

Domestic Competitiveness of the Nigerian Manufacturing Sector: Implications for African Free Trade Area

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Abstract

The manufacturing sector is well known to be one of the major growth engines in all economies hence the decision to evaluate the competitiveness of the sector as Africa launches the largest free trade area since the creation of the World Trade Organization.; Africa Continental Free Trade Area (AfCFTA). The aim of this paper is to determine the internal competitiveness of the manufacturing sector vis a vis other sectors in Nigeria as well as the sub-sectors driving competitiveness in the sector in order to consolidate on the strong drivers while strengthening the weaker sub-sectors to be able to benefit optimally from the gains of the AfCFTA. Employing time series data sourced from the World Development Indicators and the Central Bank of Nigeria statistical bulletins on growth of GDP per capita (proxied for competitiveness), the share of manufacturing, service and agriculture in GDP, an ARDL specification was estimated. The findings show that the manufacturing sector in Nigeria is very uncompetitive. The paper therefore recommends a thorough overhaul of the structures that drive competitiveness in the manufacturing sector.

Keywords: AfCFTA, trade agreement, competitiveness, manufacturing, service, agricultural, sector, GDP per capita.

JEL Classification: F15, F13, F23, F31, F10, L60

Introduction

The reality of the globalized trading environment dictates an increased need for improved competitiveness. Economic strength and stability of nations have in recent times been redefined by sustained increase in competitiveness (Singh, 2004). The manufacturing sector of any economy is considered as one of its growth engines without exceptions to Nigeria as it is a huge employer of both skilled and unskilled labour resulting in increased household incomes and domestic demand thus generating considerable backward and forward linkages with other sectors (Signé, ;2018Yaw et al.,2016; Rodrik, 2012, 2016; Tybout, 2000; Kuznets and John, 1966). In the second quarter of 2019, the Nigerian manufacturing sector's contribution to real Gross Domestic Product (GDP) was 9.10%, which is less than 9.29% recorded in the second quarter of 2018 and 9.79% recorded in the first quarter of 2019 and by the end of the year, the total contribution of the sector to nominal GDP was 11.64 percent coming behind the trade sector (15.61 percent),

agriculture (22.12 percent) and after information and communication (10.68 percent), and mining and quarrying (8.85 percent), making the five highest contributor to GDP (CBN, 2019).

The manufacturing sector is a principal sector in several ways in both developed and emerging economies because it is a conduit for increasing growth factors such as productivity and competitiveness by increasing investment capital and encouraging linkages within and among several sectors of the economy, increased employment levels, improved terms of trade and balance of payment positions by raising the magnitude of foreign exchange earnings by increasing exports while substituting imports with improved domestic manufactures, increased income per capita and overall wellbeing of the citizenry.

Competitiveness is a broad, relative, complex, multi-dimensional concept with changing definition depending on the perspective of the investigator and the school of thought, incorporating different aspects thus resulting in divergent views by different scholars without a clear-cut consensus (Sanfey and Zeh, 2012). Hence, studies evaluating competitiveness are usually based on several components although it is not uncommon to also find studies which used only one measure of competitiveness. According to the World Economic Forum (WEF, 1979) Report, competitiveness is defined as the ability of a country to achieve sustained high rates of growth in GDP per capita. Although a consensus has not been reached on the definitive measure of competitiveness, two schools of thought are however supreme in choosing the tools of measurement – neoclassical economics and strategic management schools. While the former places emphasis on trade success and measures competitiveness with such indices as comparative advantage, real exchange rate, export, import and growth indices, the latter is centered around firm's structure and strategy employing such indicators as cost, efficiency and productivity.

The peculiarity of the Nigerian economic environment which is majorly a monolithic one, neglecting other viable sectors which can effectively fast-track and spur catalytic economic growth and development of the nation. Nigeria's manufacturing sector is characteristically weak, uncompetitive, plagued with low capacity utilization, and its contribution to national economic growth is low and declining (contribution of manufacturing to total GDP fell from 8.4 percent in 1980 to 4.6 percent in 2005, (Malik & Teal, 2008). The sector however had progressed

in its share of GDP over the years accounting for 9.18 percent in 2017, 9.20 percent in 2018 and 9.06 per cent in 2019 (CBN, 2019).

