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DOMESTIC MACROECONOMIC DRIVERS OF INDUSTRIALIZATION IN NIGERIA: STATUS AND PROSPECTS FROM THE MANUFACTURING SUB-SECTOR

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ABSTRACT: *While most advanced economies are in the process of industrializing their economies, plots by successive governments to transform the economy Nigerian, from a commodity-driven to an industrialized one, has not yielded much fruits despite several industrial policies and reforms. Based on the United Nations/World Bank success yardsticks with theoretical framework rooted on the Prebisch-Singer Hypothesis and the endogenous growth model, this study utilized K-class estimation procedure on Nigeria's time series between 1990 and 2016. The result obtained indicates that infrastructural development, institutional framework, bank credit,foreign direct investment, electricity, stable exchange rate, low inflation and economic diversification are key drivers of industrialization. The findings also confirm that except the Nigerian economy achieves improved infrastructure delivery and institutional framework as well as stable domestic and currency prices, the efforts towards economic diversification agenda may be counterproductive. It is therefore expedient that Nigeria focuses on building strong macroeconomic fundamental that would accentuate its take-off to industrialization.*

KEYWORDS: Diversification, Gross Domestic Product, Industrialization, Macroeconomy, Manufacturing, Nigeria

JEL Classification Code: E24, O14, O11, L6, N67

INTRODUCTION

Industrialization, a major macroeconomic goal of every developing nation, aims at increasing the pace of economic growth and ensuring swift sectoral economic transformation. It refersto a sustained pattern of rapid growth of manufacturing value-added and Todaro and Smith (2011) see it as a process of building up a country's capacity by processing raw materials for consumption and for further production. The World Bank Development Report (1987) asserts thatindustrialization is an essential requirement for economic development because it is: a training ground for skill development; a provider of employment, domestic, and foreign earnings; a necessary condition for structural change and diversification; can increase flexibility of an economy as well as reduce economic dependence.

To Zattler (1996) and Dijkstra (2000), industrialization is desirable for two main reasons: it enables the manufacturing sector to foster growth in productivity and technology spillovers to other sectors of the economy; and it diversifies a developing economy away from primary production into wider revenue streams thereby improving the country's terms of trade.However the degree to which an economy can industrialize depend on the prevailing domestic macroeconomic environment as well as the complementarities amongst economic policies targeted at shifting resources from low productivity to high-productivity sectors.

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Nigeria's Vision 20:2020 aims to transform Nigeria into: the twentieth largest economies in the world by 2020, the 12th largest world economy by 2050, and into a sound, unwavering and globally resilient economy with a GDP of not less than US$900 billion and a per capita income of $4,000 per annum (CBN, 2009). Nigeria is therefore desirous of prosecutingan industrial strategy aimed at accomplishing immense global competitiveness in processed and manufactured commodities. Being an oil dependent economy, Nigeria is yet to achieve a significant accomplishment in its intent to join the league of industrial nations. The structure of the Nigerian economy is representative of an underdeveloped economy as it relies on the extraction of primary produce crude oil for 95% foreign exchange and more than 85% of its government revenue.

Table 1 representsoscillating evidences of industrial growth across its broad sub-sectors including manufacturing, mining, consumer goods, capital goods, among others.

Table 1: Industrial Sector Growth by Broad Sub-sectors 2007-2017Q1

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017 (Q1)
Primary goods for Household Consumption	0.40	0.40	0.70	0.80	0.68	0.76	0.99	1.05	2.81	2.59	2.89
Primary goods for Industry	6.80	2.40	3.40	2.20	9.38	4.98	3.04	3.89	3.93	3.32	3.82
Manufacturing	9.57	8.89	7.85	7.57	17.82	13.46	21.80	14.72	-1.46	11.69	8.32
Mining	-4.32	-5.91	0.66	5.38	2.41	-4.78	-12.81	-1.13	-5.27	-6.40	-4.27
Electricity, Gas and Water	4.93	3.74	3.23	3.28	32.52	13.04	18.81	-3.32	-3.96	3.85	-1.14
Consumer Goods	4.60	5.70	9.20	9.30	6.73	3.10	6.62	6.77	5.95	4.46	4.31
Capital goods	16.90	22.30	15.50	15.40	11.72	11.81	10.42	17.11	15.84	16.16	12.88
Durable	1.60	2.10	3.50	3.00	1.76	1.05	0.89	2.53	1.65	0.79	0.69
Non-durable	2.40	1.90	3.10	3.50	3.53	1.36	4.61	2.88	2.99	2.71	2.77
Semi-durable	0.60	1.60	2.70	2.70	1.43	0.70	1.12	1.36	1.31	0.96	0.85

Source: *Nigerian Bureau of Statistics(2016)*

Of particular interest is the manufacturing sub-sector occupies prominence as it supplies inputs to the other sub-sectors which came to an all time low in 2015 and further took a downturn in the first quarter of 2017 following positive growth in 2016. These observed fluctuations in both the manufacturing sub-sector growth may have affected the overall industrial growth in Nigeria.There are no doubts about the positive contributions of its real sector activities to economic growth but what remains an issue is the current deterioration in the rate at which Nigeria is pursuing its industrialization process as observed in Figure 1.

