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By Anna, N. Tizhe, Umar, S.S & Idris Abubakar

University of Benin

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Impact of Trade Liberalization on the Nigerian Manufacturing Sector

Anna, N. Tizhe [α], Umar, S.S [σ] & Idris Abubakar [ρ]

Abstract- The study examines the inter-relationship between trade liberalization and manufacturing performance in Nigeria. Time series data sourced from Central Bank of Nigeria (CBN), National Bureau of Statistics (NBS) and Manufactures' Association of Nigeria (MAN) for the period 1980 to 2010 were utilised. Short-run error correction model (ECM) and long-run (OLS) regression techniques was employed to derive the estimates. The findings from the study indicate that the adoption of trade liberalization strategies in Nigeria have negatively affected the country's manufacturing sector, This shows that trade openness has brought about negative total factor productivity in Nigeria as manufacturers often respond to uncompetitive ease in trade restrictions by outright closures, reduction in production, and sometimes, relocation to neighboring countries. However, empirical evidence suggests trade liberalization increases Nigeria's manufacturing output when total value of manufacturing output was used as measure of performance, although was not significant at the conventional test levels. Additionally, the incidence of the Dutch Disease syndrome was found to adversely affect Nigeria's manufacturing sector performance measures employed in this study, and result aptly support the resource-curse hypothesis. Moreover, foreign direct investment contributes positively to Nigeria's manufacturing value-added, whereas it serves as a drag on total manufacturing output of the country. While real exchange rate negatively and significantly affect manufacturing sector's incremental value-addition to production in the long run, the impact on overall total output was found to be positive and significant, thus reinforcing the axiom that exchange rate can affect the allocation of resources in an economy. Results suggest that increases in tariff positively and significantly boost production value-addition in both our specified short-run error correction model (ECM) or long-run (OLS) model. Lastly the coefficient of the error correction was negative and less than one (1), indicating a stable return from short-run disequilibrium to long-run equilibrium over the period.

I. Introduction

Nigeria, like many other developing countries has engaged in a number of economic reforms and negotiations aimed at promoting industrialization. At the regional level, trade reforms are significant components of the Economic Community of West African States (ECOWAS) negotiations. Trade liberalization and poverty reduction initiatives have been reflected in strategic and developmental plans in the country. Several arguments have been advanced for such reforms because of the impact on industrial manufacturing sector.

While some studies (Dollar 1992; Sachs and Warner 1995 and Edwards 1998) claimed that there is a positive (either direct or indirect) correlation between openness and growth, others such as (Rodriguez and Rodrik, 1999) conclude that there is little systematic evidence of a good relationship between trade regime and growth. Such studies conclude that the reforms have negative impact on economic growth. However, the volume of literature on the positive relationship between trade liberalization and economic growth reforms has continued to grow, but as Malhotra has argued, that there is no convincing evidence that trade liberalization is automatically or always associated with economic growth, let alone poverty reduction (Malhotra, 2004).

Nigeria experienced a policy shift from import substitution industrialization strategy (ISIS) to export promotion (EP), under the structural adjustment programme (SAP). This was because ISIS had failed to achieve set industrialization and growth objectives. Some factors were identified as hurdles to growth of the manufacturing sector. These hurdles include, corruption, lack of the rule of law and transparency, bureaucratic red tape, and inefficient factor and product markets as constraints to manufacturing development. Others point to the phenomenon of the "Dutch Disease" in which resource-induced rent-seeking behavior crowds out economic activities in manufacturing. The availability of good infrastructure such as water, electricity, roads, and fuel is important for industrial development. Poor infrastructures often result in higher production costs.

