

## **Globalization and the Industrial Development of Nigeria: Evidence from Time Series Analysis**

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### **Abstract**

Among the biggest dilemmas developing countries face is whether they should open their economies up to the globalization process or adopt a cautious approach to avoid risks. There are fears that globalization would lead to environmentally damaging production and consumption patterns, high labour unemployment rates and such other fears as loss of local control over domestic economic programmes, as well as de-industrialization. In this paper, we examined the nature of the influence globalization might have exerted on the industrial development of Nigeria over the past five decades (1960-2010). Based on the Engle-Granger two-step and Johansen Cointegration tests, the vector auto regressions technique was used within an error correction framework. Findings clearly showed that globalization had significant impacts on industrial development in Nigeria. Specifically, trade openness had a positive influence on industrial development. This suggested that increasing the level of trade with the rest of the world would create opportunities to export local raw materials and import necessary inputs into the industrial process. In contrast, financial liberalization adversely impacted on industrial development. Policies were required to reverse the tide of capital flight from the country and direct resources towards developing the country's industrial sector.

**Keywords:** Globalization, industrial development, co-integration, vector auto regressions, error correction framework.

## 1. Introduction

Industrialization is regarded as a veritable channel of attaining the lofty and desirable national goals of improved quality of life for the citizenry. Governments, especially in developing countries, see industrialization as a way of transforming their economies (Ayodele and Falokun 2003). They seek to use industrialization as a weapon for increasing their national output, minimizing unevenness in development outcomes, generating funds for the government, minimizing their dependency on the developed countries, and in some cases, minimizing fluctuations in foreign exchange earnings. These and other objectives contain elements of conflict and the necessary trade off are not usually logically effected. While desiring to use industrialization to tackle development generally, many governments have neglected the need to establish industries that are most suitable for their environment. For instance, many of the industries are not geared towards greater use of labour and other abundant local inputs. Thus industrialization has not assisted significantly in tackling the problem of domestic resource utilization. Yet these countries regard industrialization as a sine qua non for breaking the vicious cycle of poverty and for achieving dynamic and self-reliant economies.

In Nigeria, as in many other developing countries, the word industry is used essentially as a synonym for manufacturing. This is because manufacturing is the most dynamic component of the industrial sector. Industrialization has come to be regarded as a crucial and powerful engine in the overall development process. The World Bank has classified Nigeria as inward oriented by trade orientation. Using data for 1963 – 73 and 1973 – 1985, she was deemed moderately inward oriented for the production period 1963 – 1973, but strongly inward oriented for the period 1973 – 1985.

By any standard, Nigeria would be classified as industrially underdeveloped. Yet a lot of efforts have been put into the industrialization process. Plan after plan, investment policies have been renewed, fine-tuned and at times completely revamped. Resources are abundant and investment opportunities are almost unlimited. Various industrial development policies, perspective plans and medium-term economic plans acknowledged the importance of the manufacturing sector in the economy. For instance, as stated in the nation's 4<sup>th</sup> Plan, manufacturing is capable of sustaining a minimum growth rate of 15% per annum, contributing over 7% to gross domestic product, promoting employment and enhancing the value of natural resources, to mention but a few.

Although industrialization (with special emphasis on manufacturing) is vital in the process of economic development, its performance in Nigeria has not been quite impressive. Two main strategies have been put in place to correct this anomaly. The first is the import substitution strategy while the second is the export promotion strategy. The second strategy, which has been in vogue since the adoption of the SAP in Nigeria in mid – 1986, emphasizes the promotion of value – added non-oil exports, especially manufactures, and did not actually achieved significant results (Uniamikogbo, 1996).