Nigeria's ratification of the African Continental Free Trade Agreement on 7 July 2019, is a call to improving competitiveness at all fronts particularly in the manufacturing sector since it is a huge contributor to economic growth. In March 2018, the African Continental Free Trade Area (AfCFTA) was unveiled; a single market for goods and services that amongst other objectives is aimed at unlocking the potentials of the manufacturing sector, facilitating industrialization, and drive sustainable growth and jobs in Africa. Harnessing the advantages engendered by the free trading bloc will be hugely determined by how well the domestic manufacturing sector is strengthened to increase the competitiveness of its output in both the internal and international market. Nigeria being characteristically under-industrialized with low capacity utilization, needs an effective, efficient, productive and competitive manufacturing sector to foster growth among the several sectors of the economy (Obadan, 2012).

Previous discourse on the Nigerian manufacturing sector considered issues like the effect of capacity utilization on the manufacturing sector performance (Okunade, 2018), the contribution of the sector to economic growth (Adofu, Taiga and Tijani, 2015), evaluation of the linkages between the manufacturing and other sectors of the Nigerian economy (Salami & Kelikume, 2011), while some merely assessed the determinant of manufacturing growth (Onodje and Farayibi, 2020) and the impact of trade policy and economic reforms on manufacturing output (Adeoti, 2020; Osa, 2014 and Campbell & Asaleye, 2016). A few other studies focused on competitiveness in the Nigerian manufacturing sector (Adeoti et al, 2020). The focus of the study was on the role of export in advancing competitiveness in the Nigerian manufacturing sector by helping to remove constraints to manufacturing competitiveness. In all of these studies, none considered competitiveness in the manufacturing sector vis a vis other sectors of the economy. Second, none of the studies did a disaggregated analysis of the subsectors in the manufacturing with the aim of identifying those driving competitiveness of the main sector. This study intends to make up for these gaps.

In the light of the foregoing, thus, there is need to comprehensively evaluate competitiveness of the manufacturing sector in Nigeria vis-a-vis other sectors and as well as analyze the performance of the sub-sectors within the manufacturing sector with the aim of identifying the sub-sectors driving competitiveness in the

Nigerian manufacturing sector so as to consolidate on the gains from such identified sub-sectors while strengthening weaker ones.

The paper is structured as follows; while the first section of this paper is the introduction, the second x-rayed conceptual underpinnings and reviewed some selected literature and the third focused on methodological issues. The fourth section covered presentation and discussion of the empirical results while section five concludes and proffered some recommendations for policy options.

Conceptual Underpinnings and Review of Related Literature

Conceptual Underpinnings

Competitiveness is a broad multi-dimensional concept with varying components analyzed by different schools of thought using varied conceptual approaches. However, it can be relatively easy to define at a micro level to mean the ability for a firm to do better than benchmark firms in sales, profitability or market share. At the macro level, the competitiveness of a country can broadly be interpreted to refer to development or growth strategy (Lakshmanan et al, 2007). In a narrower sense, competitiveness is seen as a nation's ability to make sales of its products at a lower price and earn the same income as its competitors in the international market while at the same time sustain and expand real incomes in the long term. This definition makes use of variables such as exchange rate, remuneration of factors of production and productivity achieved through enhanced technical skills, human capital development and economies of scale (OECD 1996).

Shee (2002) adopted a three-level definition of competitiveness. First is country competitiveness which refers to how conducive or detrimental the national environment is to business. Secondly, industry or sector competitiveness relates to the collective ability for the sector to compete globally and offer potentials for growth and lastly, firm competitiveness which refers to the ability for firms to produce, design and market goods and services better than competitors.