In Nigeria, manufacturers have had to provide such facilities by themselves. Thus, they, become uncompetitive with firms in countries where infrastructures are excellent. It is not strange, therefore, that a developing country like Nigeria has traditionally been wary of implementing trade liberalization measures and has resisted the opening up of its economy out of fear of marginalization of local manufacturing industries. But things have changed in recent years, as the government has employed far reaching policy reforms including liberalization of the markets to outsiders, mainly out of the requirements of adjustment conditionalities. From 1986 there was a radical shift in

Author α: Department of Economics and Statistics, University of Benin, Benin City, Edo State.
Author σ: Department of statistics, Kaduna Polytechnic, Kaduna State.
Corresponding Author ρ: Department of Economics, Edo State University, Uzairue, Edo state. e-mail: idrisbakr@yahoo.com

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Nigeria's trade policy from restrictive control to a more liberal stance. This was largely as a result of inefficiencies associated with control systems and their inabilities to achieve both internal and external balances.

Faced with unfair competition, local manufacturers cried for governments' intervention to ameliorate the situation. But the emerging signals from official circles point to government's insensitivity due to a pact with World Trade Organization (WTO) trade liberalization policy in which Nigeria became a signatory over 10 years ago. While this position may be appreciated, it is necessary as a nation to acknowledge the lack of readiness to meaningfully participate in a globalized world of intense competition owing to some inadequacies created by inefficient infrastructure (for example, electricity, water, communication and transportation) and low capacity building. The trade liberalization situation has now been worsened by the recent introduction of ECOWAS Common External Tariff (CET). The Manufacturers Association of Nigeria is not comfortable with the business climate as regards the adverse effects on performance, employment and imports. In light of the issues that have trailed trade liberalization, the key research questions are; to what extent has trade liberalization been carried out in Nigeria? What are the effects of trade liberalization on the manufacturing sector? What are the effects of trade liberalization on productivity in the sector?

II. Review of Relevant Literaure

Trade liberalization is a key element in the fast-expanding globalization process. There is preponderance of evidence (Dollar, 1992; Ben-David, 1993; Edwards, 1998; Frankel and Romer, 1999; Sachs and Warner, 1995) that trade liberalization promotes higher growth rate of income and output. According to Bhagwati and Srinivasan (1999), numerous individual country studies over the past three decades suggest that "trade does seem to create, even sustain higher growth". Growth in manufacturing industries is strongly related to overall growth in the economy – although the relationship differs substantially from country to country. The link of overall growth to manufacturing sector performance has been demonstrated both in cross-country analyses and for individual countries. For example Spanu, (2003), Thirlwall (2000), and Jomo and Arnim (2007) show that development, not only by contributing to a more efficient allocation of resources within countries, but also by transmitting growth from one part of the world to another.

The idea that the trade policy regime of a country has an impact on the country's trade and growth is not new and it dates back at least to Adam Smith. Broadly, as identified by Duncan and Quang (2000), there have been three theoretical approaches to the trade and growth nexus: Neoclassical, Endogenous Growth, and the Institutional approach.

a) Theoretical Review

i. *Neoclassical Approach*

The neoclassical approach to the trade-growth nexus invokes general equilibrium models with constant or decreasing returns to scale. Moreover, it is built upon the choices of rational individuals acting solely through market. Trade patterns among countries are determined by comparative advantage, either in the form of technology differences as in Ricardian models or of resource endowment as in Heckscher-Ohlin models. The neoclassical models of international trade theory in general predict that a country will have static gains from lowering its trade barriers.

One of the most important static gains from trade liberalization predicted by neoclassical model is the increase in allocative efficiency. Since trade policy has an important impact on the transmission of international price signals, lowering trade barriers would lead to a reallocation of resources to the sector with comparative advantage. As a result, resources are used more efficiently and the welfare of the country as a whole rises. The gains from trade liberalization are - by nature of the neoclassical models - static, and trade policy like other government policies has only level effect, not growth effect a well-known prediction of neoclassical growth models in Solow (1956) and Swan (1956). However, the validity of the key assumptions on which the neoclassical approach is built has been questioned by a number of economists. For example, Rodrik (1988), and Devarajan and Rodrik (1989) argue that scale economies and imperfect competition are prevalent in developing countries. They show that under these conditions, the welfare impact of trade liberalization becomes complicated. The theoretical possibility of a welfare-reducing impact from trade liberalization in the presence of imperfect competition and increasing returns to scale has been pointed out in others.

ii. *Endogenous Growth Approach*

The dynamic gains of trade liberalization are closely linked to writings on endogenous growth: "a new growth" theory that has proliferated since the mid-1980s. Much has been made of the endogenous growth trade theory.

