Manufacturing Sector Performance, Exchange Rate Volatility and Inclusive Growth In Nigeria (1981-2015)

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Abstract

The effects of the recent global economic crisis on Nigeria have reaffirmed the urgent need for the diversification of the economy. Although, no country is immune to such global crisis, the over-reliance on oil export revenue by Nigeria exposes her exchange rate and economy excessively to external shocks. Therefore, there is the need to conduct a research of this nature to examine Nigeria's exchange rate sensitivity. This study employed Neo-Classical theory with financial intervention using Cobb Douglas growth model in assessing the impact of manufacturing productivity, exchange rate volatility on inclusive growth in Nigeria using the time series data from 1981 to 2015. The study investigates the long run agriculturally driven economic inclusive growth using Johansen Co-integration test and Normalized Co-integration. This study found out there is a long run relationship between these variables. While manufacturing sector exact more long run effect on per capita income.

Introduction

The Nigerian economy slowed down from 7.4% growth in 2011 to 6.6% in 2012. The oil sector continues to drive the economy with average growth of about 8.0% compared to 0.35% for non-oil sector (Omoh, 2013). The Central Bank of Nigeria in its annual reports emphasized that during the 1960s and early 1970s, manufacturing activities were positively growth and value added per worker was at par with, if not higher than that in other African countries (CBN, 2010) During this period the share of manufacturing in GDP nearly doubled from less than 5 percent to 8 percent and on that trend many people believed that the country was on a path to industrialization. The manufacturing sector plays a catalytic role in a modern economy and has many dynamic transformations. In any growing economy, the manufacturing sector is a leading sector in many respects. It creates investment capital at a faster rate than any other sector of the economy while promoting wider and more effective linkages among different sectors (Ogwuma, 1995). In terms of contributing to the Gross Domestic Products, the manufacturing sector is recognized, but it has been overtaken by the services sector in a number of countries, including Nigeria.

An important dilemma in international finance is the exchange rate puzzle. This issue is important because exchange rate fluctuations are likely, in turn, to determine economic performance in relation to firms' performance among others. It is a dilemma because of its randomness. The volatility and unpredictability of exchange rate is due to the confluence of

the factors that affect it (Anoruo *et al*, 2006; Benita and Lauterbach, 2007; Hanias and Curtis, 2008). As such, the issue of exchange rate fluctuations is controversial and has been a subject of much debate. A large number of studies and articles addressed the issue both theoretically and empirically and found different results, which have made the debate further controversial. The traditional view is that fluctuations in exchange rates affect relative domestic and foreign prices, causing expenditures to shift between domestic and foreign goods (Khan *et al*, 2010; Benita and Lauterbach, 2007; Betts and Kehoe, 2005). The new view is that relative prices are not much affected by exchange rate fluctuations in the short-run (Cheong, 2004).

In general, when a currency depreciates it will result in higher import prices if the country is an international price taker, while lower import prices result from appreciation. The potentially higher cost of imported inputs associated with exchange rate depreciation increases marginal costs and leads to higher price of domestically produced goods (Kandil, 2004). Furthermore, import-competing firms might increase prices in response to foreign competitor price increases to improve profit margins. The extent of such price adjustment depends on a variety of factors such as market structure, the relative number of domestic and foreign firms in the market, the nature of government exchange rate policy and product substitutability (Fouquin *et al*, 2001; Sekkat and Mansour, 2000).

Most Nigerian manufacturing companies depend on imported inputs in the form of equipment, plant and machinery and other materials and given the fact that bulk of the country's foreign earnings is from oil earnings which provides 95.0 per cent of the foreign exchange earnings according to the 2013 world fact book of the United State Central Intelligence agency, thus revealing the extent of the vulnerability of these companies to swings in the exchange rate which is greatly affected by fluctuations in the oil price in the international market. Mohammad (2010) notes that the risks associated with volatile exchange rates are major impediments for countries such as Nigeria that attempt to develop through export expansion strategy and financial liberalization. Besides, Chong and Tan (2008) hinted that the impact of exchange rate fluctuations on economic fundamentals is substantially great if an economy does not provide possible tools in reducing currency risk in its market place which unfortunately, is the case in Nigeria. They further argued that exchange rate fluctuations have a catalytic effect on various parties as well as countries.