Chesnais (1986) is of the opinion that international competitiveness of domestic economies is centred on the competitiveness of firms and industries which operate within the economy. However, Krugman (1994) categorized the definition of competitiveness into two; the market-share and productivity-based view. The former refers to competitiveness as a location's unit cost level which drives a firm's ability to export while the latter describes competitiveness as a location's

productivity levels which drives a sustainable standard of living of the citizenry. In the view of Ademola and Marshal (2018), competitiveness can be measured according to two schools of thought: i) the neoclassical economics, which emphasizes on trade success and capturing it with export or import indices, real exchange rate and comparative advantage indices; and ii) the strategic management thought, which focuses on the firm's strategy and structure, defining it to mean non-price supremacy and cost leadership, using various cost indicators, as well as productivity and efficiency to measure cost leadership, and paying particular attention to productivity (and its efficiency component), which is largely accepted to be a part of competitiveness, although not often cited in that manner in empirical studies.

The World Economic Forum (1979) Report and American Competitiveness Council (2007) Report define competitiveness as achievement of success in markets which results in sustained high rates of growth in GDP per capita of a country. According to McKee and Sessions-Robinson (1989), the firm, industry or country with the highest productivity may be adjudged most competitive. Porter (1990) upholds that the central idea around competitiveness is productivity which he defines as the value of the output produced by a unit of labour or capital which in turn depends on the quality, features and production efficiency. Porter further asserts that productivity is a major driver of national per capita income and long-term sustained increases in standard of living.

Review of Empirical Literature

In the empirical literature, authors align with either the neoclassical or strategic management views. García-Herrero et al (2014) analyzed competitiveness using neoclassical and strategic management approaches in Latin American manufacturing sector. The result indicates a decline in competitiveness in most of the countries sampled in the analysis. The observed deterioration in competitiveness was attributable to high labour costs, inadequate growth in labour productivity and appreciation of the real exchange rate. In the same vein, Lukmandono and Pumama (2018) also employed both market-share and productivity-based views to investigate competitiveness in the manufacturing sector within the framework of structural equations modelling with the objective of determining the variables which contribute to competitiveness of the manufacturing sector. The result revealed that manufacturing strategies, competitive strategies, technology indicators and partnerships which constitute both market share and

productivity-based variables rightly contribute to competitiveness in the manufacturing industry.

Lakshmanan, Chinngaihlianand Raj, (2008) in an analytical paper explored various parameters of manufacturing competitiveness in the Indian economy using both neoclassical and strategic management variables. The paper observed that India is losing competitiveness as a result of reduced labour productivity and increased input and material costs. Ocampo et al (2017) in a study in the manufacturing sector of Honduras also applied a mixed approach to propose an integrated method to estimate an index of manufacturing competitiveness in apparel maquiladora firms in Honduras. Findings from the study confirmed the multidimensional and multivariate nature of manufacturing competitiveness.

Gatnet (2005) focused on internal and external competitiveness of the Ethiopian manufacturing sector. Findings from this study indicated that the Ethiopian's manufacturing sector competitiveness is poor. Balcerowicz and Sobolewski (2005) working in Poland, examined the Polish manufacturing sector competitiveness from 1996 –2003 using trade variables which is within the framework of the neoclassical school. The paper concludes that the competitiveness of the Polish manufacturing sector could be improved upon by privatizing and restructuring state-owned enterprises and relaxation of fiscal burden. In another twist, Nambirajan and Prabhu (2011) in a study, investigated the impact of manufacturing on domestic competitiveness in the Union Territory of Pondicherry using the neoclassical approach of measurement. The result revealed that manufacturing industries exert a positive and significant influence on competitiveness.

Cherif et al (2020) examined the relationship between domestic product market competitiveness and external competitiveness using both neoclassical and strategic management outlooks in 39 Sub-Saharan African countries and some emerging and developed economies between 2000 and 2017. The result indicates that domestic competitiveness lead to increase in external competitiveness. Similarly, Damiyano et al (2012) also applied primary and secondary data on neoclassical and strategic management variables to measure manufacturing sector competitiveness in Zimbabwe. The result of the analysis show that the competitiveness of the Zimbabwean economy is very encouraging.