According to the endogenous growth theory approach, trade policy can impact on income and the long run growth through (a) scale effect; (b) allocation effect; (c) spillover effect; and (d) redundancy effect. (a) Scale effects: The integration of markets through trade can create scale effects via the integration of goods markets on flows of intangible and non-rival "knowledge capital". Examples of dynamic gains from

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trade via scale effects can be found in the models of Rivera-Batiz and Romer (1991), and Grossman and Helpman (1991a). Jones (1995) argues that scale effects are at odds with the existing empirical evidence of OECD countries. (b) Allocation effects: The static gains from the reallocation of resources in neoclassical models can be sustained and transformed into a growth effect, if the changes in the composition of national output are related to the production of accumulable factors. For developing countries, however, access to cheap imported capital goods is perhaps the most compelling mechanism linking trade and growth. Protection policies that restrict the import of capital equipment reduce real investment and lower the rate at which physical capital accumulates. As a result, the rate of long-run growth is – as commonly predicted by the endogenous growth theory – reduced, and if technical progress is embodied in capital goods, the negative impact of protection on growth will be magnified. (c) Spillover effects: Integrating world markets facilitates access to the knowledge available in other nations. Technical progress embodied in goods represents an opportunity for countries engaging in international trade to learn from trading partners. In the literature investigating the link between growth and trade via technological spillovers, the diffusion process is modeled in two main ways. It can be a non-purposeful activity where trade simply provides economies access to a world pool of knowledge that is freely available. Feenstra (1996) and Grosssman and Helpman (1990, 1991c) adopted this approach. The second approach models the diffusion as a purposeful activity in which the less developed countries can imitate technology available in the more developed countries. (d) Redundancy effects: The redundancy effect of trade policy on growth is closely related to the characteristics of knowledge. Since knowledge is a non-rival good, opening the economy can reduce the unnecessary waste of resources devoted to Research and Development from a global point of view. Increased foreign competition in Research and Development as a result of trade liberalization can eliminate redundancy in research across countries. Theoretical models in which the redundancy effect is used can be found in Grossman and Helpman (1991a) and Rivera-Batiz and Romer (1991).

The theoretical possibility that trade liberalization might have a negative effect on economic performance has been demonstrated in various endogenous growth studies. In Lucas (1988), free trade might cause a country sufficiently to move far from its steady state to become completely specialized in low-technology goods with its short-run comparative advantage, although it has a long-run comparative advantage in high-technology goods. Young (1991) shows that trade liberalization might cause the less developed countries to specialize in the production of "old" goods with little gains from learning by doing. Consequently, growth could be higher for less developed countries under autarky than under free trade, despite some static gains from trade.

iii. *Empirical Review*

Ige (2006) posited that the first-best rules of thumb that may be appropriate for the highly distorted economies are not necessarily appropriation for economies that have liberalized as much as Nigeria. He argued further that piecemeal across-the-board tariff reductions in Nigeria are not always beneficial from a welfare perspective and generally must be coordinated with export subsidy reductions to ensure welfare gains.

Bakare and Fawehinmi (2011) examined the relationship between trade openness and industrial productivity in Nigeria. Using a parsimonious error correction mechanism, the empirical results show that there is a significant relationship between trade openness and industrial productivity in Nigeria. It shows that trade openness led to an increase in export and consequently increases industrial output.