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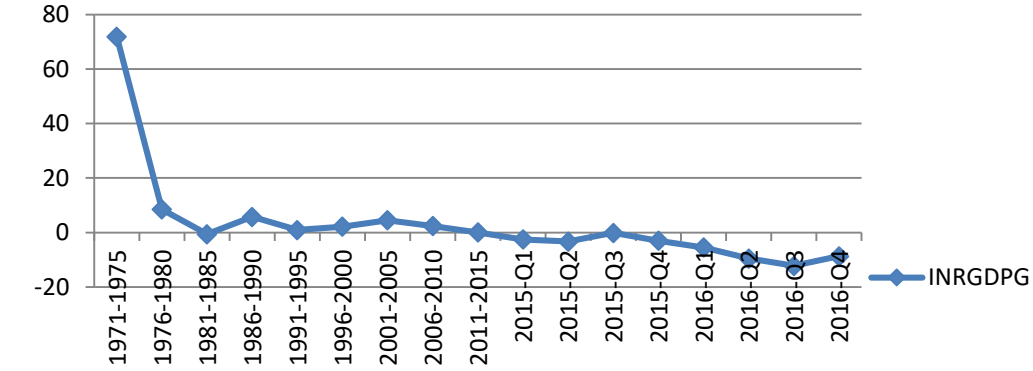

Figure 1
Real Industrial Sector Contributions to GDP (%) 1971 -2016

Source: Nwokoye, Kalu & Nwosu (2017)

A foremost cause of this deterioration is Nigeria's low level of industrialization as posited by the negative growth in industrial output and evidenced in declining average capacity manufacturing utilization which is premised on under-utilization and inefficient usage of capital. The industrial sector's contributions to GDP as shown in Figure 1 have also declined over the years; from an all-time-high of nearly 72% between 1971and 1975, to 2.4% between 2006 and 2010 and -9% as at the last quarter of 2016.Figure 2 shows wide oscillationsin manufacturing sub-sector production that measures manufacturing production growth rate in Nigeria.

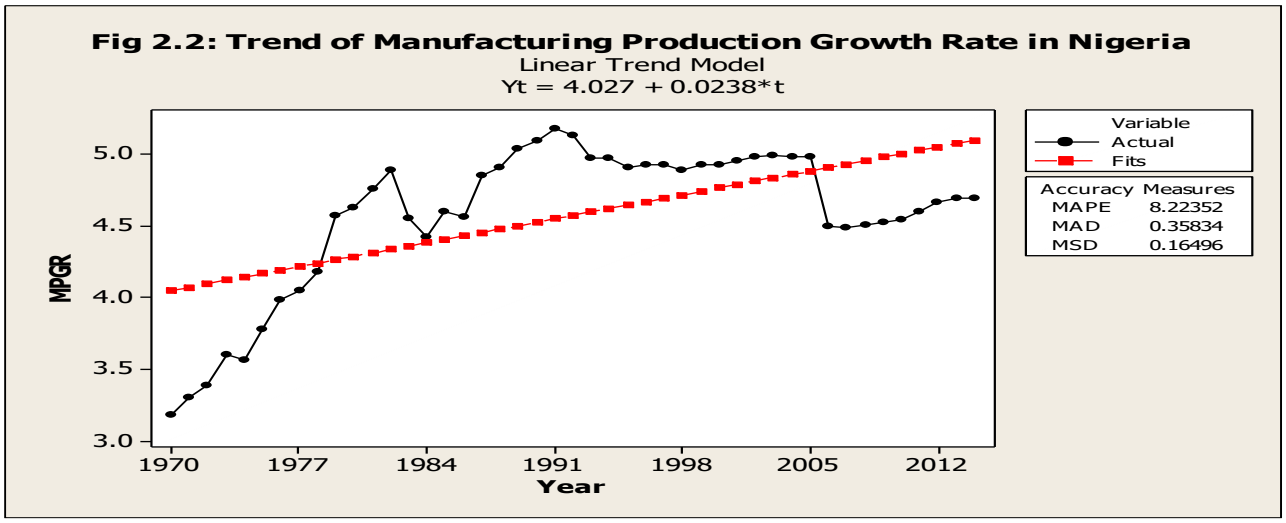

Figure 2: Trend of Manufacturing Production Growth Rate in Nigeria 1970-2014

Source: CBN Statistical Bulletin (various issues)

Figure 2 depicts positive trend over time and the fitted regression line supports the view of upward trend of manufacturing production growth rate. This is shown by the positive slope

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coefficient of 0.024. By implication, manufacturing production growth rate has been on the increase over the study period but this increase is marginal and not significant.

Nigeria's manufacturing sub-sector comprises of oil refining; cement; food, beverages & tobacco; textile, apparel and footwear; wood & wood products; pulp paper & paper products; chemical & pharmaceutical products; non-metallic products, plastic & rubber products; electrical & electronics; basic metal, iron & steel; motor vehicles & assembly; and other manufacturing. Egbon (1995) view Nigerian manufacturing sub-sector as the main instrument of rapid growth, structural change and self-sufficiency. A number of industrial policies have been geared towards improving the economic performance of the supply side of the economy. However, in the face of these policies, the performance of the manufacturing sub-sector contributions to GDP has not been impressive as shown in Figure 3.