Kuźmiński, et al (2020) in a two-stage analysis, employed strategic management variables to investigate manufacturing competitiveness in the Polish manufacturing sector using the chi-square independence test. Findings revealed that

competitiveness was improved when manufacturing firms strategically maintained unchanged relationship with suppliers.

Dou et al (2021), examined competitiveness in the manufacturing sector of the G20 countries from 2008 to 2018 using panel regression analysis to determine the variables that affect manufacturing competitiveness. The paper revealed that intellectual property significantly exerts a positive influence on manufacturing competitiveness in developed countries while transport services exerts the most significant effect in developing countries and information technology significantly affect competitiveness in every country irrespective of the level of development however, the effect is more noticeable in developed countries.

Methodology

Data Source

This study employed time series data sourced from various editions of the Central Bank of Nigeria (CBN) Statistical Bulletin and the World Development Indicators (WDI). Specifically, data for GDP per capita was obtained from the WDI while the others were from the CBN Statistical Bulletins. The data spanned 1981 – 2019; a total of 39 years.

Variable Definition

This study followed after Nambirajan and Prabhu (2011). The variables employed in this analysis are growth rate of Gross Domestic Product (GDP) per capita as a proxy for competitiveness, manufacturing output as percentage of GDP, service output as percentage of GDP and agricultural output as percentage of GDP. The suitability of GDP per capita growth as a proxy for productivity is well supported by literature (Porter, 1990; Krugman, 1994; Pitelis, 1998) as it is, argued that this variable represents a broad macroeconomic equivalent to total factor productivity in part and adjudged to be a good measure of economic performance.

Economic literature is replete with the positive effect of the manufacturing sector on productivity. In a productivity -competitiveness model, manufacturing is a positive determinant of productivity and by implication per capita income which make per capita income a theory-based consideration as dependent variable. According to (Pitelis, 1998), it is an empirical validation of the determinants of productivity and competitiveness where competitiveness is approximated by

productivity and the latter by per capita income. This variable is also justified by Pitelis and Antonakis, (2003) in a study which suggests that the choice of per capita income inherently accounts for the role of unemployment hence it is believed to be a better measure of competitiveness.

The relationship between competitiveness and manufacturing shares in GDP, has been confirmed by Kaldor (1966), suggesting the probability of a cumulative effect. However, Kang, (2000); Daniels, (1993); Elfring, (1989); Ochel and Wegner (1987); Gershuny and Miles, (1983); Stanback, (1979) and Fuchs, (1968), are of the opinion that the decline in the share of manufacturing and agriculture in an economy and the attendant increase in the role of the service sector is associated with an enhanced potential for growth and employment creation and overall transformation of the economy particularly as performance of manufacturing sector is contingent on the quality of services they can use, thus resulting in service innovation becoming a major source of growth in an economy (Gallouj, 2002). This is possible as pointed out by Baumol (1967) the growth rate of productivity in the manufacturing sector is comparatively higher and lower in the service industry which thus drive up the cost of services and leading to unprecedented rise in the proportion of services in GDP. Several reasons were adduced to this occurrence and notable amongst them is that first, consumers tend to increase their demand for services as income rises sometimes higher than the rise in income and the second plausible reason is attributed to the increasing role the sector plays as an intermediate input in the production process of other sectors.

Another aspect of competitiveness also explored in this analysis is the sub-sectoral competitiveness of the manufacturing sector. To this end, the contribution of the sub-sectors in the manufacturing sector were identified. Thus, the variables used in this study are as follows:

| | | |
|---|---|--------|
| Growth of GDP per capita as proxy for Competitiveness | = | Gdppcg |
| Agricultural output as percentage of GDP | = | Agric |
| Service sector output as percentage of GDP | = | Serv |
| Manufacturing output as percentage of GDP | = | Manuf |
| Log of manufacturing output | = | manuf |
| Log of oil refining | = | lor |
| Log of cement | = | lce |
| Log of foods, beverage and tobacco | = | lfbt |
| Log of textile, apparel and footwear | = | ltaf |

| | | |
|---|---|-------|
| Log of wood and wood product | = | lwwp |
| Log of pulp, paper and paper products | = | lpppp |
| Log of chemical and pharmaceutical products | = | lcpp |
| Log of non-metallic products | = | lnmp |
| Log of plastic and rubber products | = | lprp |
| Log of electrical and electronic products | = | lee |
| Log of basic metal, iron and steel | = | lbmis |
| Log of motor and vehicle assembly | = | lmva |
| Log of other manufactures | = | lom |

