Can Trade Liberalisation Provide Solution for the Needed Capital Goods in Nigeria?[1]

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Abstract
The developing world believes that they are at the receiving end of all that is bad with trade liberalisation owing to the nature of their economies. Contemporarily, that line of reasoning has become debatable as some developed economies have turned against the concept. Nevertheless, the exchange of ideas in the form of technology proves to be vital and cannot be possible under autarky especially for a developing economy. The study, therefore, examined if trade liberalisation led to increase in the growth of capital goods importation in Nigeria employing secondary data taken from the Central Bank of Nigeria (CBN) statistical bulletin and the World Bank from 1970 to 2014. To check for long run relationship among the variables, Johansen cointegration test was adopted. The study made use of Ordinary Least Squares (OLS) estimation technique and an error correction modelling approach. The results of the study show that trade liberalisation has no significant impact on the growth of capital goods importation in Nigeria both in the long run and in the short run. Following the empirical findings, the government is advised to prioritise the importation of capitals goods by drastically reducing import duties on them or making them duty free. This will facilitate the enhancement of local production of goods that the country can produce but imports, increase productivity and ultimately reduce the high import penetration presently killing the Nigerian economy.
Keywords: Trade Liberalisation, Capital Goods, Error Correction Modelling, High Import Penetration, Nigeria.

1. Introduction
The controversy associated with trade liberalisation since the concept was introduced remains unabated. This stems from the fact that many argue that it affects economies differently. Interestingly, the magnitude of how it impacts on the developing and the developed world has made trade liberalisation a topical issue. As maintained by Stiglitz (2006) that unless trade liberalisation is practised squarely, the widening gap between the developed and the developing world with regards to benefits of liberalisation will remain insoluble. At the beginning, many developing countries including Nigeria, adopted the import substitution industrialisation strategy (ISI) as a means to protect the infant industries while waiting for maturity to compete with other industries on the global stage (Kassim, 2013). Empirical and theoretical evidence from various researchers have shown that the ISI policy affected much of the developing countries adversely.

As observed by Soludo & Ogbu (2004) the major problem of economies that followed the ISI policy manifested in the form of balance of payments challenge. Moreover, other significant problems were characterised by the reason that many developing economies have markets that are too small to realise economies of scale obtainable in large markets in the developed world, hence, inward looking approach led to market inefficiency. Again, since imports are restricted, the potentials of the export sector are hampered because they cannot procure the best inputs at world prices (Santos-Paulino & Thirwall, 2004). Also, import restriction raised the costs and reduced the availability of imported inputs used in the production of goods meant for exports, thereby pushing exporters to make use of expensive and low quality locally produced inputs (Soludo & Ogbu, 2004). Besides Krugman *et al.* (2012) observed that with ISI strategy, countries draw resources away from actual or potential export sectors and for this reason a country's choice to seek to substitute for imports is also a choice to discourage export growth and ultimately the growth of that economy. Nigeria adopted the ISI policy regime for the reasons already aforementioned, although the country did not record much success as envisaged (Olaifa *et al.* 2013). Consequently, the economic downturn in 1980s caused by decline in the price of crude oil, forced the country to restructure her economy as prescribed by the International Monetary Fund (IMF) and the World Bank (Nwagbara, 2011). As noted by Edward (1993), before the restructuring was mooted, the Nigerian economy was already in a precipice. The structural adjustment programme which the country adopted in 1986 was thought to be a panacea that will solve the economic problems facing the nation. Amongst the recommendation offered by the institutional lenders was for the country to open up its borders; that is, to reduce the restriction of free flow of goods in and out of the country as never done before.
With the free flow of goods, trade liberalisation was seen to promote more efficient resource allocation in

production, as well as technological change and learning owing to the elimination of the anti-export and anti-competition bias that discouraged innovation, cost reduction and acquisition of technological capabilities (Yusuf *et al.* 2013). In the long run, any type of restrictions on imports could limit the quality and availability of technology that would have been sourced elsewhere (Dornbusch, 1992). Therefore, as exchange is encouraged rather than restricted, nations could easily acquire the goods they need. Besides, the availability of technology in the form of imported capital goods is a source of gain on why restrictive trade should be jettisoned (Dornbusch, 1992).