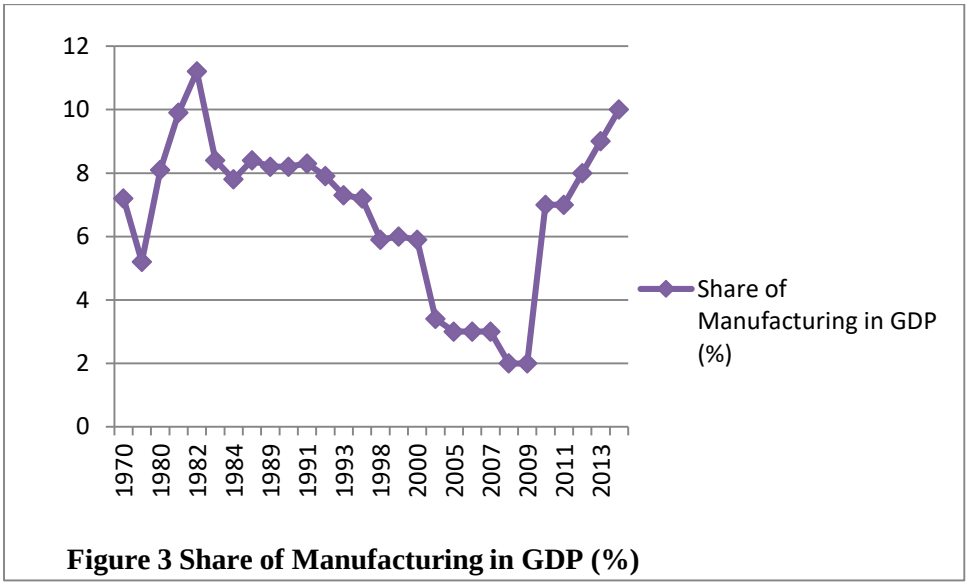

Figure 3 Share of Manufacturing in GDP (%)

***Source**: Central Bank of Nigeria, Statistical Bulletin (Various Issues)*

The share of manufacturing GDP which is another indicator of the performance of manufacturing sub-sector was 7.2% in 1970. It fell to 5.2% in 1975 before increasing gradually to 11.2% in 1982. Fallowing the depressing state of the economy in the 1980s, manufacturing share in the GDP fell and remained in the range of 7.8%and 8.4%. With the unsteady growth in manufacturing production since 1992, the contribution of the manufacturing industry to the GDP fell. For instance, between 1993 and 2001, it ranged between 8.3% and 3.4%. This is a strong indication that the manufacturing sub-sector contribution has been dwindling. Between 2002 and 2007, manufacturing share in the GDP witnessed only marginal increase of 3.0 percent. A decline in manufacturing share in the GDP was witnessed from 2008 to 2009 butit rose consistently from 7% in 2010 to 10% in 2014. Its further decline to -1.3% in the last quarter of 2016 left a lot to be desired. Even though its contributions to the GDP shrank by N80billion in nominal terms as at the first quarter of 2017, by the third quarter of the same year, it stood at 8.81%

Figure 4show that the average capacity utilization for the manufacturing sub-sector was 76.6% in 1975. It fell from 70.1% in 1980 to 43 .8% in 1989. The capacity utilization of the manufacturing sub-sector further dwindled in the 1990s and ranged between 40.3% and 34.6%; while 36.1% and 54.8% were recorded in 2000 and 2005 respectively. The improved

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performance in the manufacturing sub-sector between 2000 and 2005 was attributed to a number of factors including the relative macroeconomic stability and the regular supply of petroleum products.

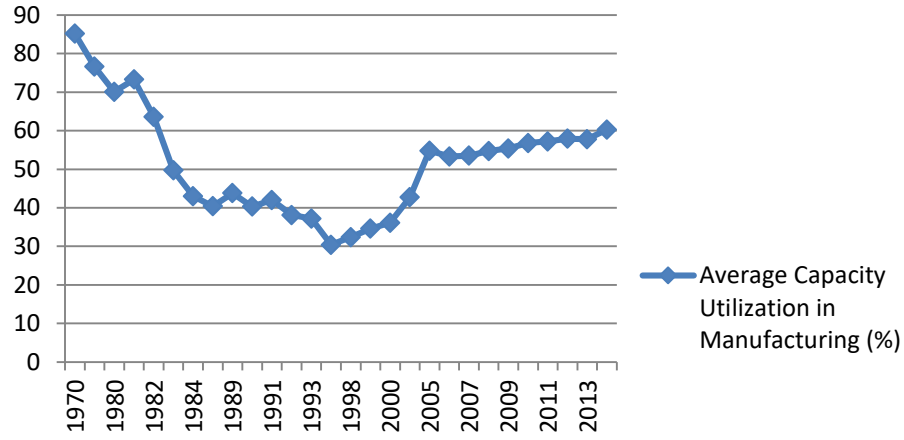

Figure 4: Average Capacity Utilization in Manufacturing (%)

Source: CBN Statistical Bulletin (2016)

The capacity utilization of the manufacturing sub-sector further dwindled to 53.3% in 2006. A brief spike in manufacturing capacity utilization was observed in 2010 as capacity utilization stood at 56.79% before peaking at 60.3% in 2014. This development was attributed to the increase in manufacturing activities occasioned by increased investment in the pharmaceutical, food, beverages and auto-mobile sectors (CBN, 2014).