Globalization is a process through which an increasing free flow of ideas, people, services, capital and culture should lead to the integration of national economies and societies across the globe. It is a call on national economies all over the world to, as a matter of deliberate policy, be open to trade, international capital movements and labour mobility. According to its protagonists, globalization is expected to boost the standard of living of the people in all participating countries through rising incomes and the transfer of sophisticated technology (as in information and biotech agriculture) from the developed to the developing economies; through promoting human freedom by spreading information that broadens their choice (Annan-Yao, 1996). Avenues to globalization undoubtedly include international trade, capital flows, advances in telecommunication and transportation, etc.

Some of the aspects of globalization expected to guide fair competition include the anticipated reduction of barriers to free trade as a result of the World Trade Organization's (WTO) agreements and the growing global technology and improved work organizations.

Nigeria is increasingly launching herself into the globalization train, expecting to address her current economic problems of unemployment, prices instability, balance of payments disequilibrium, poverty, income inequality, among others. Privatization, deregulation of key sectors of the economy, financial and trade liberalization are means of adapting to globalization in order to fit into the new global system. However, several problems may arise from regional or world agreements at the global level. For instance, the requirement of common policies and strategies on agricultural and industrial development may conflict with the interest of an individual country's competitive policy given their different levels of industrial development. Furthermore the less industrialized country may likely face much stiffer competition. Given the recent trend towards trade liberalization and globalization, it is imperative for the Nigerian government to formulate appropriate industrial and trade policies that will foster the competitiveness of basic industries, support local manufacturing industries, and make Nigeria to enjoy the emerging opportunities and compete adequately the international market without resorting to protective measures (Nemedia, 1998).

There is no doubt that the expansion of trade and the diffusion of techniques which globalization promises are necessary ingredients for the industrial development of any nation. The challenge, however, is whether developing countries can take advantage of the liberalization process while at the same time avoiding or minimizing the disruptive consequences of globalization on their societies and economies. As no nation can survive on its own, this challenge translates into these countries objectively assessing their macroeconomic strengths and weaknesses with a view to optimizing available opportunities, despite these threats.

For these countries a number of questions, therefore, beg for answers in this search for a sanguine relationship between industrialization and globalization. Among these are, given her industrial landscape:

- what should Nigeria realistically expect from globalization;
- what are the important channels of industrialization and globalization; and
- how should these channels be harmonized for optimum benefits?

In this paper we take the industrial sector as a whole, treat globalization as largely an economic phenomenon and attempt to show how it has affected industrial development in Nigeria. We identify the major measures or indices of globalization that have greater implications for the development of the country's manufacturing and, consequently, industrial sector. To that extent, this paper examines the link between globalization and industrialization in Nigeria by exploring the explanatory and predictive powers of major national and international macroeconomic variables in the industrialization-globalization nexus.

The paper is organized into six sections. Following these introductory remarks is a section on the review of the literature. In the third section is the theoretical framework. This is followed by the research methodology and the empirical lessons based on the Nigerian experience in sections four and five, respectively. The paper ends in section six with concluding remarks.

## **2. Literature Review**

Globalization is a phenomenon that has attracted considerable research, both theoretical and empirical. The concept has both economic and social dimensions. In this paper, the focus is on its economic dimension. Economic globalization is the increasing openness of the national

economy to international trade, investment borrowing and lending, migration, aid economic policies, communication and other form of cooperation (Onah, 2002). It entails the globalization of production, markets, technology and industries (Joshi, 2009). Globalization leads to an increase in the growth rate of developing countries both directly and indirectly. Directly, it affects the determinants of economic growth such as transfer of technology, from developed to developing countries; reduction in the cost of capital as well as the development of agricultural exports. Indirectly, it increases production due to better risk management as well as improvement in macroeconomic policies and the competitive pressure.

However, globalization has both positive and negative consequences on the growth of developing countries. UNCTAD (1996) succinctly summarizes the opportunities and challenges of globalization in its report to the 9<sup>th</sup> session of the conference to include:

- Trading opportunities arising from the urgency round;
- Opportunities from international capital flows and financing of department;
- Opportunities provided by international production through FDI; and
- Increased opportunities for economic co-operation among developing countries to boost south-south cooperation.

