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## **INDUSTRIAL POLICY REFORMS: TOWARD ACHIEVING INDUSTRIALIZATION AND IMPROVED PRODUCTIVITY FOR NIGERIA**

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### ***Abstract***

*As an instrument of economic development, industrialisation provides new services to individuals and businesses, helps sustain man, breaks chain of dependency, creates employment and raises living standard. Sustained industrial growth requires good policies. So, to strengthen the industrial sector in Nigeria, the government has developed several industrial policies, plans and strategies. However, since 1980s, Nigeria's industrial sector has continued to be structurally weak and exhibit declining capacity utilization. The sector mostly has negative growth rates and contributes less to economic growth. This study therefore examined the impact of industrial policy reforms in enhancing industrialization process in Nigeria. The study used time series data from 1981 to 2016. It is anchored on endogenous growth model. Data was analyzed using statistical technique of multiple regression model and model estimation is based on econometric method of ordinary least square. Data were sourced from World Bank, Central Bank of Nigeria, etc. ADF and Johansen co-integration tests indicated that the variables were stationary and co-integrated. Granger causality tests result show that there is no Granger causality between policy reforms and industrial growth. The ECM results indicated an adjustment speed of 31.3 %. Policy reforms, institutional quality, and imports were found to insignificantly contribute to industrial growth in Nigeria. The study concludes that policy reforms are not effective to engender significant industrial growth*

*in Nigeria. It recommends that henceforth, policies should be inclusive, investment enhancing and efficiently implemented. Policies developed should also focus on enhancing contract enforcements, security and other good institutional qualities.*

**Keywords:** *Industrial policy, institutional quality, industrialization, industrial sector, Improved Productivity, Industrial Growth and Co-integration*

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## **Introduction**

As an instrument of economic development, industrialisation does not only provide new services to individuals and businesses, it helps man to sustain itself, breaks chain of dependency, creates employment and raises the living standard of the citizens. Emerging economies such as the Asian Tigers have been able to record increasing economic growth due to their high rates of industrial growth. Developed industrial sector is therefore a good channel to achieving the desired objectives and goals of improved quality of life of the populace (Anwana, 2016a; Adeoye, 2005). As noted by Opaluwa, Umeh and Ameh (2010), this sector plays key roles in modern economies and has motivating incentives that are crucial for economic transformation.

Since attaining political and economic independence, the Nigerian state has developed numerous policies and programmes to facilitate industrialisation process and transform her economy from monolithic, import dependent, wasteful and stunted growth economy, to an economy that is dynamic, efficient and export oriented. Nonetheless, even with numerous policies and programmes to facilitate industrialisation process, the performance of the industrial sector remains undesirable (Adeoye, 2005). Central Bank of Nigeria reports show that between 1980 and 2015, Nigeria has recorded 15 years of negative industrial growth rates, 16 years of single digit and very low but positive industrial growth rates and only 4 years of double digits positive growth rates with the highest rate of 23.01 in 1990 (CBN, 2008; 2014; Anwana, 2016a). These indicate that industrialization efforts in Nigeria are ineffective and inefficient.

Sustained industrial growth is a product of sound and inclusive policies by the government. Such policies are part of institutional quality in an economy. Inclusive policies necessitate increased private investments and total factor productivity. This heightened total factor productivity induces economic competitiveness, technical innovation and factor accumulation which in turn are

necessary for sustained economic growth. The sustained growth in turn promotes good institutions (Rodrik, 2000; Mijiyawa, 2008), and a study by Chong and Calderon (2000) indicates that there exist bidirectional causal relationship between good institutional qualities and economic growth. Therefore, quality of policies/institutions affects industrial growth of a country. Generally, institutions affect directly and indirectly any or all the sectors of an economy (Anwana, 2016b). As asserted by Adebisi and Babatope-Obasa (2004), good “institutions attract productive investments from both within and outside a country, promote ethical values, which promote good conduct and stability in business”. Likewise, weak and inefficient institutions, characterised by poor governance and policy, biased legal system, poor educational structures and outputs, inefficient and corrupt economic institutions, and high level of insecurity negatively affect industrial and economic growth as well as development of a nation.

However, institutional qualities in Nigeria are weak, for instance overall index of Economic Freedom from Heritage Foundation indicates that out of a maximum point of 100, average value for Nigeria between 1996 and 2016 was 52.86 points with a minimum of 47.3 points in 1995 and a maximum of 57.5 points in 2016. Equally, World Bank governance indicators show that between the same periods, average indices of government effectiveness, rule of law, regulatory quality, voice and accountability, and political stability were all negative (The Global Economy.com, 2017). Transparency International (2016) also indicates that from 2014 to 2016 the country is ranked 136 and scores between 26 and 28 points. These weak qualities create uncertainties which are inimical to investments, business growth, contract enforcement and property rights (Oromareghake, 2013). Informal institutions which constitute more than 90 percent of Nigeria’s businesses are poorly organised, keeps no records of business, and do not pay taxes. They contribute less than 10% to the GDP. Further, they are beset with dishonesty among operators, low managerial skills and lack of access to modern technology (Gbandi & Amisah, 2014).