Method of Analysis

This study adopted the autoregressive distributed lag (ARDL) bound test cointegration and a multiple regression approach. The ARDL model is one in which the dependent variable is expressed in terms of the lagged values of the dependent variable, current and lagged values of the regressors as explanatory variables. In other words, the model is made up of both exogeneous and endogenous variables. ARDL models are important because it helps to understand a situation where the effect of a change in one variable may likely bring about a change in another with a delayed effect beyond the current period or distributed over a period of time. In this study, competitiveness is seen not to be functionally related to just the variables of interest but also to its on lagged values. In order to identify the most competitive sub-sectors in the manufacturing sector, a multiple regression was also carried out.

A generalized form of a lagged relationship is presented as follows:

$$Y_t = f(X_t, X_{t-1}, X_{t-2}, \dots, X_{t-n}) \text{-----(1)}$$

Where $t-1$ represents the lag.

An ARDL model therefore is given as:

$$Y_t = \beta_0 + \beta_1 Y_{t-1} + \beta_2 Y_{t-2} + \dots + \beta_p Y_{t-m} + \alpha_0 X_t + \alpha_1 X_{t-1} + \alpha_2 X_{t-2} + \dots + \alpha_q X_{t-n} + \varepsilon_t \text{----- (2)}$$

Where m and n are lag lengths, β_i s and α_i s are coefficients, and Y_i s and X_i s are variables, ε_t is the disturbance term and β_i s are coefficient for short-run and α_i s are coefficients for long-run relationship.

Model Specification

The ARDL model for this study is presented in equation (3). Variable lag lengths were determined using the Akaike information criteria.

$$Gdppcg = \beta_0 + \beta_1 Gdppcg_{t-1} + \beta_2 Gdppcg_{t-2} + \beta_3 Agric + \beta_4 Serv_{t-1} + \beta_5 Manuf + \varepsilon_t$$

..... (3)

The multiple regression equation estimated to determine the competitiveness of the sub-sectors in the manufacturing sector is specified thus:

$$Lmanuf = f(lor, lce, lfbt, ltaf, lwwp, lpppp, lcpp, lnmp, lprp, lee, lbmis, lmva, lom)$$

----- (4)

All variables are expected to be positively related with the dependent variable.

Result of Empirical Estimation and Discussion

The result of the first model which measures the competitiveness of the manufacturing sector vis a vis the agricultural and service sectors in Nigeria were presented and discussed first before proceeding to determine the competitiveness of the sub-sectors in the Nigerian manufacturing sector. The focus in the latter estimation is to determine the contribution of each of these subsectors to total manufacturing output as it is argued that a more competitive sector contributes more to total output.

Unit Root Test

The unit root test results reported in Table 1 reveal that all variables are mixed order integrated (zero and one), supporting the application of the ARDL bounds testing approach to co-integration in this study.

Table 1: The augmented Dickey-Fuller test results for stationarity (Unit root test)

| Variable | Stationary (levels) | Stationary (1 st differences) | Status |
|----------|---------------------|--|--------|
| Gdppcg | -4.183*** | -10.088*** | I(0) |
| Agric | -2.581 | -5.129*** | I(1) |
| Serv | -1.571 | -5.104*** | I(1) |
| Manuf | -1.463 | -7.718*** | I(1) |

Source: Author's computation p values of coefficients: ***p < 0.01, **p < 0.05 and *p < 0.1

Bounds test

The bounds testing procedure was carried out using the F-test for the joint significance of coefficients of the lagged variables in the ARDL model. In this, the

null hypothesis of no co-integration is tested against the alternative hypothesis of co-integration. The study used the Akaike Information Criteria (AIC) and Schwartz-Bayesian Criteria (SBC) for the ARDL model lag length selection. The results of the bound test are presented in table 2.