The report also identifies a number of potential negative consequences and challenges associated with globalization to include:

- Loss of policy autonomy by developing countries arising from economic liberalization policies and stringent multinational discipline;
- Financial openness and the risk of instability and disruption due to the development sentiments of external investors; and
- The marginalization of developing countries by the developed ones, especially LDCs who are unable to meaningfully participate in globalization due to supply – side weaknesses and debt.

Empirical studies on the imperatives of globalization on the economy are numerous. Employing time series data from 1970-2000, Ndiyo and Ebong (2003) examined the challenges of openness in developing countries for lessons to be drawn using Nigeria. The methodology adopted for this study was the Vector Autoregressive (VAR) technique. Empirical result from this study shows that globalization has had both positive and negative effect on the Nigerian economy; but with the negative effect being more dominant. According to the study, the predominance of the negative effect was because the country was not yet ready for full-scale globalization.

However, Oyefusi and Udoh (2004) in their analysis of openness, trade Liberalization and economic growth in developing countries came to the conclusion that openness to trade is a necessary path a developing country must tread if it is to attain sustainable growth and development. The study however argued that the ability of a nation to benefit from trade liberalization is largely dependent on appropriate domestic policies, adequate human capital, the capacity for strategic government intervention, and proper harnessing of the socio-economic-cum political factors supportive of growth. From this conclusion, it may rightly be inferred that the lack of positive impact of globalization on Nigeria is due largely to the failure of the country to possess these preconditions.

Alimi and Atanda (2011) investigate the effect of globalization on economic growth in Nigeria between 1970 and 2010 allowing for cyclical fluctuations in foreign investments. The autoregressive models employed for this paper revealed that in Nigeria, trade integration - a proxy of globalization - has significant positive effect on real output growth - a measure of economic growth. This indicates that globalization leads to a rise in trade, increases living

standards, investment and more capital flows as well as facilitates technology transfer to some extent. It has also led to increase in inequality and poverty levels which have deteriorated the level of development.

In a similar study, Kareem, Bakare and Ologunla (2013) investigated the nexus between globalization and economic growth in Nigeria from 1970-2008. This study employed descriptive statistics, regression technique and correlation analysis in evaluating the relevant results. The result of the regression analysis shows that trade openness has positive and significant relationship with economic growth in Nigeria.

Studies on the relationship between globalization and industrial sector performance also abound in Nigeria. In their study, Aluko, Akinola and Fatokun (2004) examined the impact of globalization on the Nigerian manufacturing sector with particular reference to textile firms selected from Lagos, Asaba and Kano. This study employed both qualitative and quantitative techniques in the collection of the relevant data while parametric and non-parametric methods were adopted in the data analysis. The study utilized a sample of 630 respondents. Result from this study shows that globalization has had an inverse effect on the manufacturing sector. In particular, the result shows that globalization has strong adverse effects on capacity utilization in the manufacturing sector. The study then concludes that Nigeria and her manufacturing firms are not fully prepared for the challenges of globalization.

Zainawa (2006) examined the impact of globalization on Nigerian industries, focusing attention on the footwear industry in Kano State for the period covering 1980 to 2004. Descriptive methods were mainly used in analyzing the data. Finding from this study shows that globalization has a serious negative impact on footwear industry in Kano State. In specific terms, the results showed that the phenomenon of globalization has led to industrial closures, production capacity underutilization, unemployment, stagnation, industrial backwardness, and over dependence on imported leather footwear products from industrialized economies.

Anugwom (2007) investigated the influence of globalization on labour utilization in Nigeria's construction industry between August and November, 2000. For this purpose, a random sample of 45 respondents was interviewed. The results of the interview as reported by this study show that the process of globalization has greatly changed the manner of labour utilization in terms of nature of employment, poor earnings, global control of the economy, and de-unionization of workers. The study concludes that outcomes from globalization have been unfavorable to labour in the construction industry, particularly workers in the semi-skilled category.