Adenikinju and Chete (2002) studied the effect of trade liberalization on the total factor productivity performance of the Nigerian manufacturing sector. This was accomplished in two stages. First, the TFP indicator was estimated at the firm level using the fixed effect model. Second, the TFP indicators so generated were regressed against trade liberalization and market structure variables. Two important findings from this research of concern to policy makers deserve amplification. The first is the relatively low productivity in the Nigerian manufacturing sector. This could be attributed to a plethora of factors, including a weak technological base and low level of capacity utilization. The second major finding from this study is that there are significant pay-offs from the policy of trade liberalization. The current policy of trade liberalization, which emphasizes lower tariffs and increasing openness of the economy, was found to be growth enhancing. Quite interesting is the role of Foreign Direct Investment in productivity growth at both firm and sectoral levels. There is a spillover effect generated by foreigners in the economy. Thus, the implementation of policies that encourage or restrict foreign ownership can be expected to have direct effects on industry performance, quite apart from the indirect effects that result from modification of the behavior of locally owned firms or changes in the size and distribution of firms.

Ogunkola et al (2006) studied the impact of trade and investment policy reform in Nigeria. Their findings suggest that these do not appear to have significantly affected the manufacturing sector. Specifically, manufacturing investment growth is positively related to manufacturing output growth but negatively associated with the sector's export and non-export growths. The trade policy reform dummy

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significantly affects manufacturing output growth while the investment policy reform dummy does not. However, manufacturing investment growth is positively and significantly influenced by its one-period lag.

Adebiyi (2002) studies the relation between trade policies and industrial growth in Nigeria, using quarterly time series data spanning 1973 and 2001. Undertaking empirical work on the relation between trade liberalization and industrial growth in Nigeria in the empirical investigation of the aggregate growth function of index of industrial production in Nigeria, he found out that there is no unique co integral relation between the index of industrial production and its major determinants. The results of the study seem to suggest the importance as well as the imperative for Nigeria to embark on comprehensive trade liberalization policies in order to accelerate and sustain industrial growth.

Bakare and Fawehinmi (2011) studied Trade Openness, Non-Oil Industrial Sector. The findings from the study show that sectors with a high component of local raw materials generally performed better than those depending on imported inputs. In this study, empirical investigation found that the unilateral trade openness of 1986 produced the sustainable impact on the non-oil industrial sector of the Nigerian economy. It was observed that public domestic investment, savings rate, capacity utilization and infrastructure have negative impacts on Nigeria's industrial performance. Their findings and conclusion support the need for the government to consolidate and maintain the credibility of the trade policies for sustainable growth and development. More progress will be achieved if the conditions needed for a deregulated trade system to work properly are set in place.

There were also mixed results emerging from three studies of trade liberalization in African countries. In Zimbabwe (Rattso and Torvik, 1998), it was found that the drastic trade liberalization implemented in the early 1990s resulted in a contraction in output and employment that was accompanied by a sharp increase in imports and a rising trade deficit. The study argues that the contraction in output was associated with de-industrialization, a development that may also have had unfavorable effects on the future growth potential of the economy.

III. Methodology and Theoretical Framework

Researchers have adopted many different empirical methods to analyze the linkages between trade liberalization and industrial performance. These different methodologies have strengths and weaknesses, and have some conceptual approaches. McCulluch and Calandrino (2001) identified three main empirical approaches used by various researchers in exploring the link between trade and industrial performance: the descriptive or qualitative approach, the data-based approach and the modeling approach. In general, most of the empirical studies carried out within the past fifteen years have concentrated on cross-country and panel data regression analyses. Only few studies have employed Ordinary Least Squares (OLS) and recently, the Computable General Equilibrium (CGE) techniques.

Ousmanou (2009) Using pre-and post-reform industry-level panel and aggregate national infrastructure data, examines the effects of infrastructure on industry productivity in Cameroon, controlling for trade variable and correcting for the likely endogeneity of infrastructure and other regressors. The empirical strategy involves, (i) estimation of production functions augmented by the infrastructure quantity and quality indicators and then derivation of industry-level productivity measures, (ii) accounting for output growth, and (iii) assessment of infrastructure impact on industry productivity growth.