Nigeria remains a net importer of capital goods (i.e. heavy machineries and equipment). Since production of most of the capital goods are done by a handful of nations across the globe (Eaton & Kortum, 2001), trade liberalisation will ease their acquisition and translates to investment capital (DeLong & Summers, 1993; Alfora & Hammel, 2007). It has also been documented that countries that acquire more capital goods, increased investment in the long run (Hsieh, 2001). This could only be possible where trade restriction is minimal. As Mutreja *et al.* (2016) observed, the relative price of capital decreases when trade barriers are reduced; hence the amount of consumption capital that households have to relinquish in order to purchase a unit of investment decreases thereby leading to increase in the rate of investment in poor economies.

At present, Nigeria is faced with one of the worst periods in its economic history, struggling to move out of recession caused by the drastic fall in the price of petroleum products which is the major foreign exchange earner for the country. With astonishing import penetration which until recently has decimated the country's foreign exchange sector and the value of the naira, putting pressure on her foreign reserve, this paper attempts to unravel if trade liberalisation has increased the growth of capital goods importation in the country; increase in the import of capital goods could improve local production and could also lead to enhancement of local goods. Moreover, as observed by Eaton & Kortum (2001), a country's productivity depends on its access to capital goods around the globe. Most economies nowadays, look for better ways to engage in liberalisation of trade in order to derive maximum benefit to their own advantage. Thus, to expressly handle the argument raised in the study, it is divided into 7 sections; section 2 outlines the conceptual issues; section 3 deals with the theoretical literature; section 4 collates the empirical literature; section 5 presents the methodology; section 6 analyses the results and lastly section 7, concludes.

2. Conceptual Framework

2.1 *Trade Liberalisation*

Trade liberalisation has been defined in the literature from different perspectives. It is loosely defined as a move towards freer trade through the reduction of tariff and other barriers (International Labour Office, 2001). From this definition, it explicitly means that nations should allow for much free flow of goods and services by reducing tariffs and other obstacles that could inhibit the free flow of trade with other nations; therefore, it is an act of allowing/freeing up of a nation's trade to allow for more transactions between countries. According to Soludu & Ogbu (2004), it involved measures to minimise restrictive trade and the use of prices instead of discretionary intervention by the government. In another viewpoint, the World Bank (1987) added that the logic behind trade liberalisation is that tariffs should be as low as possible. This definition seems to capture the real meaning of liberalising trade because, no economy would like to open its borders such that there is no barrier at all for the movement of goods and services in and out of such economy in the real sense of word. Alternatively, trade liberalisation has been defined as an act to make the trade regime more neutral; it connotes a trade system that will be free of government intrusion (Shafaeddin, 2005). Trade liberalisation is seen as an important development policy (Winters, 2002), however, the upshot of the policy has led many to argue on whom had benefited more; this has to do with the division between the developed and the developing world on the concept of liberalising trade and the way it is being practised at present.

2.2 *Capital Goods*

The classification of capital goods is varied and depends on what a particular study intends to carry out. Capital goods in a common parlance are goods used to produce other goods. They are producer's durable equipment and do not include output of construction goods industry (Rosenberg, 1963). According to Acha *et al.* (2004) capital goods are stocks of physical assets produced in the past for current and future production. In other words, from this definition, capital goods are not goods for consumption purposes; rather they are goods intended to last as long as they could in the process of production. In this sense, their life span ends only through wear and tear, or more importantly through obsolescence. Following Acha *et al.* (2004) capital goods include, constructs required for production of goods and services (examples are office, buildings etc.), plant and machinery, and raw materials and components (examples are finished and partly finished products) employed in production process; hence they are not produced to directly satisfy consumption needs. For the purpose of this study, capital goods will involve only plant and machinery because they are basically the ingredient all manufacturers use to produce other goods.