Employing time series data for the period from 1990-2006, Ogunrinola and Osabuohien (2010) examine the impact of globalization on employment generation in Nigeria's manufacturing sector. The study adopted the ordinary least squares (OLS) method together with various diagnostic tests. Findings from this study showed that globalization has a positive impact on employment level in the manufacturing sector of Nigeria.

Tamuno and Edoumiekumo (2012) examine the impact of globalization on the Nigerian industrial sector, utilizing annual time series data covering the period 1970-2008. This study adopted time series analysis under the framework of cointegration test and error correction mechanism. Cointegration test result showed existence of long run relationship among the variables in the model. The result of the error correction model for short run dynamics showed that external debt, gross capital formation, nominal exchange rate and degree of openness have negative impact on the Nigerian industrial sector; while foreign direct investment has positive impact on industrial output in Nigeria. The study concludes that the Nigerian industrial sector has a weak base which makes it difficult to compete favourably with her foreign counterparts.

Utilizing data from 1975-2010, Essien and Mozie (2012) studied the effect of globalization on industrial performance in Nigeria, focusing mainly on plastic firms. The study period was divided into two: the pre-SAP and the post-SAP periods. The study adopted both descriptive and econometric approaches in the analysis of the relevant data. The result of the cointegration test confirmed the existence of a long run relationship among the variables. However, contrary to expectations, the results show that the process of globalization has led to de-industrialization of plastic firms in Nigeria. The manufacturing capacity of these firms remained very low, leading to closure of many of them.

From this brief review of the literature above, it is interesting to note that in spite of the sea of studies on globalization, controversy over its effect on economic growth, employment and industrial performance persists. However, the use of FDI, nominal exchange rate and degree of openness as proxies for globalization is gaining wider consensus. Previous studies in Nigeria, except the study by Tamuno and Edoumiekumo (2012), were all case studies of globalization on the performance of selected industrial firms, with no consideration of the industrial sector as an aggregate. The present study is an attempt to fill this gap.

### **3. Theoretical Framework**

We treat Nigeria as a newly industrializing country. To that extent, the Gerschenkron theory of economic deprivation is pertinent. This theory argues that industrial growth emanates from the context of economic deprivation. According to this position, a number of benefits accrue to industrial latecomers that may engender a rapid leap out of backwardness into sustained economic growth. This is partly based on the observation that some industrial latecomers (of the 18<sup>th</sup> and 19<sup>th</sup> centuries) had the tendency to grow at a faster rate than their predecessors: rapid industrial growth in Japan at the turn of the century and that in Taiwan in the 1960s and 1970s readily come to mind.

The deprived economy model is concerned with the beginning of industrial growth and is predicated on underdevelopment as the starting point. It predicts that as more endowed countries advance and backwardness deepens, the underprivileged society will become increasingly sensitive to the contrast. As social tension increases a vast effort is made to bridge the gap and a desire for the benefits of industrial growth is born. Such growth is deemed possible as backwardness conveys a number of advantages on backward nations. The more backward a national economy, the more sophisticated will be the industrial equipment, technology and plant it can select for its manufacturing development. It will be able to import the most modern machines with the concomitant advantage of enjoying the most significant economies of scale currently available.

Gerschenkron's theory has a distinct advantage in that it recognizes the position of the present less developed countries (LDCs) in relation to the world market. Their position is fundamentally different from that of the advanced countries on the eve of their industrialization. However, the twin problems as to where the foreign exchange for financing this will come from and how to solve the balance of payments problems that may ensue need to be addressed given that the major exports of these countries are primary productions. Herein lays the link between industrialization and globalization.