Institutional qualities include governance, contract enforcement, corruption, property rights, legal and security system, etc. Policies are those rules set by public authorities as the preferred course of action toward a desired outcome. All these and many more may help to define the industrial growth status of a country (Anwana, 2016a). This study is therefore intended to examine the

impact of industrial policy reforms in enhancing industrialization process in Nigeria.

### **Nigeria industrial sector and policy reforms**

Chete, Adeoti, Adeyinka and Ogundele (2013) show that Nigeria's industrial sector "comprising manufacturing, mining, and utilities accounts for a tiny proportion of economic activity (six per cent), while the manufacturing sector contributed only four per cent to GDP in 2011". This is despite mouth-watering policies made to salvage the situation over the last 50 years, and in particular, more recent attempts to facilitate industrialization process. Adeoye (2005) confirms that industrial sector in Nigeria is structurally weak. He notes that "there were few manufacturing activities before independence in 1960. The inflow of foreign exchange occasioned by agricultural exports and later, by oil exports provided sufficient savings, and hence, funds for investment in this sector. This occasioned an annual average growth rate of over 10 per cent between 1970 and 1985".

Ubi and Effiom (2013) reports that "the performance of manufacturing sector fell by an average rate of about 1.5 per cent per annum from 1980 to 1984. Average annual growth in manufacturing output fell from 13.8 per cent between 1985 and 1989 to -0.99 per cent and -0.15 per cent for the periods 1990 to 1994 and 1995 to 1998 respectively". Also that by "2001, due to stable macroeconomic policies, the sub-sector had a positive growth rate of 3.0 per cent which later reduced to 2.8 per cent in 2002". They further alert that "it is apparently clear from the various indices that average capacity utilization fell from 70.1 per cent in 1980 to 43.8 per cent in 1989. The capacity utilization of the manufacturing industry further dwindled in the 1990s and ranged between 29.3 per cent and 42.0 per cent, while 36.1 per cent was recorded in 2000". "On the whole, industrial capacity utilization is low" (Afangideh & Obiora, 2004). As indicated in table 1, between 2000 and 2015, industrial growth rates for Nigeria has been negative for 2002, 2006, 2007, 2008, 2010, 2013 and 2015 while the highest growth rate of 21.31 was recorded in 2003.

To strengthen the industrial sector of Nigeria, the government has developed several policies and plans, though without much success. These policies and plans from 1980 are:

- The fourth national development plan (1981-85): this was meant to bring succour and see the country out of economic logjam created by worldwide

economic recession of that time. The recession brought with it such problems as: declining foreign exchange earnings, balance of payment disequilibrium and unemployment in the Nigerian economy.

- Structural adjustment programme (SAP): in 1986, emphasized enhancing investment, stimulating non-oil exports and promoting private sector-led development.
- A national science and technology (S&T) policy of 1986: this policy was launched to create more education to the public on science and technology and the role it can play to enhance national development of the economy.
- Trade and financial liberalization policy of 1989: the policy was enacted to provide a formidable competitive ground for domestic firms to succeed. It was therefore meant to stimulate efficiency in the key sectors of the economy.
- The national economic reconstruction fund (NERFUND): was set up in 1989 to complement existing industrial policies. And to open up the economy to foreign investors.
- In 1990, the need to link the science, engineering and technology sectors to fit within industrial and economic development endeavours became a key issue among the science and technology communities in Nigeria.
- The Bank of Industry (BOI) was established in the year 2000, this was to institute a professional organization that will help provide long term funds and technical infrastructure to accelerate industrial development in the country.
- National Economic empowerment and development strategy (NEEDS) was launched in 2004 and the private sector was identified as the engine of growth.
- The seven point agenda (SPA) was introduced in 2007. This was to serve as a follow up to NEEDS. It was meant to augment NEEDS and then foster further economic achievements not achievable with NEEDS. SPA was envisaged to make Nigeria one of the 20 largest economies by the year 2020 through Nigeria Vision 20: 2020.
- The Nigeria industrial revolution plan (NIRP): launched in 2014 as the national roadmap for real industrialization, with an inherent belief that it will build up Nigeria's competitive advantage, expand the scope of industry, and quicken the pace of expansion of the manufacturing sector.