An appraisal of the Nigeria's manufacturing sub-sector indicates that it has not improved in the light of the various industrial policies which the country has been adopted (including the recent trade and financial liberalization policy, tax policies, export promotion strategies and anti-dumping laws, amongst others). This underscores the need for implementing policies which are expected to enable the manufacturing sub-sector to contribute significantly to the industrialization of the Nigerian economy.

According to Adoghor and Brown (2009), Nigeria's manufacturing sub-sector suffer from low level of technology, exclusive public sector ownership of the core industrial projects (CIPs) and utility enterprises, low level of capacity utilization, low investment and high production cost. Loto (2005) assert that the factors such as weak raw materials base resulting in excessive dependence on imported inputs, inadequate linkages among the manufacturing sub-groups partly due to the inefficient performance of the basic industries and little investment in basis research, poor technological base to support growth in manufacturing activities, foreign exchange scarcity amongst others, militate against increased industrial production and diversification of the Nigerian economy.

As noted by African Transformation Report (2014) one essential requirement for industrialization is the capability of producing a widening array of goods and services. Thus the manufacturing sector is a key driver of Nigeria's industrialization. According to Arrow

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(1962) and Lall (1992), acquisition of new technologies, innovation, and learning-by-doing are critical for acquiring production capabilities. However, for a primary product monolithic economy like Nigeria, acquiring production capabilities requires structural transformations. Mehta (2012) asserts that the quest for structural transformation is the vehicle for technological advancement and innovation but as argued by Mijiyawa (2017), structural transformation is contingent on the institutional environment of an economy. The institutional environment that defines how the superstructure operates, how infrastructures are assigned, and the rules of the game in turn determine the nature and structure of economic transformation. In other words, institutional differences play an important role in shaping innovation intensity and technological patterns which are top requirements for industrialization.

Although, the macroeconomic drivers of industrialization have been intensively investigated (Abramovitz, 1986; Chong & Calderon, 2000; Szirmai, 2009; Effion & Udah, 2014), little attention has been given to the role of institution and economic diversification in the process of industrialization in Africa. Earlier economic theories (especially Smithian and Ricardian typologies) emphasize specialization in the production of commodity of comparative advantage. Following such theoretical predictions, most African countries specialized in primary production simply because that is what they have the capacity to produce. But as noted, specialization is a market-based choice which focuses on a subset of goods and services that a country is capable of producing, rather than a choice foisted on a country because of its lacks the capabilities to produce anything else! Since competitive advantage can be garnered through structural transformation (Mijiyawa, 2017) and technological advancement (Mehta, 2012) and Lall, 1992), diversification into (and later specialization in) the manufacturing sector can drive the industrialization process in Africa. As the campaign for diversification has continued to gain momentum in Nigeria, there is hardly any macroeconomic study on its nexus with industrialization in Nigeria.

Again, in recent time, the role of institution in driving the industrialization process is gaining traction. However, the classical and neoclassical theories assumed away the place of institution in economic process. In the description of how the economy works, the neoclassical model predicts that exchanges arise spontaneously from the atomistic interaction of self-seeking individuals. The Walrasian condition guarantees equilibrium such that all market participants are pareto optimal and the overall economic outcome is also optimal. Here, institutions are not necessary since exchange is simply driven by utility considerations. Although the more relaxed versions of the neoclassical model recognizes property rights and monetary institution, Hodgson (1992) argue that even in the so-called relaxed versions, both the property right and monetary institutions are assumed to play neutral roles. As noted by Stein (1994), this view has been countered by the institutionalists as Coarse (1992) and Laitner (2000) (relying on the same neoclassical precepts) see institutions as frameworks that must be concertedly established to reduce transaction and information costs. Laitner (2000) also argue that except there is a change in the subsisting institutional arrangement that sustain a mono-cultural economy, structural transformation may be elusive. Thus, in this paper, we introduce the current status of institutional framework as well as the required status of institutional framework so as to ascertain how these variables drive Nigeria's industrialization through the manufacturing subsector.

Given that the roles of economic diversification and specialization in driving industrialization in Nigeria has been rarely studied, in addition to such macroeconomic conditions such as inflation, FDI inflow, bank lending and energy supply, this paper investigates the role of

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economic diversification and specialization in driving industrialization in Nigeria. To this effect, this paper is structured as follows: Section one captures the introduction, Section two contains the theoretical framework of the study, Section three contains the research procedure, Section four presents and discusses the results while Section five concludes the study and makes some policy recommendations.