One of the most dramatic events in Nigeria over the past two decades was the devaluation of the Nigerian Naira with the adoption of a Structural Adjustment Programme (SAP) in 1986. A cardinal objective of the SAP was the restructuring of the production base of the economy with a positive bias for the production of agricultural exports. The foreign exchange reforms that facilitated a cumulative depreciation of the effective exchange rate were expected to increase the domestic prices of agricultural exports and therefore boost domestic production. Significantly, this depreciation resulted in changes in the structure and volume of Nigeria's exports and imports. However, the volatility, frequency and instability of the exchange rate movements since the beginning of the floating exchange rate raise a concern about the impact of such movements on Nigerian manufacturing companies.

Nigerian manufacturing sector has remained underdeveloped and is not showing significant growth despite the implementation of Structural Adjustment Programme (SAP). According to

Delude (1999), apart from objectives not realized, exchange rate policy and management under Structural Adjustment Programme (SAP) have left some issues unresolved and/or created some distortions in the economy, one of which is deindustrialization. A close look at the relative contribution of manufacturing production to Gross Domestic Product (GDP) before and after SAP shows that SAP, indeed, triggered a shrinking of the manufacturing sector in Nigeria. In 1980, manufacturing accounted for 8.4% of Gross Domestic Product (GDP). This relative share rose to 9.9% in 1983, and was still 8.7% in 1986 (CBN, 2010b). But, with the adoption of SAP, the manufacturing sector's relative share in GDP began to fall and reached a low of 5.29% in 1989 and fell further to 5% of the GDP in 1997 (CBN, 2010b). However, since enthronement of democracy in 1999, the contribution of the sector's GDP increased slightly to 9.6% in 2007 but fell to 7.7% in 2012 (NBS, 2012). Apart from structural rigidity, poor quality of labour force, high interest rate, corruption etc. (Delude, 1999) can be responsible for the poor performance of the sector; exchange rate volatility is also a major factor that affects its performance.

2. Summary of Gaps in Literature

Years	Authors	Objective of Study	Data	Results	Critiques
2015	Emmanuel O. & Saliu W.	To examine the hazards of the manufacturing sector and Economic growth in Nigeria from 1981-2015	Secondary data from 1981-2015	The results reveal the negative relationship manufacturing sector performance and economic growth in Nigeria	
2014	Ibukun C. & Saliu.	To asses an empirical analysis of the relationship between inclusive growth and its deteminance from 1981-2014	Secondary data from 1981 to 2014	The findings reveal that inflation and population growth has a positive relationship with inclusive growth while FDI and capital has a negative relationship with inclusive growth in the short run.	
2013	Ozunmba B. & Anayochukw O.	An assessment of the sectoral performance and inclusive growth in Nigeria.	Secondary data from 1990-2013	Manufacturing shows a positive significant relationship between with inclusive growth	

				however, agriculture and science	
Years	**Authors**	**Objective of Study**	**Data**	**Results**	**Critiques**
2007	Gajanan & Malhotra	To measure the capacity utilization and its determinants on the Indian economy	Secondary data from 1979 to 1996	They found that capacity utilization rates were higher in earlier time period, dropped in the mid-80s and started rising in the early 90s.	Insufficient data
2002	Yucel and Kurt		Primary Data Jan. 2000 – October 2002	Exporter companies were more exposed to business risk than non-exporter companies	Small sample size
1999	Kin	estimated a model of economic capacity utilization and its determinants	Secondary data	The evidence from U.S manufacturing showed that capital expansion not accompanied by market growth and higher materials and capital prices contributed to lower capacity utilization	
1997	Carrado & Mattay	how capacity utilization can impact on economic growth using the non-parametric tool of correlation analysis		Correlation of 0.9 existed between annual changes in the real output of goods and the index of capacity utilization for manufacturing.	Correlation result is unreliable since it only examined the strength of relationship

					not its impact

3. Stylized Facts

The growth of Nigeria per capital income oscillates between upward and downward trend from 1981 to 2013. This indicates an unstable inclusive growth behaviour and uncertain welfare state in the county (see Figure 1). Manufacturing sector's productivity of Nigeria roses slightly from 1980s except sudden increase in 1990 and fell in 1991. The sector's productivity increases at increasing rate from 2000 till 2013. However, per capita income was insignificantly low until 2000, after which it express steady rise in the most of the periods till 2015 (see Figure 2).

