture3.pdf [accessed in Karu, Nigeria: November 25, 2017].

Kurz, Heinz D. (1997). "What Could the 'New' Growth Theory Teach Smith or Ricardo?" in *Economic Issues*, Volume 2, Part 2 [September]. Available online also at: http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.655.1348&rep=rep1&type=pdf [accessed in Karu, Nigeria: December 22, 2017].

Lucas, R.E. (1988). "On the Mechanics of

ISSN 2302-5808** and **www.journals.mindamas.com/index.php/susurgalur

Economic Development" in *Journal of Monetary Economics,* Volume 22(2), pp.211-224.
MacKinnon, J.G. (1991). "Critical Values of Cointegration Tests" in R.F. Engle & C.W.J. Granger [eds]. *Long-Run Economic Relationships.* New York: Oxford University Press.
Matin, K.M. (1992). "Openness and Economic Performance in Sub-Saharan Africa: Evidence from Time Series Cross-Country Analysis" in *Working Paper,* 1025. Washington D.C.: World Bank.
Mododou, T.A. (2007). "The Impact of Trade Liberalisation on Economic Growth in the Gambia" in *IDEP: African Institute for Economic Development and Planning.* Available online also at: www.unidep.org [accessed in Kaduna, Nigeria: September 19, 2017].
Monisola, Oluwaleye Janet. (2014). "Public Policy and Trade Liberalisation in Nigerian Economic Development" in *Research on Humanities and Social Sciences*, Vol.4, No.15. Available online also at: http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.875.8428&rep=rep1&type=pdf [accessed in Karu, Nigeria: November 25, 2017].
Mputu, Christelle Luengu. (2016). "Terms of Trade, Trade Openness, and Economic Growth in Sub-Saharan Africa" in *Culminating Projects in Economics*, Paper 3. Available online also at: http://repository.stcloudstate.edu/cgi/viewcontent.cgi?article=1001&context=econ_etds [accessed in Karu, Nigeria: November 25, 2017].
Mullineux, Andy W. & David G. Dickinson. (1992). "Equilibrium Business Cycles: Theory and Evidence" in *Journal of Economic Surveys*, Volume 6, Issue 4 [December]. Available online also at: https://onlinelibrary.wiley.com/doi/pdf/10.1111/j.1467-6419.1992.tb00156.x [accessed in Karu, Nigeria: December 22, 2017].
Nwinee, Barisua Fortune & Omiete Victoria Olulu-Briggs. (2016). "Trade Openness, Financial Development, and the Nigerian Economy" in *American International Journal of Contemporary Research*, Vol.6, No.3 [June]. Available online also at: http://www.aijcrnet.com/journals/Vol_6_No_3_June_2016/17.pdf [accessed in Karu, Nigeria: December 22, 2017].
Odili, Okwuchukwu. (2015). "Real Exchange Rate Volatility, Economic Growth and International Trade in an Emerging Market Economy: Evidence from Nigeria" in *International Journal of Academic Research in Business and Social Sciences*, 2015, Vol.5, No.7 [July]. Available online also at: http://hrmars.com/hrmars_papers/Real_Exchange_Rate_Volatility,_Economic_Growth [accessed in Karu, Nigeria: December 22, 2017].
Pack, H. & L.E. Westphal. (1986). "Industrial Strategy and Technological Change: Theory *versus* Reality" in *Journal of Development Economic,* Volume 22, pp.87-128.
Razmi, Arslan. (2013). "Correctly Analyzing the Balance of Payments Constraint on Growth" in *Economics Department Working Paper Series*, No.166. Available online also at: https://scholarworks.umass.edu/econ_workingpaper/166 [accessed in Karu, Nigeria: December 22, 2017].
Ricardo, David. (1817). "Principles of Political Economy and Taxation" in Thirlwall [ed]. *Trade, Trade Liberalization, and Economic Growth: Theory and Evidence.* Nigeria: African Development Bank, Economic Research Paper, No.63.
Ricardo, David. (1973). *The Principle of Political Economy and Taxation.* London: J.M. Dent and Sons Ltd.
Romer, P.M. (1990). "Endogenous Technological Change" in *Journal of Political Economy,* Volume 98.
Saxonhouse, Gary R. (1993). "What Does Japanese Trade Structure Tell Us about Japanese Trade Policy?" in *Journal of Economic Perspectives*, Vol.7, No.3 [Summer], pp.21-43. Available online also at: https://pubs.aeaweb.org/doi/pdfplus/10.1257/jep.7.3.21 [accessed in Karu, Nigeria: November 25, 2017].
Shafaeddin, S.M. (2005). "Trade Liberalization and Economic Reform in Developing Countries: Structural Change or De-Industrialization?" in *UNCTAD Discussion Papers,* 179. Available online also at: http://www.networkideas.org/featart/aug2005/De_Industrialization.pdf [accessed in Karu, Nigeria: November 25, 2017].
Smith, Adam. (1776). "An Inquiry into the Nature and Causes of the Wealth of Nations" in Thirlwall [ed]. *Trade, Trade Liberalization, and Economic Growth: Theory and Evidence.* Nigeria: African Development Bank, Economic Research Paper, No.63.
Smith, Adam. (1976). *An Inquiry into the Nature and Causes of the Wealth of Nations.* Chicago: University of Chicago Press.
Soo, Kwok Tong. (2012). "Intra-Industry Trade: A Krugman-Ricardo Model and Data". Available online at: http://www.lancaster.ac.uk/staff/sook/papers/KrugmanRicardo7.pdf [accessed in Karu, Nigeria: December 22, 2017].
Thirlwall, A.P. (2000). "Trade, Trade Liberalization, and Economic Growth: Theory and Evidence" in *African Development Bank: Economic Research Paper,* 63.
Ucak, Ayhan. (2015). "Adam Smith: The Inspirer of Modern Growth Theories" in *PROCEDIA: Social and Behavioral Sciences*, 195, pp.663-672. Available onlile also at: https://ac.els-cdn.com/S1877042815037374 [accessed in Karu, Nigeria: November 25, 2017].
WB [World Bank]. (1987). *World Development Report.* New York: Oxford University Press.

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