Table 2: Bound Test Results

| F-statistic value | Significance level | Bound critical Values | |
|-------------------|--------------------|-----------------------|------|
| | | I(0) | I(1) |
| 2.560 | 10% | 2.72 | 3.77 |
| | 5% | 3.23 | 4.35 |
| | 2.5% | 3.69 | 4.89 |
| | 1% | 4.29 | 5.61 |

Source: Author's computation

The decision rule using the bound test is to compare the value of the F-statistics with the critical lower and upper bound values of the F-statistic. If the computed value is lower than the lower bound critical values at 5 percent, accept the null hypothesis of no cointegration and if it is higher than the upper bound, the null hypothesis is rejected and it is concluded that there is cointegration among the variables. If on the other hand the critical F-Statistic lies between the lower and upper bound values, the test is declared inconclusive.

Since the computed F value of 2.560 (Table 2) is lower than the lower bound I (0) critical values at all levels of significance, the study accept the null hypothesis and conclude that there is no cointegration. This thus guarantees the use of the ARDL model.

ARDL Estimation

In examining the impact of lagged values of growth of GDP per capital and service sector output, agricultural output and manufacturing output on competitiveness, proxied by growth of GDP per capita, the study obtained the following ARDL estimates;

Table 3: ARDL estimation using growth of GDP per capita as dependent variable (2, 0, 1, 0) aic

| Variable | Coefficient | t-statistics |
|----------------|-----------------|--------------|
| Gdppcg(-1) | 0.1630 | 1.04 |
| Gdppcg(-2) | 0.2973 | 2.03 |
| Agric | 0.1915 | 0.84 |
| Serv | -0.5047 | -1.83 |
| serv(-1) | 0.4397 | 1.83 |
| Manuf | -0.1684 | 0.72 |
| _cons | 1.5426 | 0.09 |
| <hr/> | | |
| F(6, 30) | = 5.16 (0.0010) | |
| R-squared | = 0.5079 | |
| Adj. R-squared | = 0.4095 | |
| DW | = 1.78 | |

Source: Author's computation

The estimates in table 3 show that a unit change in the first lag of Gdppcg growth is associated with a 0.163 unit increase in growth of Gdppcg on average, ceteris paribus, although this increase is not statistically significant. However, a unit change in the second lag of Gdppcg is associated with a 0.297 unit increase in Gdppcg on average, ceteris paribus at the 10 percent significance level. This implies that sustained competitive outputs reflects more on the general wellbeing of the citizenry.

Although agricultural output is found to positively impact Gdppcg, the impact is statistically insignificant. The table also showed that a unit change in the current value of service is associated with a 0.5047 unit decrease in Gdppcg on average, ceteris paribus at 10 percent significance level. While the current value of service sector output exerts a repressive effect on competitiveness, a one-unit lag in Service raises competitiveness by 0.4397 unit on average.

Our main interest lies in the coefficient of the manufacturing sector. The estimate showed that on average, the manufacturing sector has no significant impact on Gdppcg. Specifically, a unit change in manufacturing output is associated with a 0.1684 unit decrease in Gdppcg, ceteris paribus and statistically insignificant. In other words, the output of the manufacturing sector is about the least competitive of the three sectors considered. While agriculture contributes 0.1915 units to

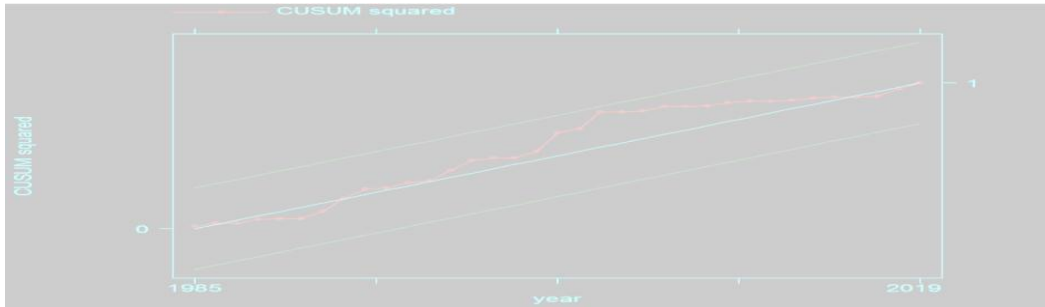
competitiveness, the service sector contributes 0.5047 (though depressive) to competitiveness.