- The Economic Recovery and Growth Plan (ERGP): a Medium Term Plan for 2017 – 2020 published in February, 2017. The plan builds on the Strategic Implementation Plan (SIP) of 2016. It is meant to achieve three broad strategic objectives of: (1) restoring growth, (2) investing in the people, and (3) building a globally competitive economy. It is driven by the following principles: focus on tackling constraints to growth; leveraging the power of the private sector; promoting national cohesion and social inclusion; allowing markets to function; and upholding core values.

Table 1: Industrial and manufacturing output for Nigeria

Year	Industrial output (₦)	Annual industrial growth rate (%)	Manufacturing output (₦)	Annual manufacturing growth rate (%)
1980	10,922.90	0.54	3,485.90	34.12
1981	89,072.80	715.47	13,837.90	296.97
1982	83,206.50	-6.59	15,633.50	12.98
1983	71,967.80	-13.51	10,797.40	-30.93
1984	77,888.80	8.23	9,532.80	-11.71
1985	85,097.40	9.25	12,032.40	26.22
1986	82,860.90	-2.63	11,582.60	-3.74
1987	81,596.50	-1.53	12,041.60	3.96
1988	85,146.60	4.35	13,713.90	13.89
1989	93,971.60	10.36	14,011.50	2.17
1990	115,591.40	23.01	14,702.40	4.93
1991	108,081.00	-6.50	16,078.50	9.36
1992	109,682.60	1.48	15,357.20	-4.49
1993	109,344.20	-0.31	14,788.10	-3.71
1994	106,747.60	-2.37	14,591.40	-1.33
1995	108,162.70	1.33	13,836.10	-5.18
1996	114,992.20	6.31	13,593.40	-1.75
1997	116,576.90	1.38	14,010.00	3.06
1998	117,870.30	1.11	13,046.30	-6.88
1999	110,558.60	-6.20	13,494.60	3.44
2000	121,756.60	10.13	13,958.80	3.44

<b>2001</b>	128,418.60	5.47	14,935.10	6.99
<b>2002</b>	123,553.50	-3.79	16,439.40	10.07
<b>2003</b>	149,878.70	21.31	17,369.60	5.66
<b>2004</b>	156,486.80	4.41	19,436.80	11.90
<b>2005</b>	159,161.40	1.71	21,305.10	9.62
<b>2006</b>	155,165.50	-2.51	23,305.90	9.39
<b>2007</b>	151,699.10	-2.23	25,535.50	9.57
<b>2008</b>	148,390.70	-2.18	27,905.00	9.28
<b>2009</b>	149,490.00	0.74	29,990.00	7.47
<b>2010</b>	120,332.00	-19.51	35,786.40	19.33
<b>2011</b>	128,742.50	6.99	42,161.90	17.82
<b>2012</b>	130,280.50	1.19	47,836.60	13.46
<b>2013</b>	130,145.10	-0.10	58,263.60	21.79
<b>2014</b>	137,912.50	5.63	66,842.20	12.83
<b>2015</b>	133,191.30	-3.54	65,866.20	-1.48

**Source:** CBN Annual Reports and CBN Statistical Bulletins for various years; Annual Growth Rates computed by the Author (2016)

### Literature Review

Zuvekas (1979) define industrialization as “a process of transforming raw materials with the aid of human resources and capital goods into consumer goods, new capital goods, which permit more consumer goods and social overhead capital, which together with human resources provide new services to both individuals” and businesses. So, the major role of industrialization is the transformation of goods/services to usable forms to enable man to sustain himself. Other roles pointed out by Coleman and Nixon (1978) are: to break the chain of dependency; create opportunities for massive employment; raise the living standards of the citizens; increase output per person; and generally enhance economic growth and development.

The role of institutions hinges on the fact that they benefit the society both directly and indirectly thereby contributing to economic growth and development. This is why good legal institutions that help to enforce property rights will enhance productive investments either from the citizens or foreigners. Also, good and well implemented policies, ethical values, norms, cultures and behaviours will help good conduct to thrive in a society, and as

well encourage good attitude and stable business environment (Adebiyi & Babatope-Obasa, 2004).

Robinson (2009) while discussing the role of industrial policy in development argue as follows: First, theoretically, there are good grounds for believing that industrial policy can play an important role in promoting development. Second, there certainly are examples where industrial policy has played this role. Third, for every such example there are others where industrial policy has been a failure and may have impeded development. Fourth, the difference between the second and third cases rests in the politics of policy. Industrial policy can be successful when those with political power to implement the policy have either themselves directly wished for industrialization to succeed, or have been forced to act in this way by the incentives generated by political institutions. These arguments imply that we need to stop thinking of normative industrial policy and instead begin to develop satisfactory positive approaches if we are ever to help poor countries to industrialize. Further, he concluded that the reason why industrial policies fail in so many African countries is the same as the reason that economic policies were generally very bad in that region – this is because policies are driven by the desire to maintain political power and this is generally inconsistent with economic growth.