### **4. Research Methodology**

#### **4.1 The Empirical Model**

There are many dimensions to economic globalization. However, for the purpose of this paper, two are very relevant. One is trade globalization, the other is financial globalization. Trade globalization (TG) – perhaps the most basic index for this is the one that measures the

extent of globalization as the volume of trade (i.e. flow of goods and services) between countries. This is measured as the ratio of a country's total trade to its GDP. Thus  $TG = [\text{exports}(X) + \text{imports}(M)]/GDP$ . This measure is popularly referred to as Openness. On the other hand, financial globalization (FG), another important dimension of globalization, is seen as flows of capital. It is measured as  $FG = NFDI/GDP$ . Where NFDI = Net Foreign Direct Investment; and GDP as earlier defined. Theoretically, capital is expected to flow from countries where it is abundant to countries where it is scarce.

The major economic channels through which globalization affects the industrial development of a given nation include:

### **i. Openness (OPNSS)**

The share of imports and exports in overall output provides a ready measure of extent of globalization of the goods market. Openness to trade enhances an economy's growth rate since it provides access to a variety of imported inputs, especially technology in addition to expanding the market for domestic exports to innovation and specialization. However, the new growth literature is not clear about how increased openness affects the growth rate of an economy. The direction of impact of openness on growth, therefore, remains an empirical issue. The positive a priori sign assumed for this variable in this study is therefore due to the theory that openness encourages specialization in the production and marketing of certain goods based on comparative advantages.

### **ii. Foreign Direct Investment (FDI)**

Flow of capital – debts, portfolio equity, and direct and real estate investment - between one country and others are recorded in the current accounts in the balance of payments. Globalization has brought with it an enhanced portfolio of capital flows in the forms of FDIs, bonds and equity. In particular, FDIs include transfer of technology, upgrading of domestic human capital through management capacity building and enhanced access to industrial countries market for their emerging manufacturing industries. FDIs also promote local productivity through linkages to services suppliers and the labour force as well as by serving as models of working practices and managerial techniques. Under globalization, FDI is given a free rein. Classical economists argue that international capital mobility allows countries with limited savings to attract financing for productive domestic investment projects. It enables investors to diversify their portfolios, spread investment risks more broadly and promote inter-temporal trade. In turn, higher rates of return can encourage saving and investment that deliver faster economic growth. There should therefore be a positive relationship between FDI and industrial development.

### **iii. Foreign Exchange Rate (FOREX)**

The strength of a country's currency depends on a number of factors. These include the state of the economy in terms of its competitiveness and volume of its exports, the level of domestic production, and the quantum of foreign reserves (CBN, 1999). Where the importation of essential goods and services becomes costly, as a result of increase in prices of domestic goods there is a reduction in the purchasing power of the domestic currency – a depreciation of the domestic currency. Therefore, a globalization process that leads to high naira exchange rate can further increase distress in the economy – a sense in which industrial growth and exchange rate are said to be inversely related (Caramazza and Aziz, 1998).

#### iv. Average World Prices (AWP)

Inflation is an economic phenomenon that shows in a persistent rise in the general price level. Continuously rising prices are another cause of economic depression. When prices rise, the purchasing power of money falls. It is a problem that has often proved difficult to tackle largely because any purposeful attempt at curbing it would lead to a trade-off among other important macro-economic and social objectives such as employment, social safety nets, crime and economic growth (Jhingan, 2000). Inflationary pressures are also indicated in an excessive drain of the country's foreign exchange reserves as imports then become cheaper. A globalizing economy is open to the vagaries of world prices over which it has no control. Therefore, a negative relationship is expected between industrial growth and the world price level.

#### v. Financial Development (FINDEV)

With financial integration comes higher capital mobility and increased risk sweeping. The consequence of this is that there will be an increase in the supply of risk capital. This will in turn cause a higher rate of industrial development. Access to finance at reasonable cost can be important for industrial development by simply making it easier and less costly for firms to finance working capital needs and investments in upgrading technology and new innovative activities. In LDCs, financial market imperfections can be particularly important in firm's ability to import. In an environment with financial market imperfection and credit constraints, firms cannot borrow more than a multiple of their current profits. Access to finance, defined as financial depth, is measured as the ratio of liquid liabilities to Gross Domestic Product ( $M_2/GDP$ ). The state of the financial market should therefore directly determine the state of industrial development in a country.