3. Theoretical Framework

Many theories exist in economics literature to explain why there is need to liberalise trade. The Ricardian and Heckscher-Ohlin trade theories make a good and convincing case on the advantages of trade liberalisation[1]. This stems rightly, from the fact that, there are varied preferences and nations are endowed physically differently, hence, the need for profitable trade cannot be doubtful (Todaro & Smith, 2011). Since no two nations are perfectly alike in resource endowment and otherwise, exchange cannot take place fully where there is strong restrictions. According to Dornbusch (1992) trade liberalisation creates room for possibilities; it is a period when opportunities open up, because access to cheap inputs creates export opportunities, which carry rents and profits that can be invested in capital goods, which in turn yield further productivity gains. From the preceding text, the gains from liberalising trade cannot be overemphasized, because countries that employ imported intermediate goods and capital equipment derive benefits from their acquisition in the form of foreign knowledge which can later be exploited through imitation (Veerami, 2009). Interestingly, the knowledge spillover cannot be quantified. Trade liberalisation may also lead to increases in investment, productivity and firm performance of some industries if the right intermediate inputs are imported (Kasahara *et al*. 2008; Ge *et al*. 2011; Kandilov *et al*. 2016). As Veerami (2009) pointed out, the type of capital goods an economy imports and from where it is imported from, has an impact on its long term growth. All these could only be possible where there is greater reduction in whatever could impinge on trade between countries. As stated in Dornbusch (1992), the channels through which an economy could reap the benefit of trade liberalisation includes but not limited to the following; improved resource allocation in line with social marginal costs and benefits; it creates access to better technologies, inputs and intermediate goods; it affords economies opportunity to take advantage of economies of scale and scope; it creates room for greater domestic competition; there is always availability of favourable growth externalities, like the transfer of knowledge; it rearranges industries such that a Schumpeterian environment especially conducive to growth can be exploited. More importantly, trade liberalisation, especially, when there is substantial shedding of barriers to trade could help nations record some successes on the part of growing the economy, for the mere reason that no nation at present, can boost to have survived under autarky in the real sense of the word.

4. Empirical Literature

There are studies that provide a link between trade liberalisation and its impact on importation of capital goods. Kandilov *et al*. (2016) employed system generalised method of moments (SGMM) to analyse the connection between trade liberalisation and investment in foreign capital goods in India from 1989 to 1997. The study utilised firm level panel data and after controlling for endogeneity bias, empirical results show that investment rate in foreign capital goods increased owing to trade liberalisation. Further findings suggest that a reduction in import protection on capital goods and intermediate inputs resulted in higher firm level investment in foreign capital goods, whereas reduction in output tariffs led to lower investment. Ge *et al*. (2011) used matched Chinese and trade data set for the period, 2000 to 2006 to examine the nexus between intermediate imports and trade liberalisation in China. The study found that input tariff reductions spurred importers to increase the volume of imported inputs and capital goods. The study also found that import response to trade liberalisation significantly enhanced firm performance. Amiti & Konings (2007) applied various methods including panel fixed effects and Ordinary Least squares (OLS) to estimate the effect of trade liberalisation on intermediate inputs and productivity in Indonesia involving manufacturing firms from 1991 to 2001. The findings from the study show that reduction in tariffs as a result of trade liberalisation led to increase in productivity especially for firms that imported foreign inputs; lower output tariff increased productivity by engendering tougher import competition while on the other hand cheaper imported inputs raised productivity through learning and other effects embodied in foreign import of intermediate goods. Alfaro & Hammel (2007) adopted panel fixed effect method to investigate the relationship between equity market liberalisation and imports of capital goods in 79 countries from 1980 to 1997. The study reveals that equity market liberalisation significantly influenced the increase in importation of machinery and equipment. The empirical results further suggest that increased access to international capital, afforded economies the opportunity to enjoy the benefits embodied in capital goods. Eaton & Kortum (2001) employed Solow and Ricardian theoretical models together with different estimation techniques to assess the trade in capital goods in 34 countries comprising developed and developing economies using data from 1985. The findings from the study indicate that cross country differences in productivity are caused by barriers to trade in capital goods. Kasahara & Rodrigue (2008) examined if importing intermediate

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[1] The Ricardian theory (i.e. the comparative cost advantage theory) emphasises the advantage countries could gain if they trade in goods they have comparative cost advantage in, because no economy can produce all the goods they need while the Heckscher-Ohlin theory emphasises the intensity at which factors used in the production process are utilised since the existence of these factors differ from one economy to another – an economy will be disposed to be comparatively effective at producing goods that are intensive in the factors with which the country is comparatively well endowed (Krugman *et al*. 2012).