To corroborate the above view, Ekpo (2014) undertook an analytical exploration of industrial policies and the performance of industrial sector in Nigeria. The findings of the study show that various industrial policies have not helped the country to attain the required level of industrialization that can produce dynamic change in the economic structure of the country. Consequently, the performance of industrial sector, especially manufacturing, have been below expectations. Of note is that the policies have a common feature of foreign inputs reliance which makes their successful implementation in Nigeria very costly. Hence, he recommended that proper conception and implementation of industrial policy and human capital development especially sciences and technical education for skill development should be given more priority if the country is to industrialize.

Mukoyama and Popov (2015) in their study analyzed the evolution of economic institutions during the process of industrialization. They particularly focused on the institutions of contract enforcement. Empirically, they revealed that during the process of industrialization, countries tend to shift their manufacturing production towards industries that require more relationship-specific



investments. Theoretically, they built a model with incomplete contracts and evolving institutions to account for this pattern. In the model, the incompleteness of contracts leads to two types of misallocations that lead to production inefficiency: unbalanced use of inputs and unbalanced production of different goods. In addition to this production inefficiency, imperfect contract enforcement leads to distortions in factor supply. Government invests in enforcement institutions in order to improve the contractual environment, and the evolution of industry composition crucially depends on how contractual environment changes over time.

Öztürk, Gultekin-Karakas and Hisarciklilar (2010), using development banks as influential institutions in Turkey, studied the roles of development banks as economic institutions in promoting industrialization in a developing country such as Turkey. Time series data were used and augmented Dickey-Fuller unit root tests were applied to test for stationarity. From the analysis, findings showed that given the prevailing global economic downturn, development banks will play pivotal roles in providing funds for industrial and social projects. Thus government policies should be directed to promoting effective and efficient financial sector if industrialisation is to be achieved.

On a study of institutional quality and electricity supply growth in a developing country, Anwana (2016b) adopted the neoclassical Solow-Swan growth model and employed the standard econometric error correction model (ECM) with ADF and Johansen cointegration tests. They found that institutional quality in Nigeria does not contribute positively to electricity supply growth and these inhibit industrial and economic growth of the country. The study recommends that to enhance institutional quality and therefore boost electricity supply in Nigeria, policies should be directed at enhancing contract enforcements and property rights, discouraging corruption, enthroning good governance, and improving the legal and security systems. It should be noted that industrial production thrives more where there is adequate and reliable power supply, something that has been out of reach in Nigeria over the years.

To evaluate the impact of macro level institutions on industrial growth, Tsai and Wang (2011) undertook a study using both secondary data and interviews between 2002 and 2011 and home grown telecommunications standard (TD-SCDMA). They examined how “institutional legacies impact on industrialization in telecommunication mobile terminal and mobile equipment manufacturing industries in China and how institutional changes encourage the

networking of TD-SCDMA supply chain to produce handset products”. The study clarified the “interaction effect between China State owned enterprises (SOE) vertical relationships and SOE network horizontal relationship, to demonstrate how institutional changes turn TD-SCDMA industrialization around”. The study concluded that “China has undergone institutional learning and adaptation, hence its prompt firm level research and development, as well as the formation of supply chain of TD-SCDMA mobile terminal industry”. Indeed this explains how powerful institutions can impact on the people’s perception and promote innovation that results to industrialization.

Omojimate (2012) examined how growth of agric industries in Nigeria is impacted by policies and institutional supports. Data for the study covered the period from 1970 to 1980 and were sourced from Central Bank of Nigeria statistical bulletins. Unit roots and co-integration tests were undertaken and fully modified ordinary least square regression technique was used. Variables used for analysis included: credit/loan to the agric sector, interest rates diffusion, institutional reforms, and deficit financing. Results indicated that the factors that accounted for changes in agric industries output were: credit to agric sector, deficit financing income (GDP) and institutional reforms. This highlights the importance of strong and effective institutional qualities and policy reforms as instruments for industrial output and growth.

In another study, Adeoye (2005) examined how Nigeria has adjusted her industrial and trade systems to achieve industrial progress considering the current globalization process. The study employed simple descriptive statistical technique such as ratios, changes in shares, percentages and growth rates to describe the Nigerian industrial trade structure precisely and comprehensively. It also used trend of trade and industrial systems in the country. From this study, it is indicative that Nigeria has not really changed its export and import structure from what was obtained during the period 1970 to 2002, except merely shifting from primary agricultural industry based exports to crude oil (primary mining industry) based exports. This is notwithstanding the numerous strategies and policies formulated to reverse the trend and encourage industrialisation in the country. The study further notes that, while reforms favoured domestic resource based industries, they did not favour manufactured exports, a result of weak and inefficient institutions. This is indicative that incentives for efficient resources allocation is needed to engender manufactured exports in order to catch up with the current globalization processes.