THEORETICAL FRAMEWORK

The Prebisch-Singer hypothesis (PSH) is credited to Prebisch (1950) and Singer (1950) and emphasizes that the economy cannot grow based on production and export of primary products because the ratio of export prices to import prices (that is the terms of trade) for countries which are heavily reliant on exports of primary commodities declines continuously. In summary, the PSH provide a case in support of economic diversification by explaining the disadvantages of specializing in agricultural and the crude oil sector (as is the case with Nigeria). In principle, these arguments can therefore serve as a rationale and as a theoretical justification for embarking on industrialization through economic diversification.

The endogenous growth modelalso provides the theoretical framework for this study because it has become a benchmark framework for analyzing long-run determinants of output. It is also hinged on the assumption of increasing returns to scale for the manufacturing sector and constant returns to scale for the primary sector. It exposes that a country's manufacturing output will grow faster (or slower) than that of the rest of the world if it had an initial comparative advantage in manufacturing (or primary) sector as hypothesized by the Prebisch-Singer hypothesis.

The endogenous growth models explains that economic progress can be achieved within the system governing the production process instead of by forces operating outside the system as presented by the Solow residual in the neoclassical growth model. Most of the endogenous growth models introduce capital like human capital, knowledge and infrastructure, whose accumulation is not subject to the assumption of diminishing marginal returns. An endogenous growth model of the *AK* type as introduced by Newman (1957) assumes an economy with a production function specified as:

$$Y = aK \qquad 1$$

where output (Y) is proportional to the capital stock (*K*); the marginal product of capital is simply the constant (*a*). Furthermore, the endogenous growth theory hinges on the notion that there are substantial external returns to capital especially human capital as each new idea (knowledge) makes the next idea possible hence knowledge can grow indefinitely. The new growth theorists believe that research/development and investment in human capital are the keys to economic progress therefore Equation 1 may be further expressed as

$$Y_t = AK_t^{\alpha} L_t^{\beta} \qquad 2$$

where α and β are the respective shares of capital and labour in the production process. By dividing Equation 2 by L, the intensive form of the equation becomes:

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$$y_t = Ak_t^{\alpha} \quad 3$$

where (*Y*) is economic progress; (*A*) is any factor that influences the level of domestic production technique, (*K*) is capital per worker. This model assumes increasing returns to scale and diminishing marginal productivity of factor inputs.In order to ascertain and interrogate Nigeria's domestic macroeconomic drivers as part of the reason for industrialization in Nigeria, this study relies on the United Nations/World Bank success yardsticks which propose that the core explanatory variables for industrialization include the per capita GDP which captures the market size, human capital captured by labour employment in the manufacturing sector, FDI inflow into the manufacturing sector (which captures the extent of spillovers), commercial bank credit to private sector, infrastructural development captured by electricity consumption, interest rate (which captures the extent of macroeconomic stability).

DATA AND METHOD OF STUDY

Econometric Procedure

As noted earlier, Nigeria has designed several programs and policies aimed at transiting from resource-based economy to an industry-based economy. However, the suboptimal outcome from such policies and programs has reawakened the pursuit for understanding macroeconomic fundamentals that could be manipulated to achieve such goals. This study adopted a macro-econometric procedure in order to understand the behavior of the macroeconomic environment within which the manufacturing sub-sector operates. In addition to preliminary review of literature, the following macroeconomic indicators and variables for this study were identified: manufacturing sector productivity(MP), manufacturing capacity utilization (MC), economic diversification(ED), quality of institution(QIS), quality of infrastructure(QIF), exchange rate volatility(ERV), inflation(INF), foreign direct investment(FDI), industrial electricity consumption(ELEC) and deposit money banks credit to the manufacturing sector(MCRE). Due to observed endogeneity, the K-class estimation was adopted for the macro-econometric estimations. The K-class model is specified as follows:

$$y_{i,t} = \Pi_i + \sum_{\substack{p=0 \\ i=1}}^{P} \Psi_{i,k} X_{i,k,t} + \sum_{\substack{n=1 \\ i=1}}^{N} Z_{i,n,t} + \varepsilon_{i,t} \; i = 1,...,I \; t = \tau + 1,...,T \; 4$$

Where y_{it} is a 4 x 1 column vector of response variables such that y_{it} = MP, aMP, MC, aMC. $X_{i,k}$ is a 4 x N vector of explanatory variables such that $X_{i,k}$= ED, QIS, QIF, ERV, INF, FDI, ELEC, MCRE. Also, $Z_{i,n}$ is 2 x N vector of instrumental variables such that $Z_{i,n}$= RGDP, manufacturing employment (MEMP), private sector operating surpluses (PROF), lending rate (LER) and lagged explanatory and Z variables. $\Pi_{i,}$ and $\psi_{i,k}$ are intercept and slope parameters respectively.