This finding has many implications and fundamental among them is that the output of the Nigerian manufacturing sector is not competitive at all when internal comparison is done with other sectors which also implies that external competitiveness of the sector may also be compromised. Many studies have actually confirmed the importance of the manufacturing sector as an engine of growth in both developed, emerging and least developed economies (Nambirajan and Prabhu, 2011; Signé, 2018; Yaw et al., 2016; Rodrik, 2012, 2016; Dou et al, 2021)). This result also points to the fact that an uncompetitive manufacturing sector will hamper some of the benefits engender by the Africa Continental Free Trade Area which includes the establishment of a single market for “goods” and services by allowing the free movement of people and investment, creation of a continental customs union to streamline trade and hence attract long-term investment. The endorsement of the treaty establishing the AfCFTA was believed to be critical for growth and create employment for Africa’s teeming 1.27 billion population. One way to tap into these advantages is by producing highly competitive products from sectors that can spur sustainable and inclusive growth of which the manufacturing is one.

The R-square of 0.5079 and the F-statistic of 5.16 (0.0010) for model significance imply that the regressors in the model are adequately able to explain Gdppcg. The Durbin Watson statistic shows that there is no evidence of serial correlation.

Stability test

The cumulative sums (CUSUM) graph in Fig. 1 show that the coefficients in the short run, lies within the 5 percent critical limits and indicates stability in the coefficients over the sample period.



Source: Author's computation

Diagnostic Test

The table below shows diagnostic test carried out in the model.

Table 4: Diagnostic test results

| Test for: | Diagnostic Test | p-value | Status |
|--------------------|----------------------------|---------|-----------------------|
| Autocorrelation | Breusch-Godfrey LM test | 0.3149 | No serial correlation |
| Heteroskedasticity | White's test | 0.5893 | No heteroskedasticity |

Source: Author's computation

The results presented above indicate that the estimated ADRL model has passed the major econometric diagnostic tests as shown by the Breusch-Godfrey and White's test for autocorrelation and heteroscedasticity respectively. The results show the absence of serial correlation and the error term are homoscedastic.

In furtherance of the analysis of domestic competitiveness in the Nigerian manufacturing sector, a multiple regression analysis was carried out to determine the contribution of each of the subsectors in the manufacturing sector to manufacturing output. Having established the stationarity status of the variables (table 5), result of the estimated model is presented in table 6.

Unit Root Test

The unit root test results reported in Table 5 reveal that all variables are stationary at order I (1).

Table 5: The augmented Dickey-Fuller test results for stationarity (Unit root test)

| Variable | Level | 1 st Difference | Level of integration |
|----------|--------|----------------------------|----------------------|
| Lmanuf | -0.134 | -4.512*** | I(1) |
| Lor | -1.430 | -6.476*** | I(1) |
| Lce | 0.254 | -5.986*** | I(1) |
| Lfbt | -1.085 | -4.375*** | I(1) |
| Ltaf | 0.913 | -4.255*** | I(1) |
| Lwvp | -0.678 | -4.700*** | I(1) |
| Lpppp | 1.030 | -4.126*** | I(1) |
| Lcpp | 1.601 | -3.664** | I(1) |
| Lnmp | 1.725 | -4.437*** | I(1) |
| Lprp | 1.321 | -4.552*** | I(1) |
| Lee | 0.136 | -5.408*** | I(1) |
| Lbmis | 0.584 | -4.993*** | I(1) |
| Lmva | 0.780 | -3.593** | I(1) |
| Lom | 0.145 | -3.878*** | I(1) |

Source: Author's computation *p* values of coefficients: ****p* < 0.01, ***p* < 0.05 and **p* < 0.1

The results above necessitated the estimation of the manufacturing sector equation in their first differences. The estimates are presented in table 6.