Though all the studies reviewed acknowledge a kind of relationship between different policy reforms, institutional factors and industrialization, for there to be positive effects, it is shown that policy reforms should be favourable to engender industrial growth and that available institutional qualities should be strong, efficient, effective and sound, otherwise its impact on industrialization will be negative.

### **Theoretical Framework**

The endogenous growth theory encompasses a class of models that goes beyond the neoclassical theory by endogenizing technological changes. While the neoclassical theory applies deductive logic to a set of assumptions about consumer behaviour and technology of production, the endogenous growth theory adds “knowledge” to make the model more useful and realistic, it internalizes technology into a model of how markets function and it holds that, unlike physical objects, knowledge and technology are characterized by increasing returns, and these increasing returns drive the process of growth (Cortright, 2001). So, the central notion behind the endogenous growth theory is increasing returns associated with knowledge or technology.

Endogenous growth theory also gives institutions some vital roles in creating necessary conditions for growth in an economy that is driven by knowledge, these institutions constitute formal and informal rules and policies which contribute either in shaping or limiting transactions, business practices, cultural attitudes, values, reputations and social constructs (Cortright, 2001). Institutions are also important because they help to allocate resources to their most efficient uses; they determine who gets profits, revenues and residual rights of control. Societies with economic institutions that facilitate and encourage factor accumulation, innovation and efficient allocation of resources will prosper (Acemoglu, Johnson & Robinson, 2005). The quality of such institutions includes good and inclusive industrial policy.

*Rodrik (2005) contends that sustained economic growth requires good institutions, good institutions reduces the cost of private investments and guarantee private investors the appropriation of a substantial portion of the returns on their investments. So, good institutions are necessary for an increase in private investment and total factor productivity (TFP). The increase in TFP induces a gain of economic competitiveness which in turn is necessary for sustained growth (Mijiyawa, 2008). Also, institutions of poor quality can*

*increase uncertainty, unpredictability, instability, corruption and transaction costs. Here, private enterprise is discouraged, especially in terms of tangible and intangible investments and economic retardation is encouraged.*

*The endogenous growth theory therefore suggests variety of factors as essential components of growth. Growth paths can be influenced by state interventions of one form or another, e.g. through good policy formulations and implementations or through creating conducive macroeconomic climate to foster deeper economic integration (Kumo, 2011). Policy intervention is thus considered necessary to influence growth in the long term. As such, they therefore promote the role of government and public policies in complementing investment in human capital formation and the encouragement of foreign private investments in knowledge-intensive industries (Meier, 2000 in Dang & Pheng, 2015).*

*Based on the above, it is evidently clear that endogenous growth model is a very useful model and an appropriate model to apply in the study of industrial policy reforms and industrial growth of a country such as Nigeria and thus, the endogenous growth model forms the theoretical background for this research.*

### **Model specifications and data**

This study covers the period from 1981 to 2016, which captures the period before and after major policy and other institutional changes in the economy, as well as changes in the industrial sector of Nigeria. Econometric approach for the study relies on time series data regression. The data for the study were sourced from Central Bank of Nigeria statistical bulletins and annual reports, World Bank development indicators, National Bureau of Statistics, etc. Data were analyzed using statistical technique of multiple regression model and model estimation is based on econometric method of ordinary least square. After testing for unit root, cointegration and Granger causality, the study estimated the error correction model (ECM) by adopting the general to specific approach to determine the parsimonious estimate and eliminate jointly insignificant variables.

The model used as the basis for this study is taken from the endogenous growth theory. The reviewed literatures provided links between industrial policies, institutional qualities and industrial growth. The model specified for this work shall be in the form developed by Arrow (1962) and simplified in the form of a production function as:  $Q_t = AK_t^\alpha L_t^{1-\alpha}$  - (1)

Where:  $Q_t$  = Output at time  $t$ ;  $A$  = Efficiency parameter;  $L_t$  = Labour stock;  $K_t$  = Capital at time  $t$ ;  $\alpha$  and  $\alpha-1$  = coefficient parameters

In the context of this study,  $Q$  (Output) is represented by industrial output (INQ). Thus, the model is:  $Q_t = INQ = AK_t^\alpha L_t^{1-\alpha}$  (2)

But  $A$ , the efficiency parameter is a function of other variables such as policy reforms, institutional quality, technology, etc. that is:  $A = f(POL, INS, TEC, C)$  (3)

Thus:  $INQ = f(POL, INS, TEC, CAP, LAB, EDU, IMP)$  (4)

Where: INQ = Industrial output in millions of Naira; POL = Policy Reforms in the industrial sector (measured by zero and one, for periods before (1980 to 2004) and after (2005 to 2016) introduction of NEEDS respectively; INS = Institutional quality measured in CIM; TEC = Technology (time variable, one year is one data point); CAP = Capital stock (gross fixed capital formation) in millions of Naira; LAB = Labour stock (total labour force) in millions of labour Force; EDU = Human capital measured in no of enrolments in secondary school; IMP = Total imports into Nigeria in Naira value of imports.