Mouelhi (2007) took into account the effects of exogenous shocks and the delay of adjustment. A pooled sample of industries is used in this econometric analysis because the number of observations by industry is too small to conduct estimations separately for each different industry. About 17 observations (years) by industry are available, but not for all the variables. Moreover, two years are lost in constructing lags and taking first differences for estimations. A lag of variables as instruments to correct the endogeneity problem was used. The dynamic nature of the models and techniques used needs more observations that is why pooled sample of industries was used. Fixed effects models to check biases caused by unobserved sector characteristics or cross section specific effects correlated with performance outcomes that are fixed over time was also used.

a) Theoretical Framework

The study found Lucas (1998) human capital model as framework on which the work is based due to its emphasis on both labour and physical capital productivity enhancement. The basic idea of the model is that people divide their time between work and training. So, there is a trade-off, since when taking on training people give up part of their work income, but raise their future productivity and therefore their future wages.

Thus, the decisions concerning the accumulation of human capital depend on the dynamic features of the economy, which made it endogenous. Since human capital accumulation is the 'engine' of growth, growth will itself be endogenous as well. This model has two types of capital: physical and human capital. The fundamental equation of the model which is a portfolio equilibrium equation states that, in steady-state, the marginal product of the two types of capital must be the same.

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Lucas (1988) presents a growth model in which output is generated via a production function of the form

$$Y = AK^{\alpha}(uhL)^{1-\alpha} \quad (3.1.1)$$

Where: Y =output, A = growth of knowledge, K = capital and L = labor the variables are usually defined as $0< \alpha< 1$.The variable u is defined as the proportion of total labor time spent working, and h is what Lucas calls the stock of 'human capital.'

The production function can be rewritten in per-capita terms as

$$y = Ak^{\alpha}(uk)^{1-\alpha} \quad (3.1.2)$$

Which is a constant return to scale production function in k and uh. Capital accumulation proceeds via the usual differential equation,

$$\dot{k} = y - c - (\xi + \delta)k, \quad (3.1.3)$$

While h accumulates according to

$$\dot{h} = \emptyset h(1-u) \quad (3.1.4)$$

$$\dot{h}/h = \emptyset(1-u). \quad (3.1.5)$$

b) Model Specification

$$MANQ = \alpha_0 + \alpha_1 KS + \alpha_2 LF + \alpha_3 H + \alpha_4 OPN + \alpha_5 RER + \alpha_6 FDI + \alpha_7 DD + \alpha_8 TR + Ut \text{---------- (3.2.1)}$$

Log-Linear Model:

$$LNMANQ = \beta_0 + \beta_1 LNDD + \beta_2 LNLF + \beta_3 LH + \beta_4 LNOPN + \beta_5 LNRER + \beta_6 LNFDI + \beta_7 LNTR + Ut \text{ ---------- (3.2.2)}$$

Where:

LNMP	=	Natural Log of Manufacturing sector Performance
LNKS	=	Natural Log of Capital Stock
LNLF	=	Natural Log of Labor Force
LNOPN	=	Natural Log of Openness of the Economy
LNRER	=	Natural Log of Real Exchange Rate
LNFDI	=	Natural Log of Foreign Direct Investment
LNDD	=	Natural Log of Dutch Disease
LNTR	=	Natural Log of Tariff
LNH	=	Natural log of Human capital
LNMANQ	=	Natural Log of Manufacturing Output Index

IV. Data Presentatoion and Analysis

MODEL (I) - SHORT-RUN ANALYSIS

a) Parsimonous Error Correction (ECM)

Table 5.1: MODEL 1: Short-Run Mp with Error-Correction (ECM)

Dependent Variable: D(MP)				
Method: Least Squares				
Sample (adjusted): 1980- 2010				
Included observations: 30 after adjustments				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	-106770.7	254567.8	-0.419419	0.6794
D(KS)	4.680403	0.637210	7.345150	0.0000
D(LF)	0.101331	0.196101	0.516727	0.6110
D(H)	0.030616	0.032745	0.934977	0.3610
D(OPN)	-4392.241	7244.523	-0.606284	0.5511
D(RER)	-3726.805	12911.62	-0.288640	0.7758
D(FDI)	1.692060	0.908081	1.863337	0.0772