In estimating K-class models, the choice of *k* and covariance matrix affects the unbiasedness of the estimates. The k-class estimator, ψ_k, is defined as :

$$\psi_k = (X'(I - kM_z)X)^{-1} X'(I - kM_z)y \quad 5$$

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Where $k = \lambda - \alpha(n-K)$, $Mz = I - Z(Z'Z)^{-1}Z'$, λ is the root that minimizes the variance-covariance matrix such that $|Q_1 - \rho Q| = 0$ (where Q_1 is the variance-covariance matrix of the residuals from the regressions of y_i on X_i and Q is the variance-covariance matrix of the residuals from the regressions of $X_{.i}$ on Z. The covariance matrix estimator is defined as:

$$\hat{\sum}_k = s^2(X'(I - kM_z)X)^{-1} \quad (6)$$

Data Construction and Data Source

Data used in all estimations were sourced differently. Real gross domestic product (RGDP), manufacturing capacity utilization (MC), manufacturing output(MANO), inflation (INF), DMBs credit to the manufacturing sector (MCRE) and exchange rate (EXR) were sourced from the CBNStatistical Bulletin (2014& 2016). Quality of institution (QIS) and quality of infrastructure (QIF) were sourced from the International Monetary Fund'sWorld Economic Outlook (2017). Electricity consumption (ELEC) and industrial labour participation (INDL) were obtained from World Bank'sWorld Development Indicators (2017).

In addition, the diversification index (DI), concentration index (CI), manufacturing sector labour productivity(MP) and exchange rate volatility (EXV) were constructed as follows:

Diversification index (DI): DI is a measure of the degree of economic diversification of an economy. Following Dimnwobi, et al (2017), we employed Herfindahl–Hirschman (H) approach to computing DI. DI is computed as the sum of the squares of the sectoral shares of the economy's output. Supposing that N sectors share all economic activities, each one with a contribution k_i and sectoral share $S_i = \frac{k_i}{\sum_{j=1}^{N} k_j}$ Then the DI can be expressed as: $DI = \sum_{i=1}^{N} S^2{}_i$

Since DI computed using Herfindahl–Hirschman (H) procedure can range from 1/*N* to one, we place a restriction such that it ranges from zero to one:

$DI^* = \frac{DI - 1/N}{1 - 1/N}$ for N >1. H* ranges from 0 to 1.

According to Tauer (1992) cited in Dimnwobi et al (2017), a DI* of 0.00 and 0.01, higher than 0.01 but below 0.15, between 0.15 to 0.25 and above 0.25 indicate a highly diversified economy, somewhat diversified economy, moderately diversified economy and undiversified economy respectively.

Concentration Ratio (CR): CR is a measure of sectoral concentration factor. The manufacturing sector concentration ratio was computed as follows:

$$CR_t = \frac{1}{100^{MANO_t}/_{RGDP_t}}$$

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Exchange Rate Volatility (ERV):ERV measures the pace at which currency prices move higher or lower, and how wildly they swing. In other words, it is the standard deviation of the change in exchange rate with a specific time horizon. Following Igbanugo and Eze (2017), we computed ERV as follows:

$$ERV_t = \frac{(EXR_t - EXR_{t-1})^2}{X}$$

where $X = \frac{\sum(EXR_t - EXR_{t-1})}{N}$ and N= number of observations

Manufacturing Labor Productivity (MP): Labour productivity measures the output per worker in the manufacturing sector. It is computed as $MP_t = \frac{MANO_t}{ML_t}$

All computations were performed using E-views software version 10.

PRESENTATION AND DISCUSSION OF RESULTS

We started the econometric analysis with the evaluation of time series properties of the data. Stationarity and cointegration test indicates that the time series are both integrated and cointegrated series. The Hausman test indicates that diversification index and manufacturing credit are endogenous in the manufacturing productivity and manufacturing capacity utilization models respectively. The endogenous problem was however taken care of by the k-class estimation. Four models were estimated with k-class estimation procedure. Table 1 contains the regression estimatesformanufacturing productivity (Model 1) and manufacturing capacity utilization (Model 2).

The results for Model 1 show that diversification and inflation strongly impacted on manufacturing productivity though exchange rate volatility, industrial electricity consumption, quality of institution and quality of infrastructure had weakimpacts on productivity in the manufacturing sub-sector. Results for Model 2 show that diversification, exchange rate volatility, electricity consumption and quality of infrastructure strongly impacted on the manufacturing capacity utilization rate for the period 1990 to 2016. Table 2 presents this.

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Table 2: Regression Estimates for manufacturing productivity and manufacturing capacity utilization

	Manufacturing Productivity (Model 1)	Manufacturing Capacity Utilization (Model 2)
Diversification index	0.0224(0.0106)**	0.0273(0.0154)*
Bank Credit to Private Sector (MCRE)	0.0072(0.0053)	0.0079(0.0045)
Exchange rate volatility (EXV)	-0.0246(0.0084)***	-0.0596(0.0231)**
Inflation (INF)	-0.9555(0.6618)*	-0.0880(0.5204)
FDI	0.1202(0.1432)	0.1290(0.1227)
Electricity consumption (ELEC)	0.0104(0.0202)	0.0180(0.0098)*
Quality of Institution(QIS)	-0.7422(0.0672)***	-0.8221(0.0100)***
Quality of Infrastructure(QIF)	-0.4562(0.1502)***	-0.3847(0.1580)**
QIS + 2.5	0.0937(0.0435)***	0.1005(0.0572)*
QIF + 2.5	0.6008(0.2431)***	0.1649(0.0128)***
INF – 5.0	(0.0372)**	0.0773(0.0323)**
Obs	116	116
R-square	0.84	0.89
DW	2.06	1.95
K	1.5	0.5
Covariance Matrix	K-class	K-class

, **, * indicates 10%, 5% and 1% significance level*

Exchange volatility can affect productivity and capacity utilization through change in the relative costs of production and increase in transaction costs as argued by Klein et al. (2003). Exchange rate volatility can also undermine productivity and capacity utilization through its effect on investment, inventories and employment. By decreasing the credit available from the banking system, exchange rate volatility can reduce investment and consequently productivity. According to Grier and Smallwood (2007), the negative effect of exchange rate volatility on productivity may be more severe in developing economies than developed economies due to high degree of dollarization and low financial development.