goods improves plant performance in Chile using data from 1979 to 1996. The study employed SGMM and other estimation techniques and found that importing foreign goods improves plant productivity. Adenikinju & Chete (2002) used panel data technique and instrumental variable (IV) approach to explore the nexus between trade liberalisation and market structure with productivity growth in Nigerian manufacturing sector from 1988 to 1990. The study found that there is low productivity in the Nigerian manufacturing sector. Other findings from the study showed that firms that used high concentration of local raw materials performed better than those that used imported import raw materials; it was also found that import liberalisation affected Nigerian growth rate adversely. DeLong & Summers (1991) applied OLS estimation to explore the relationship between equipment investment and economic growth in 61 countries from 1960 to 1985. The sample comprised high productivity countries and another containing both high and low productivity countries. The results of the study indicate that there is a strong connection between investment in equipment and economic growth within the period under review. The empirical findings further suggest that the relationship is causal and that higher equipment investment drives faster growth. In addition, Caselli & Wilson (2004) used pseudo maximum likelihood and OLS to determine the cross country differences in composition of equipment investment in a group of countries (about 30 to 40) in a balanced and unbalanced dimension from 1970 to 1995. Empirical results show among others that the composition of capital goods has the potential to account for some of the large differences in total factor productivity across nations. Frensch (2010) employed seemingly unrelated regression and OLS within a gravity model framework to investigate the impact of trade liberalisation on a set of imported goods versus the volume per imported goods on 36 countries from 1992 to 2004. The findings from the study reveal significant extensive import margin effects of liberalisation on intermediate and capital goods compared to consumer goods. The study concluded that trade liberalisation assists emerging economies to engage in import led growth policies which comprised importing intermediate and capital goods, and paying for such imports with exports of final goods produced with the imports.

The incentive for this study stems from the observation that there is scant literature on the impact of trade liberalisation on the importation of capital goods in Nigeria. Many studies paid attention mostly on the link with economic growth and other numerous variables (Edward, 1993; Santos-Paulino, 2002; Akinlo & Aremo, 2013; Ayinde, 2013; Asongo *et al.* 2013; Echekoba *et al.* 2015 et cetera). This study, therefore, will derive its strength in determining if the adoption of trade liberalisation provided a solution to the problem of acquisition of scarce capital goods (e.g. plant & machinery) in Nigeria.

5. Data and Methodology

This study will analyse the relationship between trade liberalisation and capital goods (especially plant and machinery) importation in Nigeria. Secondary data taken from the Central Bank of Nigeria (CBN) Statistical bulletin for 2011 and 2014, and the World Bank development indicators for 2016 will be employed for the analysis. The study period covers 1970 to 2014. Growth rate of capital goods (GCG) will serve as the dependent variable while exchange rate (EXR), import price index (MPI), inflation rate (INF), growth rate of exports (GEXP) and trade openness (TOP) will be used as the independent variables. Since liberalisation cannot stand on its own as a variable, this paper will use trade openness as a proxy for trade liberalisation –how open an economy is, could to some extent determine how liberalisation has affected it with respect to the inflow and outflow of goods and services. Besides, the inflows of capital goods might augur well for the economy if it is properly deployed in areas where they are needed. All the variables will be expressed in percentages (.i.e. in logarithm) because it is easier to interpret the coefficients owing to percentage effect (Wooldridge, 2013). In addition, the data series in this study are annual time series and to avoid getting a spurious result, they will be subjected to unit root test to assess their status. As observed by Greene (2012, p.986) 'data characterized by unit roots has the potential to lead to serious errors in inferences'. Therefore, this exercise shall be done using Augmented Dickey-Fuller (ADF) test propounded by Dickey & Fuller (1979) and Phillips-Perron test credited to Phillips & Perron (1988) in their classic articles. In the ADF test, the effect of serial correlation occurring in the error term is taken care of by inclusion of the lagged difference of the dependent variable (Gujarati & Porter, 2009). The ADF test is shown in equation (1);

$$\Delta \Omega_t = b_1 + b_2 t + \theta \Omega_{t-1} + \sum_{i=1}^{m} \alpha_i \Delta \Omega_{t-i} + \varepsilon_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(1)$$