There was no definable relationship between the sectors output and inclusive growth (that is per capita income) until the turn of the 21st century when both of them experienced simultaneously increase.

Figure 1: Treads of Manufacturing capacity utilization and per capita income growth rate

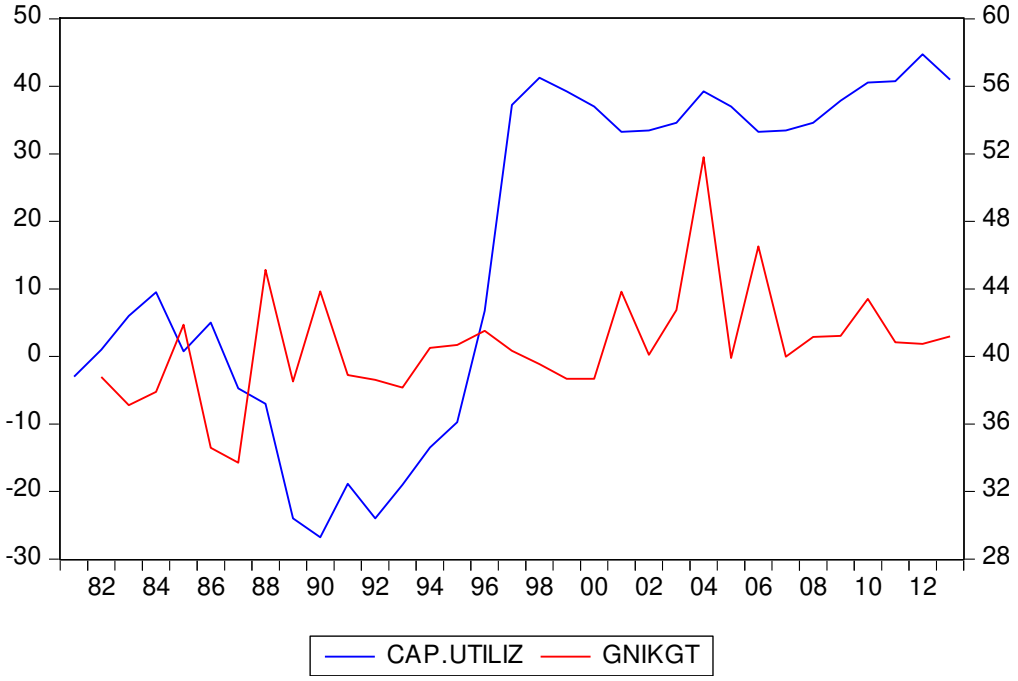
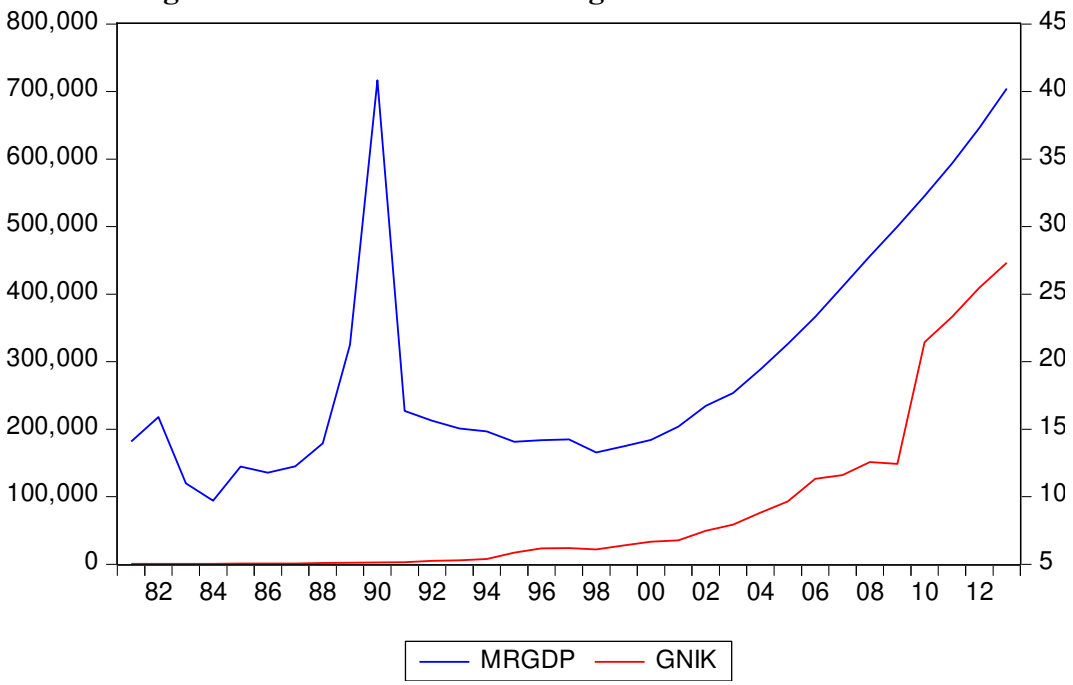