Table 3 contains the regression estimates for models 3 and 4. It also indicate that expanding or concentrating activities on the manufacturing sector may not change the negative effect of inflation and exchange rate volatility on the manufacturing sub-sector.

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Table 3: Regression estimated of expanding or concentrating activities on the manufacturing productivity and capacity utilization respectively.

	Manufacturing Productivity (3)	Manufacturing Capacity Utilization (4)
Diversification index	0.0016(0.0009)*	0.0012(0.007)*
Bank Credit to Private Sector (MCRE) x concentration Index	0.0108(0.0035)***	0.0032(0.0018)*
Exchange rate volatility (EXV) x concentration Index	-0.5088(0.0939)***	-0.0107(0.0035)***
Inflation (INF) x concentration index	-0.2333(0.0153)***	-0.0083(0.2194)
FDI x concentration index	0.1530(0.0849)*	0.0083(0.0034)
Electricity consumption (ELEC) x concentration Index	0.2737(0.0669)***	0.0001(0.0193)
Quality of Institution(QIS) x concentration index	0.0274(0.0669)	0.5868(0.2999)*
Quality of Infrastructure(QIF) x concentration Index	0.1506(0.0872)*	0.2939(0.2104)
QIS + 2.5 x concentration index	0.6762(0.1331)***	0.3200(0.1196)***
QIF + 2.5 x concentration index	0.3389(0.1560)**	0.6300(0.2020)***
INF – 5.0 x concentration index	0.1465(0.0721)**	0.0991(0.0362)***
Obs	116	116
R-square	0.70	0.73
DW	1.85	1.95
K	0.5	2.0
Covariance Matrix	K-class	K-class

, **, * indicates 10%, 5% and 1% significance level*

The current quality of institution and infrastructure appear to undermine both capacity utilization and productivity. This finding corroborates Nickell and Layard (1999) and Acemoglu and Johnson (2005).Inefficient institutions raise cost of enforcing contracts and transactions cost thereby impeding firm performance. Infrastructure is a core determinant of industrialization. As a result, weak transportation infrastructure may raise transportation and maintenance cost, lower contract and transaction delivery time, and limit firms' market reach as well as their market shares. Similarly, poor energy infrastructure may raise transaction cost as well as limit work-hour. Poor human capital development infrastructure, such as educational and health infrastructure will also reduce both the quantity and quality of human capital stock available to the firms.

The regression results also show that diversification, bank credit and FDI and electricity consumption are positively related with firms' productivity and capacity utilization. As shown in estimates for both Models 1 and 2, more of the variables are either weakly significant or not significant. FDI is important for industrialization through its role in augmenting productive capital in capital-scarce countries. Other benefits of FDI include importation of new technology

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and managerial know-how as well as access to foreign markets. Although, the standard neoclassical model predicts that FDI would raise firms' productivity through increased capital stock and technological transfer (Findlay, 1978), van Pottelsberghe de la Potterie and Lichtenberg (2001) argued that this prediction may be undermined. They noted that FDI inflow may not be accompanied by technological transfer if the multinational enterprises do not invest in R&D in the host country. This argument is plausible since most foreign firms invest in the host countries in order to exploit their technological advantage rather than to diffuse their technology.

Availability of loanable fund enhances production and market expansion and investment in R&D. R&D is the engine of innovation and technological advancement. As investment in R&D increases, firms' technology and innovativeness improves thereby lowering the cost of production and increasing productivity and profitability. Similarly, availability of credit also enhances the obtained value of assets by raising their prices. This finding corroborates Wa(2005) and Aurangzeb (2012) who provided evidence that credit to private sector drives industrial development in Macao and Pakistan respectively.

Energy is critical for both productivity improvement and capacity utilization. There is hardly any production activity that is done without energy input. Given that acute shortage of energy supply in Nigeria, firms respond in a number of ways. These include, investment in energy efficiency technology options, out-sourcing of the production of energy-intensive intermediate inputs, and self-generation of energy for all production activities. Whichever option that a firm takes raises operational costs and reduces capacity utilization and productivity. Regression coefficients for models 3 and 4 indicate that concentrating activities in the manufacturing sector may improve the effect of electricity consumption, bank credit and FDI on productivity and capacity utilization. Economic diversification appears to be significant (howbeit, weakly significant) in all regressions, thereby suggesting that although diversification is critical for industrialization, the current state of diversification is low.