### 4.2 Data and Method of Analysis

Annual time series data covering 1970-2010 have been used. The basic data for this analysis are GDP, exports, imports, foreign domestic investment, external reserves, foreign exchange rate, and average world prices. These data were collected from three main sources: International Financial Statistic Year Book – a publication of the IMF; Statistical Abstract – a publication of Nigeria's Federal Bureau of Statistics and the Statistical Bulletin – a publication of the Central Bank of Nigeria.

### 4.3 Model Formulation

The EG two step error correction models are specified below:

$$\Delta \ln indy_t = \alpha_0 + \alpha_1 \Delta \ln opnss_t + a_2 ecm_{1t-1} + \varepsilon_{1t} \quad (1)$$

$$\Delta \ln indy_t = b_0 + b_1 \Delta \ln fdi_t + b_2 ecm_{2t-1} + \varepsilon_{2t} \quad (2)$$

$$\Delta \ln indy_t = c_0 + c_1 \Delta \ln exr_t + c_2 ecm_{3t-1} + \varepsilon_{3t} \quad (3)$$

$$\Delta \ln indy_t = d_0 + d_1 \Delta \ln findep_t + d_2 ecm_{4t-1} + \varepsilon_{4t} \quad (4)$$

$$\Delta \ln indy_t = e_0 + e_1 \Delta \ln findep2_t + e_2 ecm_{5t-1} + \varepsilon_{5t} \quad (5)$$

$$\Delta \ln indy_t = f_0 + f_1 \Delta \ln wpi_t + f_2 ecm_{6t-1} + \varepsilon_{6t} \quad (6)$$

Where  $\Delta$  denotes the first difference operation on the respective variables;  $a_1$ ,  $b_1$ ,  $c_1$ ,  $d_1$ ,  $e_1$  and  $f_1$  are the coefficients showing the short run equilibrium relationship connecting the independent and the dependent variable;  $a_2$ ,  $b_2$ ,  $c_2$ ,  $d_2$ ,  $e_2$ , and  $f_2$  are the coefficient showing the

long run relationship connecting the explanatory variables and the dependent variable. A negative sign tending towards 0 indicates a slow rate of adjustment to equilibrium while extremely small values, less than -2 indicate overshooting of an economic equilibrium. Lastly, positive values would indicate the system diverges from the long run equilibrium path. The  $ecm_{t-1}$ , is the residual obtained from the linear regression of the I(1) variables and lagged by one. Lastly,  $\varepsilon_{it}$  (i from 1 to 6) are the disturbance terms for the respective equations of the model.

#### 4.4 Model Estimation Procedure

There is a general tendency for time series data to contain a unit root. Consequently, an attempt has been made to test the stationarity of the data prior to specification and estimation. Moreover, when the residuals of non-stationary time series are correlated with their own lagged values a standard assumption of ordinary least squares (OLS) theory, that the disturbances are not correlated with each other, is violated. Hence, OLS estimates of such series are biased and inconsistent, and standard errors computed with such random walk variables are generally underestimates. In that case, OLS is no longer efficient among linear estimators (Ndiyo, 2003). We have therefore adopted the VAR technique within an error correction framework. Specifically, the Engle and Granger (1987) two-step procedure was adopted in this study. This procedure can be explained in two steps. First, after ascertaining the order of integration of the variables, the long run relationship between the variables is estimated and the residuals obtained. The residuals are also tested for order of integration. If the residual is stationary, it follows that there is cointegration and vice-versa. In the second step, the error correction model (ECM) is formulated and estimated. However, the Engle-Granger (EG) procedure is most suitable in the two-variable cases. For robustness, the study also adopted Johansen Cointegration test for a multivariate version of the model.

### 5. Results and Discussion

To confirm the order of integration of the variables in the model, ADF test was conducted on the variables and the results are presented in Table 1. The results show that all other variables, except openness (LNOPNSS), are integrated of order one [I(1)].