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D(DD)	-7657.213	9652.808	-0.793263	0.4369
D(TR)	1.992309	0.917593	2.171233	0.0421
ECM	-.0737842	0.296514	-4.140920	0.0005
R-squared	0.874379	Mean dependent var		800301.3
Adjusted R-squared	0.817849	S.D. dependent var		1370378.
S.E. of regression	584865.2	Akaike info criterion		29.65735
Sum squared resid	6.84E+12	Schwarz criterion		30.12442
Log likelihood	-434.8603	Hannan-Quinn criter.		29.80677
F-statistic	15.46765	Durbin-Watson stat		1.589486
Prob(F-statistic)	0.000000			

The short-run analysis of the relationship between manufacturing sector performance (manufacturing sector) and the independent variables as captured in the model (1) of table 5.9 specification indicated that Tariff (TR), foreign direct investment (FDI), capital stock (KS), Labour stock (LS) and human capital (H) positively impacted on the manufacturing sector. Though, in spite of the positive impact these variables on the manufacturing performance, it was discovered that they influence were not statistically significant at 5% level except capital stock (KS) tariff (TR). Other predictors; openness of the economy (OPN), real exchange rate (RER) and Dutch Disease (DD) revealed a negative influence on the manufacturing sector but non statistically significant at 5% level. The combined influence of the predictors on the manufacturing sector or its performance was documented by the coefficient multiple of determination (R-squared) which was overly high at (0.87) indicating a good fit of the model. this implies that about 87% of variation in the manufacturing sector (Performance) is explained by the variables in the model leaving 0.13 (13%) unexplained.

$$MPt = -106770.7 + 4.68KS + 0.101LF + 0.0306H - 4392.2OPN - 3726.8RER + 1.6FDI - 7657.2DD + 1.992309TR$$

$$(-0.419)\ (7.345)\ (0.516)\ (0.934)\ (-0.606)\ (-0.288)\ (1.863)\ (-0.793)\ (2.171)$$

Note that t-ratios of the parameters are in parentheses as indicated. From the above, the estimated rate of change of the conditional mean of MP with respect to KS, LF, H, OPN, RER, FDI, DD and TR one unit change in KS will make MP to increase by 4.68 while a unit change in LF will increase manufacturing performance by 3.06%. At the a priori, the relationship between KS, LF, H, OPN, FDI and TR is supposed to be positive while that of RER and DD is negative.

If all other variables are fixed, then for each unit change in LF, MP changes by 0.03 units.

The estimated co efficient of Error Correction Term (ECM) is – 0.737. This is highly significant with theoretical valid signs. This indicates that 73% of the disequilibrium in manufacturing performance is corrected in the next years. In other words, the speed of adjustment to disequilibrium in manufacturing performance in short-run is 73%, consequently whenever there is misalignment in the short run disequilibrium is appreciated within a year. The result suggests a high speed of convergence to equilibrium whenever there is a dis-equilibrating shock.

The F-statistics of 15.47 and with Durbin-Watson of 1.59 suggest good fit and without serial correlation model.

i. *MODEL1: LONG-RUN LNMP (OLS)*

Table 5.2: MODEL (2) LONG-RUN ANALYSIS

Dependent Variable: LNMP				
Method: Least Squares				
Sample: 1980 2010				
Included observations: 31				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	-77.04177	12.05948	-6.388483	0.0000
LNKS	-0.268654	0.144901	-1.854051	0.0772
LNLF	6.294461	0.937134	6.716713	0.0000
LNH	-0.600596	0.246474	-2.436752	0.0234
LNOPN	-0.550812	0.242402	-2.272307	0.0332
LNRER	-0.606325	0.191146	-3.172049	0.0044
LNFDI	0.050960	0.069126	0.737212	0.4688