In all estimations, we adjusted the quality of institution, infrastructure and inflation. While 2.5 points were added to both qualityof institution and quality infrastructure, 5.0 points were taken away from inflation. This was to enable us obtain evidence for the effects of strong institutions, good infrastructure and moderate inflation on productivity and capacity utilization. The results thus obtained show that strong institution, good infrastructure and moderate inflation could be strong drivers of industrialization.

POLICY IMPLICATION AND RECOMMENDATION

Industrialization has been identified as the engine of growth. All advanced economies started their journey to advancement through industrialization. Having observed that that the roles of economic diversification and specialization in driving industrialization in Nigeria have not been documented in economic literature, our paper introduced the current status of institutional framework, the required status of institutional framework as well as such macroeconomic conditions such as inflation, FDI inflow, bank lending and energy supply in order to ascertain how these variables drive Nigeria's industrialization through the manufacturing subsector.

The findings of this study have contributed to knowledge by indicating that diversification into the manufacturing sector is prerequisite for industrialization. In the same vein, access to credit,

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FDI inflow, adequate supply of electricity, strong institution and adequate provision of infrastructure are essential drivers of industrialization. Exchange rate volatility and inflation are critical domestic macroeconomic fundamentals that undermine industrialization. The study suggests that if diversification is achieved without controlling inflationary and exchange rate pressures, the health of the industrial sector would still be in jeopardy. Thus, to achieve industrialization, currency price gyration and high inflation must be tamed. This also points to the critical role of institution in achieving industrialization. For instance, the institutional framework that involves property rights, legal institutions, labor market institutions, monetary and fiscal policy frameworks are needed to achieve low inflation, stable exchange rate, internalize the gains of FDI and achieve adequate and sustainable energy supply. It is therefore expedient that Nigeria focuses on building strong macroeconomic fundamental that would accentuate its take-off to industrialized economy.

REFERENCES

Acemoglu, D. and Johnson, S. (2005) *Unbundling institutions,* Journal of Political Economy, 113(5) 949-095.

Adoghor, G. and Brown, E.D. (2009)*Determinants of investment behaviour in Nigeria manufacturing sector,* Journal of Social Sciences, 1(2).

Aurangzeb, D. (2012) *Contributions of banking sector in real sector growth: A case of Pakistan,* Economics and Finance Review, 2(6) 45-54.

Briault, C. (1995) *The costs of inflation,* Bank of England Quarterly Bulletin, February, 33-45.

Central Bank of Nigeria (2009) 50 Years of Central Banking in Nigeria, 1958-2008, CBN, Abuja.

Central Bank of Nigeria (2014) Annual economic report for 2014,CBN, Abuja.

Dijkstra, A.G. (2000) *Trade liberalization and industrial development in Latin America,* World Development, 28(9) 1567–1582.

Dimnwobi, S.K., Nwokoye, E.S., Ekesiobi, C.S., and Igboanugo, C.I. (2017) *Transportation infrastructure and diversification of Nigeria's economy: Implications for the developmental state,* Nigerian Journal of Economics and Social Studies, 59(3) 309-330.

Egbon, P.C. (1995) *Industrial policy and manufacturing performance in Nigeria,* National Centre forEconomic Management and Administration Monograph Issue No. 7.

Findlay, R. (1978) *Relative backwardness, direct foreign investment, and the transfer of technology: A simple dynamic model,* Quarterly Journal ofEconomics, 92 1-16.

Grier, K.B. and Smallwood, A.D. (2007) *Uncertainty and export performance: Evidence from 18 Countries,* Journal of Money, Credit and Banking, 39(4) 965-979.

Igbanugo, I.C. and Eze, A.E. (2017) *Empirical analysis of exchange rate regime and external reserves accumulation in Nigeria (1970-2015),* International Journal of Research in Management, Economics and Commerce, 7(7) 69-79.

Klein, M., Schuh, S., and Triest, R. (2003)*Job creation, job destruction, and the real exchange rate,* Journal of International Economics, 59(2) 239–265.

Nickell, S. and Layard, R. (1999) *Labor market institutions and economic performance,* In Handbook of Labor Economics, vol. 3, (Eds, Ashenfelter, O.and Card, D.), Elsevier, pp. 3029-3084.

Print ISSN: 2053-2199 (Print), Online ISSN: 2053-2202(Online)

Nwokoye, E.S., Kalu, C.U., and Nwosu, C. (2017) *Moving the Nigerian economy from recession to renaissance: Where lies the solution?* IOSR Journal of Economics and Finance, 9(2), 75-90.

Thornton, D. (1996) *The costs and benefits of price stability: An assessment of Howitt's rule,*Federal Reserve Bank of St. Louis Review, March/April, 23-38.

Todaro, M.P. and Smith, S.C. (2011) Economic development (11thed), England: Pearson Educational Limited.

Van Pottlesberghe de la Potterie, B. and Lichtenberg, F. (2001) *Does foreign direct investment transfer technology across borders?* The Review of Economicsand Statistics, 83, 490-497.

Wa, H. (2005) *Bank Credit and Economic Growth in Macao,* Retrieved from: http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.514.7696&rep=rep1&type=pdf

World Bank (1987) World development report,Washington DC.

Zattler, J. (1996) *Trade policy in developing countries*, Intereconomics, 31(5), 229-236.

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