To be in an estimation form, equation (4) is reformulated to include the stochastic error term:  $INQ = a_0 + a_1POL + a_2INS + a_3TEC + a_4CAP + a_5LAB + a_6EDU + a_7IMP + \mu$  (5)

Where:  $\mu$  = Stochastic error term; and other variables are as already defined. The parameters  $a_1$  to  $a_7$  are coefficients of industrial output with respect to POL, INS, TEC, CAP, LAB, EDU and IMP. Apriori expected parameter values are:  $0 < a_1$  to  $a_7$ .

### Empirical Results

Table 2: Correlation matrix for INQ equation

	INQ	INS	TEC	CAP	LAB	EDU	IMP	POL
INQ	1.0000							
INS	0.3127	1.0000						
TEC	0.8311	0.5669	1.0000					
CAP	0.1846	0.7458	0.5917	1.0000				
LAB	0.7795	0.6278	0.9919	0.6820	1.0000			

<b>EDU</b>	0.2375	-0.2606	0.1657	-0.1392	0.1248	1.0000		
<b>IMP</b>	0.5044	0.7407	0.7712	0.7664	0.8042	-0.0308	1.0000	
<b>POL</b>	0.4915	0.8357	0.9573	0.7747	0.8059	-0.1320	0.8300	1.0000

Source: Computed by the Author (2017)

Table 3: The results of the augmented Dickey-Fuller (ADF) unit root tests

Variables	Level	1 <sup>st</sup> Difference	Remarks
<b>INQ</b>	-1.316392	-5.577012***	I(1)
<b>TEC</b>	0.493694	-4.603638***	I(1)
<b>INS</b>	-0.679324	-6.391510***	I(1)
<b>LAB</b>	-1.282069	-6.189826***	I(1)
<b>EDU</b>	-3.733089***		I(0)
<b>CAP</b>	0.881298	-4.741452***	I(1)
<b>IMP</b>	0.242478	-5.577582***	I(1)
<b>POL</b>	-0.594089	-5.744563***	I(1)

Source: Computed by the Author (2017)

Note: Test critical values (Constant): 10% = -2.6148; 5% level = -2.9527; 1% level = -3.6422

\*\*\* signify significance at one percent; \*\* signify significance at five percent; \* signify significance at ten percent

Table 4: Pairwise Granger Causality Tests

Null Hypothesis:	Obs	F-Statistic	Prob.
<b>INS does not Granger Cause INQ</b>	33	1.07615	0.3546
<b>INQ does not Granger Cause INS</b>		0.93331	0.4051
<b>POL does not Granger Cause INQ</b>	33	0.37518	0.6906
<b>INQ does not Granger Cause POL</b>		1.52991	0.2341

Source: Computed by the Author (2017)

Table 5: Cointegration test results

Hypothesized CE(s)	No. of Eigen value	Trace Statistic	0.05 Value	Critical Prob.**
<b>None *</b>	0.983164	517.9110	219.4016	0.0000
<b>At most 1 *</b>	0.975936	383.1308	179.5098	0.0000
<b>At most 2 *</b>	0.929776	260.1379	143.6691	0.0000

<b>At most 3 *</b>	0.831946	172.4880	111.7805	0.0000
<b>At most 4 *</b>	0.650132	113.6335	83.93712	0.0001
<b>At most 5 *</b>	0.546449	78.97688	60.06141	0.0006
<b>At most 6 *</b>	0.520747	52.88554	40.17493	0.0017
<b>At most 7 *</b>	0.370609	28.61320	24.27596	0.0133
<b>At most 8 *</b>	0.331992	13.33411	12.32090	0.0337
<b>At most 9</b>	0.000608	0.020075	4.129906	0.9078

Source: Computed by the Author (2017)

Trace test indicates 9 cointegrating eqn(s) at the 0.05 level; \* denotes rejection of the hypothesis at the 0.05 level; \*\*probability-values

Table 6: Lag order selection criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
<b>0</b>	-2912.997	NA	4.28e+70	182.4998	182.8205	182.6061
<b>1</b>	-2690.467	333.7952	9.00e+65	171.6542	174.2192	172.5044
<b>2</b>	-2631.952	62.17226	8.02e+65	171.0595	175.8690	172.6537
<b>3</b>	-2491.847	87.56580*	1.37e+64*	165.3654*	172.4193*	167.7036*