where Δ is the difference operator, Ω_t is the variable of interest; b_1, b_2, θ and α_i are parameters to be estimated; t is the time trend; ε_t is an error term with pure white noise characteristics. The null hypothesis using ADF states that a series has unit root (i.e. H0: α =1) as against the alternative (H1: $\alpha < 1$). Alternatively, the Phillips-Perron unit root test employed the nonparametric method to deal with the problem of serial correlation in the disturbance term instead of the lagged difference of the dependent variable as applied by Dickey and Fuller. After conducting the stationarity test using the two approaches as aforementioned, and all the variables

turn out to be stationary (i.e. shows there is no unit root problem; and integrated of order one), this might lead to examining if there is equilibrium/long run relationship between the variables. First and foremost, the Engel & Granger (1987) cointegration technique will be applied. Thereafter to make the result robust, the Johansen cointegration test credited to Johansen & Juselius (1990) will also be used. If the tests detect evidence of cointegration, an error correction model (ECM) will be employed. In addition, post diagnostic tests will be carried out to ensure the regression results are valid; the tests include checking for heteroscedasticity, serial correlation, the normality of the error term and stability (CUSUM test will be applied). Furthermore, heteroscedasticity and autocorrelation-consistent standard errors will also be used as it appears strong in handling the problem of serial correlation as well as heteroscedasticity where it is present in regressions (Gujarati & Porter, 2009).

This study is built around the Keynesian aggregate demand theory and Cobb-Douglas production function for a small open economy. The Keynesian theory incorporates the national income and help to explain how GDP growth could be sustained in periods of shocks to any economy. In the theory, the national income is determined by the spending pattern of economic agents in an economy (ie. $Y = C + I + G$) for a closed economy (Snowdon & Vane, 2005). In an open economy net exports arise from the difference between exports and imports of an economy with the rest of the world and represent the net expenditure from abroad on domestic goods and services which gives income to domestic producers (Mankiw, 2010). If the value of exports is higher than that of imports net exports will be said to be positive but if otherwise, it will be negative; that is if import value is greater than export value. Given net exports to be exports minus imports $(NX = X - M)$ the national income identity for a small open economy becomes:

$$Y = C + I + G = (X - M) \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(2)$$

where Y = output, C = consumption, I = investment, G = government purchases, X = exports and M= imports. These are all output demand components.

Thirwall (2000) stated that exports differ from other components of demand in three aspects; specifically, exports is the only demand component that emanated from outside the system, it is the only demand component that pays for import requirement for growth and lastly, it permits the importation of productive resources (capital goods) used for domestic production. On the other hand, the Cobb-Douglas production function explained the economy's production of goods and services, and the distribution of national income between capital and labour (Mankiw, 2010).

Specifically, output further follows the aggregate Cobb-Douglas production function as

$$Y = A_t K^\alpha L^{1-\alpha} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(3)$$

where α and $1-\alpha$ are weights reflecting the share or contribution of capital and Labour. A_t is technological progress (current available technology), K is capital stock while L is labour (Mankiw, 2010). An increase in equation 3 is expressed as:

$$\frac{\Delta Y}{Y} = \frac{\Delta A}{A} + \frac{\alpha \Delta K}{K} + \frac{(1-\alpha)\Delta L}{L} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(4)$$

Equation 4 is simply that the Cobb-Douglas production function in a form of relative changes shows that the growth of aggregate output (i.e. the left-hand side of the equation) is a function of the contribution of changes in total factor productivity (i.e. the first expression at the right-hand of the equation), changes in the weight contribution of capital (i.e. the second expression at the right hand of the equation) and changes in the weighted contribution of labour (i.e. the last expression at the right hand of the equation). Technological advancement is certainly not possible under autarky (absence of trade). Thus, the openness of nations through trade liberalisation influences the growth of output, and the growth of capital stock results to investment spending. These can be expressed as:

$$\frac{\Delta Y}{Y} = f(TO, FDI) \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(5)$$

The expression in equation 5 means that the growth of output is a function of trade openness and foreign direct investment just to keep it simple. Output growth as shown in equation 5, includes the various demand components in equation 2. Following the conventional demand functional relationship,

$$CG = f(M_p) \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(6)$$

Equation 6 signifies that import of capital goods (CG) is also a function of import prices (M_p).