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LNDD	-0.581113	0.218478	-2.659822	0.0143
LNTR	0.185099	0.095259	1.943114	0.0649
R-squared	0.990917	Mean dependent var		13.09155
Adjusted R-squared	0.987614	S.D. dependent var		2.541128
S.E. of regression	0.282803	Akaike info criterion		0.549571
Su *m squared resid	1.759510	Schwarz criterion		0.965889
Log likelihood	0.481657	Hannan-Quinn criter.		0.685280
F-statistic	300.0216	Durbin-Watson stat		1.733615
Prob(F-statistic)	0.000000			

In the above model 2, long run analysis

Capital Stock: The manufacturing sector performance responded negatively to capital stock (Ks). Theory has it that if investment per worker exceeds depreciation per worker, the change in capital per worker is positive: the capital intensity increases. But if investment per worker is less than the depreciation per worker, the change in capital per worker is negative: the capital intensity decreases. When capital and output are low, investment exceeds depreciation and capital increases. But when capital and output are high, investment is less than depreciation and capital decreases.

To maximise consumption in Steady State the economy must save until the marginal product of capital f'(k) is equal to the effective depreciation rate (δ). At which point, any further increase in saving, and hence capital, will push the marginal product of capital below the effective depreciation rate. To maximize consumption for current and all future generations, the economy should re-invest all capital income and consume all labour income. In other words, we need to write down households' intertemporal utility maximization problem (the RamseyCass-Koopmans Growth Model 4.1.15). If households are impatient to consume then it is optimal to have a level of steady-state capital which is less than the golden rule. Finally, it is never optimal to have a level of capital above the golden rule. This is because the process of capital formation is cumulative and- self feeding and it includes three inter-related stages

i. The existence of real savings and the rise in them
ii. The existence of credit and financial institution to mobilize savings and to direct them in desired channels.
iii. And to use savings for investment in capital goods.

Thus the problem of capital formation becomes two-fold-how to increase the propensity to save of the people in lower income group; and how to utilize current savings for capital formation. The major problem is that the rate of capital formation via savings mobilization and investment that will encourage the growth of output of t industries is very low, output is low and so is national income as a result per-capita-income is low, hence the propensity to save is very low and this poses a great hindrance to the rate of capital formation in Nigeria.

A one unit change in Ks holding other variable fixed will cause industrial performance to decline by 0.268. Even though it appears negative, the t-ratio is significant at 10% level, which means that in the long-run it will affect manufacturing performance positively. The *apriori* expectation is positive. Investment in capital has not only directly increase output, but also introduces positive externalities for related industrial labour force. The greater the capital stock and integration with international industries, the more investment will encourage savings, investment and economic growth has strong positive influence on manufacturing performance a high level of capital stock can strongly stimulate industrial production.

Labour force (LF) has positive and significant relationship with Manufacturing Sector Performance (MP). The rate of change of the conditional means MP with respect to LF is about 6.294, meaning that it will bring an increase in MP by about 6.294 units. This is particularly true because most of the industries in Nigeria are labour intensive. It means that the industries should embark on labour intensive projects, since it has comparative advantage than capital intensive projects.

Human capital (H) from theory is an important factor for the wealth of a nation due to its influence on the overall production of the country. Skilled labour is necessary to manage and develop them as well as to improve the quality and productivity of the existing labour. However, Nigeria is having problem with its human capital. The human development index provides a measure of human capital development (HDI) in three dimensions: income, health and education. The latest values of HDI shows Nigeria ranked 156 and with the value of 0.459 among 187 countries. The value places Nigeria in the bottom, meaning that Nigeria is considered to have low level of human development. Additionally, Nigeria is equally facing a relative high inequality, worsening the problem regarding the formation of human capital due to low value for education index of 0.457, compared to the average of 0.939 in the United State of America. Evidence shows that it has a negative relationship with manufacturing performance. The rate of change of the conditional mean MP with respect to H is about -0.600. It means that one unit change in H will bring about 0.600 decline in manufacturing performance. Human capital or in

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other words, quality of labour force or knowledge embedded in human leads to augmentation of product and economic growth in countries. Quality of labour varies and labour productivity increases with education and training. However, education and training use resources that could have been allocated to alternative uses such as consumption or investment in physical capital. The decision to increase stock of education/ training within the labour force is conceptually similar to investment in stock of physical capital. A higher saving rate in physical capital not only increases KS, but also human capital H. The same applies for higher investment in human capital.