Table 6: Manufacturing Performance Estimates

| Variable | Coefficient | t-statistic | p-value |
|---------------|-------------|-------------|---------|
| Lor | .0103116 | 3.05** | 0.005 |
| Lce | .0579602 | 12.70*** | 0.000 |
| Lfbt | .3044529 | 3.99*** | 0.001 |
| Ltaf | .1852869 | 3.97*** | 0.001 |
| Lwwp | .2172024 | 3.27*** | 0.003 |
| Lpppp | .2978581 | 4.58*** | 0.000 |
| Lcpp | -.2899652 | -2.63** | 0.015 |
| Lnmp | -.1937852 | -2.02* | 0.055 |
| Lprp | .414522 | 1.94* | 0.064 |
| Lee | -.018379 | -0.66 | 0.513 |
| Lbmis | -.2445492 | -1.70* | 0.102 |
| Lmva | .0296695 | 1.39 | 0.177 |
| Lom | .2135096 | 4.84*** | 0.000 |
| _cons | .0041891 | 1.56 | 0.132 |
| F(13, 24) | = 569.10 | | |
| Prob> F | = 0.0000 | | |
| R-squared | = 0.9968 | | |
| Adj R-squared | = 0.9950 | | |
| DW | = 2.400965 | | |

Source: Author's computation p values of coefficients: *** $p < 0.01$, ** $p < 0.05$ and * $p < 0.1$

Table 6 show that the various sub-sectors in the manufacturing sector contribute in varying patterns and direction to manufacturing output. The estimates show that other than the electrical and electronics and the motor vehicle & assembly sub-sectors, all other variables are statistically significant at different levels of significance. The estimates also showed that the Oil Refining, Cement, Food, Beverage & Tobacco, Textile, Apparel & Footwear, Wood & Wood Products, Pulp, Paper & Paper Products, Plastic & Rubber products, Motor vehicles & assembly and Other Manufacturing sub-sectors contributed positively to the performance of the manufacturing sector; whereas, the Chemical and Pharmaceutical Products, Non-Metallic Products, Electrical & Electronics and the Basic metal, Iron & Steel sub-sectors adversely affect the manufacturing sector. It should be noted that the Cement sector predominantly contributed positively to the sector with Motor vehicles & assembly contributing marginally to the manufacturing sector.

The R-square of 0.9968 and the F-statistic of 569.10 (0.0000) for model significance imply that the regressors in the model are adequately able to explain the performance of the manufacturing sector. The Durbin Watson statistic shows that there is no evidence of serial correlation.

Conclusion and Recommendation

The foregoing suggests that the internal competitiveness of the Nigerian manufacturing sector is far from optimal to benefit from the gains the AfCFTA engenders. One of the objectives of the AfCFTA is to boost competitiveness at the enterprise and industry level through exploitation of opportunities for continental market access, scale production and better reallocation of resources. This therefore is one reason why intra-country trade capacity must be strengthened by overhauling the manufacturing sector. The ratification instrument for the AfCFTA has been submitted by 54 countries in the African Union which suggest that intra-Africa trade will only be beneficial to the most competitive economies. The results of this analysis clearly show that the Nigerian manufacturing sector is least prepared for the gains from AfCFTA. To a great extent, the manufacturing sector cannot spur growth by itself if the infrastructure conducive for efficient production is in deficit. It may be necessary to examine in a future study the factors mitigating against competitiveness of the Nigerian manufacturing sector.

It is also pertinent to note here the performance of each of the sub-sectors in the Nigerian manufacturing sector. Some of the sub-sectors did very well while some others didn't do so well. It may be important to improve on the impressive reports posted by some of the sectors while strengthening the capacity of those with unimpressive results and turn our comparative advantages to competitive advantage.

The study therefore recommends that the manufacturing sector must be exhaustively re-engineered to be more productive and competitive in order to effectively harness the benefits of the AfCFTA. This can be done by identifying prospects and challenges in the sub-sectors that drive competitiveness.

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