Thus equation 6 can be written as;

$$\frac{\Delta CG}{CG} = f\left(\frac{\Delta M_p}{M_p}\right) \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(7)$$

Furthermore, equation 7 can only be possible as a country trades with other countries. Considering the economy as a small open economy as earlier assumed, therefore:

$$\frac{\Delta CG}{CG} = f\left(\frac{\Delta M_p}{M_p}, TO^\beta\right) \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(8)$$

Let β be the marginal contribution of openness to trade which is greater than or equal to zero and less than or equal to one $(0 \leq \beta \leq 1)$ Thus, trade openness (TO) in equation 8 is expressed to increase the growth of capital goods. The stationarity test (i.e. unit root test) will be carried out on equation 9 which is a modification of equation 8 above;

$$GCG_t = \alpha + \beta_1 TOP_t + \beta_2 \ln EXR_t + \beta_3 \ln MPI_{t-1} + \beta_4 \ln INF_{t-1} + \beta_5 GEXP_{t-1} + \mu_t \dots\dots\dots(9)$$

where ln is natural log; α represents the constant; β_1 to β_5 are parameters of interest that will be estimated; $t-1$ is the previous value of the concerned variable; μ_t is an uncorrelated error term with zero mean and constant variance.

6. Empirical Results and Analysis

All the variables in equation 9 were tested for unit root, first using ADF approach.

Table 1. Augmented Dickey-Fuller Unit Root Test

Variables	ADF test statistic(at first difference)	Order of integration
GCG	-7.457037 (-2.931404)*	I(1)
INFR	-6.832187 (-1.948686)*	I(1)
TOP	-9.044772 (-1.948686)*	I(1)
MPI	-6.631512 (-1.948686)*	I(1)
GEXP	-8.190009 (-2.931404)*	I(1)
EXR	-5.295681 (-2.931404)*	I(1)

Author's computation. Figures marked * show MacKinnon critical values for the rejection of the null hypothesis at 5% level of significance.

As shown in Table 1, all the variables are integrated of order one (i.e. they became stationary after first difference. To complement the ADF test, the Phillips-Perron unit root test is shown in Table 2 below.

Table 2. Phillips-Perron Unit Root Test

Variables	ADF test statistic(at first difference)	Order of integration
GCG	-7.467541 (-2.931404)*	I(1)
INFR	-12.66514 (-1.948686)*	I(1)
TOP	-8.996223 (-1.948686)*	I(1)
MPI	-6.630720 (-1.948686)*	I(1)
GEXP	-6.222200 (-2.931404)*	I(1)
EXR	-5.299213 (-2.931404)*	I(1)

Author's computation. Figures marked * show MacKinnon critical values for the rejection of the null hypothesis at 5% level of significance

The Phillips-Perron test confirms the ADF test that all the variables are integrated of order one (I(1)); hence the order of integration gives a hint that there may be a long run relationship between the cointegrating variables. First, the Engel & Granger cointegration test was carried out on equation 9 and the results shown in Table 3.

Table 3. Cointegration Test on the Residual of Equation 9

Augmented Dickey-Fuller Test Statistic	-5.661160 (-2.622585)*** (-1.949097)** (-1.611824)*
Phillips_Perron Test Statistic	-7.213758 (-2.619851)*** (-1.948686)** (-1.612036)*

Author's computation. (a). Figures marked ***, **,* are the 1%, 5% & 10% critical values in that order.(b). Figures not in parenthesis are the test statistic of the unit root method applied

The results in Table 3 show that at level, the residual of equation 9 is stationary. To make the result robust, the Johansen cointegration test was also performed.

Table 4. Johansen Cointegration Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None*	0.563079	102.2350	95.75366	0.0166
At most 1	0.501128	66.63080	69.81889	0.0875
At most 2	0.351123	36.72833	47.85613	0.3605
At most 3	0.228879	18.13032	29.79707	0.5564
At most 4	0.148600	6.954215	15.49471	0.5830
At most 5	0.000852	0.036666	3.841466	0.8481

Author's computation. (a). Single asterisk (*) denote rejection of the null hypothesis at 0.05 level.

(b).Double asterisks (**) show Mackinnon-Haug-Michelis (1999) p-values. (c). Trace test show at least 1 cointegrating equation at 0.05 level.

As shown in Table 4 the Johansen cointegration test buttresses the Engel & Granger test that there is a long run equilibrium relationship amongst the variables in equation 9. The trace test shows that there is at least one cointegrating equation. Following this validation, the result of the long run estimates is displayed in Table 5.