The relative contribution of physical and human capital in output depends on share of each factor. Even though human capital is only one factor to many that derives manufacturing performance, it is very important factor for the growth process of Nigeria. The productive capacity of a country is related to the level of human capital, explaining why human formation must be considered of great importance.

Openness (OPN) has a negative relationship with manufacturing performance. The rate of change of the conditional mean MP with respect to OPN is about -0.55. A one unit change in openness will make manufacturing performance to decline by 0.55 units. With free trade, all sorts of goods will flood the market in Nigeria with limited foreign direct investment to total absent of infrastructure. The local industries, if not protected, will not be able to compete internationally. Lack of technological know- how and IT is an added disadvantage to these facts. This findings collaborates that of Adenikinju and Chefe (1987). It has been shown that in Nigeria manufacturing sector, import liberalization has a negative impact on total factor productivity growth. The reason for this was adduced to the fact that domestic manufactures are unable to compete with often high quality imported products.

Real exchange rate has a negative relationship with manufacturing performance which is according to *apriori* expectations. The rate of change of the conditional mean MP with respect to Real exchange rate is about -0.61. A unit change in Real exchange rate will bring about 0.61 increases in industrial performance. According to the theory, depreciation in exchange rate makes export cheaper and import expensive. A negative sign of real exchange rate is healthy for the growth of the economy and indeed manufacturing performance. Real exchange rate depreciation implies appreciation of the nominal exchange rate which can result in current account surplus and increased international competitiveness as it affects export. Real exchange rate depreciation as a policy can be used in the short-run as expansionary monetary policy ↑M → ↓ i → ↓E→real depreciation→more exports. In the long –run, it will lead to increase in inflation and price level which will subsequently result to appreciation of the real exchange rate. A depreciated currency means that imports are more expensive and domestically produced goods and exports are less expensive. It also lowers the price of exports relative to imports. Real exchange rate appreciation implies depreciation in nominal exchange rate which reduces international competitiveness and may lead to current account deficit. Increased real exchange rate may lead to lower Manufacturing Sector Performance (MP) because of increased import activities. An appreciated currency is more valuable and therefore it can buy more foreign produced goods that are denominated in foreign currency. It also means that imports are less expensive and domestically produced goods for exports are more expensive.

Dutch disease (DD) has a negative relationship with industrial performance. This is in conformity with the *apriori* expectation. Dutch disease impacts the economy negatively because of its rent seeking activities. The rate of change of the conditional mean MP with respect to DD is about -0.58. A unit change in DD will cause manufacturingl performance to decline by 0.58.

Tariff has positive relationship with manufacturing performance which is according to economic theory and in accordance with the *apriori* expectations. Tariff discourages imports due to imposition of tax on the items. The rate of change of the conditional mean of industrial performance with respect to tariff is about 0.185. A unit change in tariff will cause manufacturing performance to rise by 0.185.

The R-square explains 99 percent of the determinants of manufacturing performance. The F-statistics of 300.0216 shows that, all the variables are significant in explaining the variation in manufacturing performance. The Durbin-Watson statistics was 1.733615 which shows that, there is no problem of serial correlation. The Akaike information criterion shows the variables are significant.

V. Conclusions and Recommendations

The study documented that all the variables used to measure trade liberalization exhibited positive sign and have statistically significant effect on manufacturing output index in Nigerian. Therefore, given trade liberalization positive effects on industrial performance in Nigeria and with the two major objectives and variables for hypothesis testing; the foreign direct investment (FDI) and tariff were found to impact positively on the manufacturing output index in the Nigerian economy; the study concluded that there is need for another policy measure that will positively promote industrial manufacturing output in Nigeria given the non significant of the policy variables included in the model.

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