**Table 1:** ADF unit root test for Stationarity

Variable	Level	First Difference		Order of Integration
	ADF statistic	ADF statistic	Critical Value (5%)	Order of Integration
Lnindy	-2.2119	-7.6197	-3.5043	I(1)
Lnopnss	-4.0083	-10.2509	-3.5043	I(0)
Lnexr	-1.8463	-5.6552	-3.5043	I(1)
Lnfdi	-1.6353	-10.2224	-3.5043	I(1)
Lnfindep	-2.0930	-6.9728	-3.5043	I(1)
Lnfindep2	-2.1598	-6.2277	-3.5043	I(1)
Lnwpi	-0.7722	-3.2327	-3.5063	I(1)*

\*Significant at 10%

Simple linear regressions were estimated connecting the independent variables to their respective dependent variable, and their residuals obtained. Thereafter, these residuals were tested for unit root using the ADF statistics. The results of the tests are reported in Table 2. The results showed that the variables were all cointegrated at 5 percent level of significance.

**Table 2:** Residual ADF Test for Stationarity

Variable	ADF statistic	Critical value
ecm1	-3.0733	-2.9224
ecm2	-2.4072	-1.9475
ecm3	-2.6919	-1.9475
ecm4	-2.7005	-1.9475
ecm5	-2.5117	-1.9475
ecm6	-2.6733	-1.9475

Following the EG representation theorem, error correction models were then estimated. The results are presented in Table 4 as equations 1 to 6, respectively. The estimated equations yield interesting results in support of the relationship between industrial development and globalization. The various measures of globalization, except financial liberalization, positively impacted on industrial development both in the short and long terms. From equation 1, trade openness has a positive short run impact on industrial growth at 5 per cent significance level. Its long run component was also significant. This implies that increasing the level of trade liberalization would be beneficial to industrial growth both in the short run and long term.

From equation 2, it was found that foreign direct investment has a positive and significant impact on industrial growth both in the short run and long run. Similar result was obtained for world price level, using US CPI as a proxy, in equation 6. The positive and significant relationship between world price level and industrial output growth in Nigeria implies that an increase in the world price level would stimulate industrial production in Nigeria.

In equation 3, it was found that foreign exchange rate liberalization does not have a significant effect on industrial production in the short run. However, a positive long-run relationship exists between the exchange rate and industrial production as demonstrated by the significant coefficient of the error correction mechanism (ecm). From equations 4 and 5, it was found that financial development negatively impacts on industrial production. The two measures of financial development, namely,  $m_2$  (i.e., money supply/GDP) and credit to the private sector/GDP, had negative but significant relationship with industrial output growth. The implications of these results are obvious; increasing financial liberalization would be detrimental to industrial production. This is contrary to expectation, as reducing financial market imperfection through financial liberalization is supposed to increase the flow of financial resources to all sectors including the industrial sector, thereby leading to greater industrial production.

Overall, the models were significant. All the estimated models have F-statistics which were significant at the 5 percent level of significance. There was also no sign of serious serial correlation in any of the models. Durbin Watson statistics were all within the acceptance region of 1.75 to 2.25. However, to capture the interaction between the independent variables it was necessary to estimate a multivariate model. To this end, the Johansen cointegration test was adopted. Table 3 presents the results of the Johansen Maximum likelihood cointegration test. From the results, it was found that only one cointegrating relationship exists between the variables.

**Table 3: Johansen Cointegration Test**

Series: LNINDY LNFDI LNEXR INOPNSS LNWPI LNFINDEP  
LNFINDEP2

Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.711806	142.0733	125.6154	0.0034
At most 1	0.374951	81.11136	95.75366	0.3286
At most 2	0.288410	58.08499	69.81889	0.2988
At most 3	0.283356	41.41256	47.85613	0.1759
At most 4	0.255571	25.08693	29.79707	0.1584
At most 5	0.176624	10.62519	15.49471	0.2356
At most 6	0.022246	1.102383	3.841466	0.2937

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

\* denotes rejection of the hypothesis at the 0.05 level

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

With this conclusion, the error correction model in equation 7 (table 4) was estimated. It turned out that all the globalization variables, exception of trade openness and financial liberalization, were not significant. The lesson to be learnt from this finding is that trade and financial liberalization are the key elements of globalization. However, trade liberalization exhibited positive effect on industrial production while financial liberalization exerted a negative impact.