Source: Computed by the Author (2017)

\* represents lag order as selected by the indicated criterion

AIC: Akaike information criterion; FPE: Final prediction error; HQ: Hannan-Quinn information criterion; SC: Schwarz information criterion; LR: sequential modified LR test statistic (each test at 5% level)

Table 7: Parsimonious ECM results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
<b>D(INS)</b>	0.053235	0.679204	0.078379	0.9382
<b>D(TEC)</b>	0.002744	0.001563	1.755031	0.0915
<b>D(IMP)</b>	-0.000878	0.001195	-0.735037	0.4694
<b>EDU</b>	0.000201	9.73E-05	2.066094	0.0498
<b>D(CAP)</b>	7.400000	2.440000	3.030675	0.0058
<b>D(LAB)</b>	0.004089	0.005381	0.759870	0.4547
<b>POL</b>	1.269726	1.025153	1.521458	0.1407
<b>ECM(-1)</b>	-0.313609	0.103340	-3.034706	0.0047

<b>C</b>	4004.112	5316.663	0.753125	0.4587
<b>R-squared</b>	0.626625	Mean dependent var		1500.876
<b>Adjusted R-squared</b>	0.559390	S.D. dependent var		9469.443
<b>S.E. of regression</b>	8149.279	Akaike info criterion		20.06156
<b>Sum squared resid</b>	1.59E+09	Schwarz criterion		21.40800
<b>Log likelihood</b>	-328.9850	Hannan-Quinn criter.		21.18303
<b>F-statistic</b>	2.551056	Durbin-Watson stat		1.961954
<b>Prob(F-statistic)</b>	0.040958			

Source: Computed by the Author (2016)

Table 2 shows the level of correlation of industrial output equation variables among themselves. The table indicates that all the regressors in the model are positively related to industrial output. While other variables are highly and positively related with each other, human capital (EDU) is negatively and lowly related with institutional quality, capital stock, imports and policy changes. Both the ADF and PP tests were undertaken to determine the stationarity of the series regression for the variables. Results of the tests using the augmented Dickey-Fuller technique (ADF) as shown in table 3 indicate that all the variables in the equation were stationary at first difference and integrated of order one I(1) but EDU exhibited stationarity at level and is integrated of order zero I(0).

Table 4 presents results for the Granger causality tests. The results show that there is no Granger causality between policy reforms, institutional quality and industrial growth, these indicate that neither institutional quality nor policy reforms Granger causes industrial growth and vice versa. From the results of the Johansen cointegration tests as shown in table 5, the variables are cointegrated and significant at five percent significant level. Both the trace statistics and maximum Eigen value statistics showed at most nine cointegrating relationships. We can infer from this result that there exist unique long-run equilibrium relationships between INQ, POL, INS, IMP, CAP, LAB, EDU and TEC. From table 6, the values of FPE, AIC, SC, and HQ indicate that the chosen optimal lag length in the ECM for industrial growth equation is two (2).

The parsimonious error correction result shown in table 7 indicates that the adjusted R<sup>2</sup> is about 0.56 meaning that 56 percent of total changes in industrial output can be explained by changes in the variables in the equation. The value



of Durbin-Watson statistics of 1.96 (approximately 2.0) means that there is no serial autocorrelation between the variables, therefore the result is good to be employed for econometric analysis. Also, F-statistics which measures the total significance of the regressors in the equation is statistically significant with a value of 2.55. The speed of adjustment coefficient for industrial growth, which indicates the speed with which the dynamic model restores back to equilibrium when it deviates was (-0.313) negative and significant at less than one percent significant level judging from the P-value of (0.0047). This suggests the existence of a long run equilibrium relationship between industrial growth and the variables that influenced its short run movement which are captured in the model. This indicates an adjustment speed of 31.3 percent.

The ECM results indicate that policy reforms (POL) have positive but insignificant impact on industrial sector growth in Nigeria. Equally, institutional quality (INS) coefficient was positive but statistically insignificant. These mean that both industrial policy reforms and institutional quality do not significantly impact industrial growth in the country. These do not agree with the apriori expectations as it is expected that inclusive policy reforms should favour industrial progress and as well, efficient and effective institutional quality should stimulate industrial growth. Import (IMP) coefficient is negative and insignificant meaning that imports contribute negatively to industrial growth in Nigeria. This result is contrary to the apriori expectations. The same goes for labour force (LAB) and technology (TEC) which also contributed insignificantly to industrial growth in Nigeria. However, both human capital (EDU) and capital stock (CAP) coefficients were positive and significant. The positive and significant coefficients of 0.002 for human capital and 7.4 for capital stock means that human capital and physical capital formation are important ingredients for fostering industrial growth in Nigeria.