Table 5. Results of the Long Run Estimates of Equation 9

Variable	Coefficient	HAC std. error	t-Statistic	P-value
Constant	-12.24748	1.547367	-7.915046	0.0000**
TOP	0.005845	0.004781	1.222340	0.2291
LOGEXR	0.040099	0.099701	0.402196	0.2291
LOGMPI(-1)	-0.326134	0.131394	-2.482114	0.0176**
INF(-1)	-0.555245	0.119203	-4.657960	0.0000**
GEXP(-1)	0.804033	0.099241	8.101788	0.0000**
R2		0.983965	F-statistic	266.3560
Durbin-Watson statistic		1.677718	Prob(F-statistic)	0.000000

Authors computation. A double asterisks (**) denotes statistical significance at 5% level of significance.

The coefficient of trade openness (TOP) a measure of trade liberalisation has a positive sign in the long run and is statistically insignificant at 5% level as shown in Table 5. This result shows that TOP has no significant impact on the growth of capital goods in Nigeria within the period under review. As observed by Ulaşan (2012) without sound policies and institutions, many countries will not benefit from trade liberalisation. Besides, the coefficient of exchange rate (EXR) is also not statistically different from zero. This suggests that EXR has no significant effect on the growth rate of capital goods as noted in this study. On the other hand, in the long run, holding every other variable constant, a percentage increase in a lag of import price index (MPI(-1)) will on average lead to 33 per cent fall in the growth rate of capital goods per annum. The same goes for a lag of inflation and a lag of growth rate of exports which appeared statistically significant at 5% level. When all other variable is held constant, in the long run, a lag of inflation (INF (-1)) will on average lead to a reduction in the growth rate of capital goods. The negative sign captures the dilemma the country has been experiencing. Higher inflation working through the mechanism of automatically depreciating the naira makes it very difficult for local manufacturers to acquire the needed capital goods –this is also amplified by the fact that so much naira will have to be exchanged in order to buy any foreign currency especially the dollars, Euros and Pounds. The one period lag of export growth (GEXP (-1)) has a positive sign and in the long run, if all other variable is held constant, a percentage increase in the variable will on average lead to 0.80% increase in the growth rate of capital goods.

Table 6. Results of the Short Run Error Correction Model of Equation 9

Variable	Coefficient	HAC std. error	t-Statistic	P-value
Constant	0.013488	0.074741	0.180468	0.8578
D(TOP)	-0.000344	0.006799	-0.050619	0.9599
D(LOGEXR)	0.330724	0.208251	1.588102	0.1210
D(LOGMPI(-1))	0.337102	0.208748	1.614872	0.1151
D(INF(-1))	0.005052	0.004124	1.225189	0.2285
D(GEXP(-1))	0.579861	0.203550	2.848734	0.0072**
ECM1(-1)	-0.774383	0.171612	-4.512395	0.0001**
R2		0.510103	F-statistic	6.247483
Durbin-Watson statistic		1.903161	Prob(F-statistic)	0.000144

Author's computation. A double asterisks (**) denotes statistical significance at 5% level of significance

Table 6 shows the error correction model results. In the short run result, TOP, acting as a proxy for trade liberalisation is statistically insignificant just like in the long run, however, the main area of interest is the error correction term (ECM (-1)) which shows the speed of adjustment towards long run equilibrium. The coefficient of the one period lag of the error correction term is statistically significant at 5 % level and is negative as expected. This indicates the presence of a long run association amongst the variable in the model. This study shows that about 77% of any short run disequilibrium between the growth rate of capital goods and its independent variables consisting of trade openness used as a proxy for trade liberalisation, inflation lagged one period, import price index lagged one period, exchange rate and growth rate of export lagged one period is corrected in the long run per annum.

Table 7. Results of the Diagnostic Test

Test	Estimated statistic	p-value
Breusch-Godfrey Serial Correlation LM Test	(F-stat) 0.507433	0.6065
Breusch-Pagan-Godfrey Heteroscedasticity Test	(F-stat) 1.121361	0.3696
Ramsey RESET Test	(F-stat) 3.195298	0.0825
Normality Test	(JB-stat) 0.791775	0.6730

The representation in Table 7 shows that the model is valid. The null hypothesis of no serial correlation, no heteroscedasticity and no misspecification was not rejected at 5 per cent level. Moreover, the result also indicates that the null hypothesis that the residuals are normally distributed was not rejected. The stability test conducted using the CUSUM test shows that the model is also stable (see Appendix).