**Table 4: Estimated Results (Dependent Variable:  $\Delta$ lnindy)**

**Method: Least Squares**

**Sample (adjusted): 1961 2010**

**Included observations: 50 after adjustments**

Coefficient	Equation						
	1	2	3	4	5	6	7
<b>Constant</b>	0.01 (1.51)	0.01 (0.69)	0.01 (1.03)	0.02** (2.21)	0.02** (2.32)	-0.05** (-2.28)	-0.001 (-0.06)
<b><math>\Delta</math>lnopnss</b>	0.56*** (5.96)						0.43*** (4.61)
<b><math>\Delta</math>lnfdi</b>		0.10** (2.04)					0.003 (0.07)
<b><math>\Delta</math>lnexr</b>			0.09 (0.97)				-0.03 (-0.34)
<b><math>\Delta</math>lnfindep</b>				-0.46*** (-3.74)			-0.39*** (-3.38)

<b><math>\Delta \ln \text{findep2}</math></b>					-0.35*** (-3.55)		
<b><math>\Delta \ln \text{wpi}</math></b>						3.98*** (3.28)	1.10 (1.36)
<b>ecm (-1)</b>	-0.14*** (-2.66)	-0.13** (-2.36)	-0.13*** (-2.57)	-0.09** (-2.07)	-0.10** (-2.09)	-0.40*** (-3.91)	-0.22** (-2.10)
<b>R-squared</b>	0.44	0.17	0.13	0.33	0.31	0.25	0.54
<b>Adj. R-squared</b>	0.41	0.13	0.09	0.31	0.28	0.22	0.47
<b>F-Statistic</b>	18.32	4.69	3.51	11.80	10.57	7.84	8.27
<b>Durbin -Watson</b>	2.08	2.00	2.06	2.10	2.13	1.74	1.72

**Note: (i) t values in parenthesis**

**(ii) \*, \*\*, \*\*\* represents 10, 5, and 1 percent level of significance, respectively.**

## 6. Conclusion

This paper examined the influence of globalization on the industrial development of Nigeria over the past five decades (1960-2010). Like many other developing countries, policy makers in Nigeria have acknowledged the fact that industrialization is an integral component of economic development. Thus, efforts have been directed at formulating and implementing policies to achieve industrial development and structural transformation of the economy from an agrarian economy to a modern industrial-based economy. Initial attempts through ISI and later through export promotion all yielded little fruits. Given the current pace of economic globalization, an examination of the impact of the various measures of globalization on industrial development of Nigeria became imperative. The findings from the error correction models have clearly shown that globalization has significant impact on industrial development. Specifically, trade openness has a positive influence on industrial development. It is likely so because increasing the level of trade with other countries of the world would create opportunities to export raw materials and import necessary inputs into the industrial process. In contrast, financial liberalization adversely impacts on industrial development. Therefore, policies are required to reverse the tide of capital flight from the country and channel resources towards the industrial sector.

It follows, therefore, that whether or not the prerequisites for industrialization are present or have been met in Nigeria and whether Nigeria's late entry into the industrial scene confers any advantages, as the theory predicts, are but a moot point. What bears to be stressed is: given the recent trend towards trade liberalization as in globalization, it is imperative for the Nigerian policy makers to formulate appropriate industrial and trade policies such as will enhance the competitiveness of her basic industries, support local manufacturing and increase nation's chances of enjoy emerging opportunities, and duly compete in the global market without depending on protective measures.

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