Figure 2: Trend of Manufacturing GDP and GNIk



4. Estimation and Discussion of Results

Stationarity Test

The results of the Augmented Dickey Fuller (ADF) unit root test shows that all the variables are stationary at first difference. Tables 1 show the results of the stationarity test in summary and the order of integration using ADF test.

Table 1: Augmented Dickey Fuller Unit Root Test and Order of Integration

Variables	T-Statistic Value	5% Critical Value	Remark	Order of Integration
d(lgnik)	-5.395330	-2.960411	Stationary	I(1)
Lgnik	0.049678	-2.957110	Non-Stationary	I(0)
d(lmrgdp)	-4.958226	-2.960411	Stationary	I(1)
Lmrgdp	-1.163859	-2.957110	Non-Stationary	I(0)
d(lMCap.utliz)	-3.834376	-2.960411	Stationary	I(1)
LMCap.utiliz	-1.170480	-2.960411	Non-Stationary	I(0)

Source: Authors Computation from Eviews 8.0

A variable is stationary when the absolute value of adjusted t-Statistic Value is greater than the absolute value of 5% Critical Value. All the variables were non-stationary at level, they were

first differenced once, and they become stationary. This implies that all the variables are order I(1) series. Thus, Johansen Co-integration Test can be conducted.

Co-integration Test

The co-integration test establishes whether a long-run equilibrium relationship exist among the variables of interest.

Test of co-integration Hypothesis:

H_0: $\delta = 0$ (No Co-integrating equation)

H_1: $\delta \neq 0$ (Co-integrating equations)

Unrestricted Cointegration Rank Test (Trace)

Sample (adjusted): 1983 2015
Series: GNI MRGDP MCAP

Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.501686	31.13124	29.79707	0.0349
At most 1	0.158727	8.145925	15.49471	0.4499
At most 2	0.071335	2.442223	3.841466	0.1181

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

Table 2 Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.501686	22.98532	21.13162	0.0271
At most 1	0.158727	5.703701	14.26460	0.6515
At most 2	0.071335	2.442223	3.841466	0.1181

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level

Table 1 presents the Unrestricted Co-integration Rank Test (Trace), the trace statistic (31.13124) is greater than 5% critical value (29.79707) hence, reject the null hypothesis of no co-integrating equation and accept the alternate hypothesis of co-integrating equations. To confirm this, the p-value of the null hypothesis from the trace table (0.0349) is less than 0.05. Therefore, reject the null hypothesis and accept alternate hypothesis. But accept the null hypothesis of "At most 1" and conclude that the model consist of one co-integrated equation. Therefore, using the unrestricted co-integrating rank test (trace), there is one co-integrating equation.