### **Discussion of results**

From the results of this study, policy reforms (POL) has positive but insignificant impact on industrial sector growth in Nigeria. This result supports Ekpo (2014) but contradicts Omojimiti (2012) who showed that policies and institutional reforms accounts for positive changes in industries output, even though his focus was on reforms in the financial system and agricultural industries. On the whole, it is expected that inclusive policy reforms should attract private sector investment, increase total factor productivity and enhance

more industrial productivity. However, the case is different for Nigeria as shown in this study, but with a positive coefficient for policy reforms, it is hopeful that if industrial policies are made to be inclusive, industry base and investment enhancing, we are most likely to experience greater industrial progress. As noted by Robinson (2009) it could be that industry policy in Nigeria, as in other African countries, is driven by the desire to satisfy reasons generally inconsistent with economic growth.

Institutional quality was shown not to significantly impact industrial growth in Nigeria. This is contrary to economic expectations though the coefficient was positive. This result is however in line with the findings of Anwana (2016b) that institutions hamper industrial and economic development in Nigeria. Mukoyama and Popov (2015) revealed that, on the path way to industrial development, nations try to move to industrial production processes that emphasise relations specific investments. They showed that inability to conclude contracts do lead to imbalance in the use of inputs and imbalance in production of varied goods. Also, production inefficiencies and imperfect contract enforcement all translate to distort factor supply. So, enforcements institutions should be enhanced to gain workable contractual environment, as positive changes in industry composition highly depends on successful enthrone of conducive contractual environment over time. However, the positive coefficient of the institutional quality in this study could indicate that with effective, efficient and improved institutional quality, industrial growth can be enhanced.

Import (IMP) coefficient was shown to be negative and insignificant meaning that imports contribute negatively to industrial growth in Nigeria. But as indicated by Grossman and Helpman (1992) and Romer (1988), imports do help industries to grow through bringing in of new technologies, locally unavailable raw materials and machineries for industries. This result confirms the results in Adeoye (2005) that Nigeria's economy has not really changed from the previous status of her import structure of finished goods, used and second hand electronics, clothes and other consumables not related to those goods that can engender industrialization. This is happening in negation to the goals of various strategies and policies put in place by the government of Nigeria to correct this ugly trend. This shows that Nigeria's imports of industrial raw materials, machines, tools and equipments that would have enhanced industrial

development are insignificant to help boost industrialization process in the country.

### **Conclusion**

The findings of this research study show that policy reforms do not contribute significantly to industrial growth in the country. Further, it was discovered that institutional quality in Nigeria does not significantly impact industrial growth. On the basis of these findings, it is concluded that policy reforms through policy formulations and implementations are not effective to engender significant industrial growth. Also, though institutional quality can impact and encourage all the sectors of an economy, it was found to insignificantly contribute to industrial sector growth in Nigeria. This suggests that institutional quality, policy formulation and most importantly, policy implementation in the country are not effective and efficient to impinge on the industrial sector positively and drive the necessary growth in the sector. However, if institutional quality is improved and made to be effective and policies well formulated and implemented, these will promote industrial growth and engender sustainable economic growth in the country. So, weak and inefficient institutional quality and ineffective policy implementations are among the key factors inhibiting industrial sector growth in Nigeria.

### **Recommendations**

1. The study shows that industrial policy reforms and implementations in Nigeria do not impact significantly on industrial growth. Policies are basically formulated with some growth targets and serve to guide actual and physical achievements if properly implemented. Industrial policies formulation in Nigeria should therefore be driven by the desire to satisfy reasons generally consistent with economic growth. Further, they should not only be made enticing and juicy on papers, they should be effectively and efficiently enforced, implemented and or put into action by all the relevant authorities. Above all, policies should be inclusive, investment enhancing oriented and suitable to our economy.
2. It is shown in this study that institutional quality does not significantly impact on industrial sector growth. To enhance institutional quality and therefore boost industrial sector growth, the nation's laws and contract enforcement mechanisms should be overhauled and strengthened. This will help to

encourage contract enforcement and maintenance of law and order, protect property rights and encourage industrialisation. Thus, there is need to develop and implement policies that will encourage contract enforcements, enhance property rights, fight corruption genuinely, enthrone good and effective governance and political institutions, restructure and genuinely improve the legal and security systems and refurbish the educational system among others.

3. The study also showed that imports negatively impact industrial sector growth in Nigeria, to improve the situation, it is recommended that imports of finished goods that compete unfavourably with made in Nigeria goods should be discouraged. Exports of the country's industrial outputs should be encouraged with enabling policies.

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