Another way to check for the presence of co-integration is the use of Unrestricted Co-integration Rank Test (Maximum Eigenvalue). Here, the Max-Eigen statistic (22.98532) is greater than 5% critical value (21.13162). Hence, reject the null hypothesis of no co-integrating equations and accept the alternate hypothesis of the presence of co-integration. Also, the p-value of the null hypothesis from the Max-Eigen table (0.0271) is less than 0.05. Therefore, reject the null hypothesis and accept the alternate hypothesis. But accept null hypothesis of "At

most 1" and conclude that one co-integrated (see Table 2). Therefore, using the unrestricted co-integrating rank test (Max-Eigen), there is one co-integrating equation.

Therefore, concluded that both unrestricted co-integrating rank test (Trace) and unrestricted co-integrating rank test (Max-Eigen) confirmed the presence of co-integrating equations. Hence, there is a long run relationship between the dependent variable (lGNIk) and the independent variables (MCapUtiliz, MGDP).

Normalized Co-integration

Table 3 Normalized Co-integration Result

Normalized cointegrating coefficients (standard error in parentheses)		
LGNIK	LMRGDP	CAP_UTILIZ
1.000000	-1.703871	-0.201174
	(0.41694)	(0.01445)

Source: Authors Computation from Eviews 8.0

The estimates of the normalised co-integrating vector generated by the co-integration test as shown in Table 3, indicated a long run effect of manufacturing sector domestic productivity (MGDP) and the other interacting variables on Per capita GDP. The related t-statistics are reported in parenthesis below each coefficient. The existence of a unique co-integrating vector here implies that equilibrium relationship exists among the co-integrating variables and that no matter the fluctuation in the short run; these variables have a tendency to return to this equilibrium path in the long run. In other words, given an initial disequilibrium, the co-integrating variables will not wander away from one another endlessly but will eventually return to its established equilibrium path.

From the normalized co-integrating coefficient above, it can be observed that all the independent variables (Per Capita GNI, manufacturing capacity utilisation and manufacturing productivity) were found to be statistically significant given their t-statistics. Manufacturing Sector Productivity and manufacturing capacity utilisation were negatively signed. Hence, in the long run, 1 percent increase in MGDP will leads to approximately 1.70 percent fall in per capita income while 1 percent rise in manufacturing sector capacity utilization in manufacturing sector reduce per capita income by 0.20.

Discussion of Findings and Economic Implication.

The Nigerian Manufacturing sub-sector depends excessively on importer inputs. Its performance therefore, depends on the cost and availability of foreign exchange needed for the importation of raw materials, spare parts and machinery with much reduced foreign exchange earnings in the 1990s, brought about by the substantial fall in crude oil prices, the capacity of Nigeria local industries to import inputs declined sharply with a corresponding fall in manufacturing output. During the 1990 to 2001 period, manufacturing output declined, on annual average by 0.4 percent, attributable to the negative growth rate recorded in 1993

(20.4%), 1994 (0.9%), 1995 (5.5%) and 1998 (3.9%). The positive growth recorded in the other years was not sufficient to offset the negative growth.

As expected, the manufacturing capacity utilization rate moved in the same direction as output growth. From an average of 40.3 percent in 1990 and a pack of 42.0 percent in 1991, it trended downwards to 29.3 percent in 1995, rose marginally to 32.5 percent in 1996, and fell marginally to 30.4 percent in 1997, and thereafter risen continuously to 39.6 percent in 2001.

Many reasons have been advanced for decreasing capacity utilization level; these include increased cost of production, raw materials, and increased cost of borrowing which limit employment. Lack of foreign exchange to produce raw materials and general decreasing demand which occasioned an accumulation of finished goods and unfavorable changes in the tariff system.

Policy Recommendation

Manufacturing output should be encouraged by the government through policy packages such as tax holiday and other helpful concessions in order to enhance manufacturing output in the country. Also, that financial authority in Nigeria specifies guidelines that will increase credit accessibility for investment in the manufacturing sector. More emphasis should be placed on technical education in Nigeria so as to strengthen the country's industrial base thereby enhancing manufacturing output. That strategy is put in place to increase the participation of the private sector in the economy. The industrial policy implementation is made consistent enough to impact appropriately on inclusive economic growth in Nigeria.

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