7. Conclusion

Nigeria belongs to the group of countries termed developing nations and as such is faced with myriad of economic challenges owing to the nature of her economy. With trade liberalisation, it is argued that the country could take advantage of the benefits inherent in the policy. Interestingly, it remains indisputable that no country in the contemporary world can boast of surviving under autarky in the real meaning of the word. The aim of this study is to investigate if trade liberalisation influenced the growth of capital goods importation in Nigeria. The study period covered 45 years (1970 – 2014) using annual data sourced from the Central Bank of Nigeria and the World Bank. The empirical result from the study has shown that trade liberalisation (trade openness was used as a proxy) did not increase the growth of capital goods in Nigeria –the coefficient was found not to be statistically significant. This goes to show that there may be other underlying challenges facing the economy that made trade liberalisation not to work in the direction envisaged by this study. The Nigerian government should create policies and programmes that should target industrialisation; this can be done through giving local manufacturers the leverage to import specifically capital goods (embodied only in plant and machinery). The success of some countries in South East Asia should be something the Nigerian government ought to emulate sincerely. Industrialisation of some of the South East Asian nations began with the imports of capital goods and these imports were given preferential treatment. Ultimately, this led to home grown technology such that these countries now compete strongly with nations from whom the capital goods where imported from. On this note, the Nigerian government is advised to prioritise the importation of capital goods and also they should make it possible for producers to import by lowering the import duties/tariffs on them or completely making import duty free. This, when sincerely and vigorously implemented will facilitate the enhancement of local production of goods that the country can produce but imports, increase productivity and ultimately reduce the high import penetration presently killing the Nigerian economy.

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Appendix
CUSUM STABILITY TEST
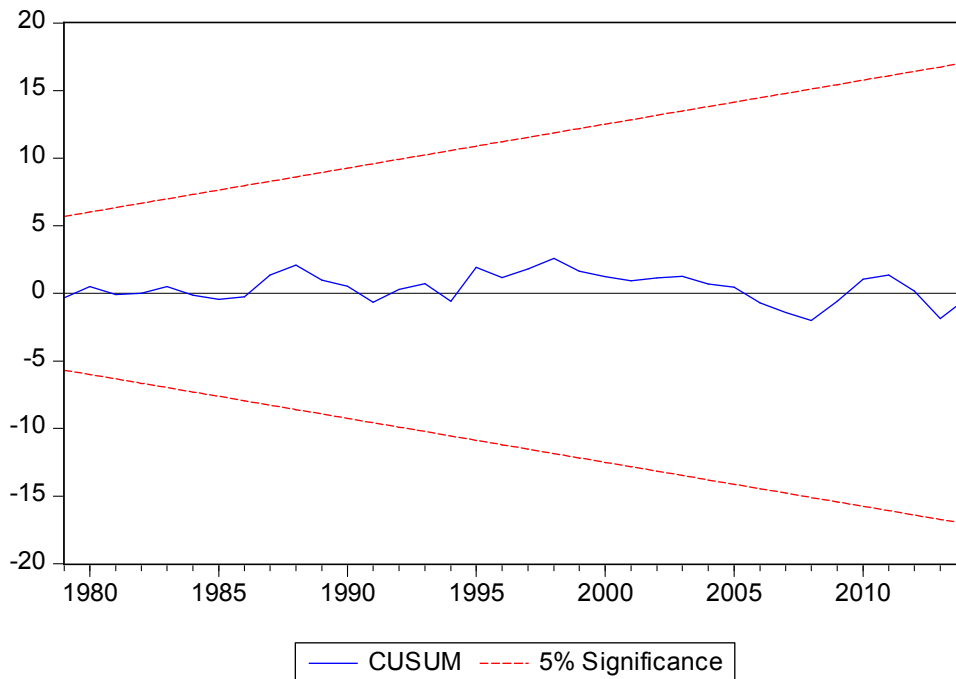
RESIDUAL TEST FOR NORMALITY
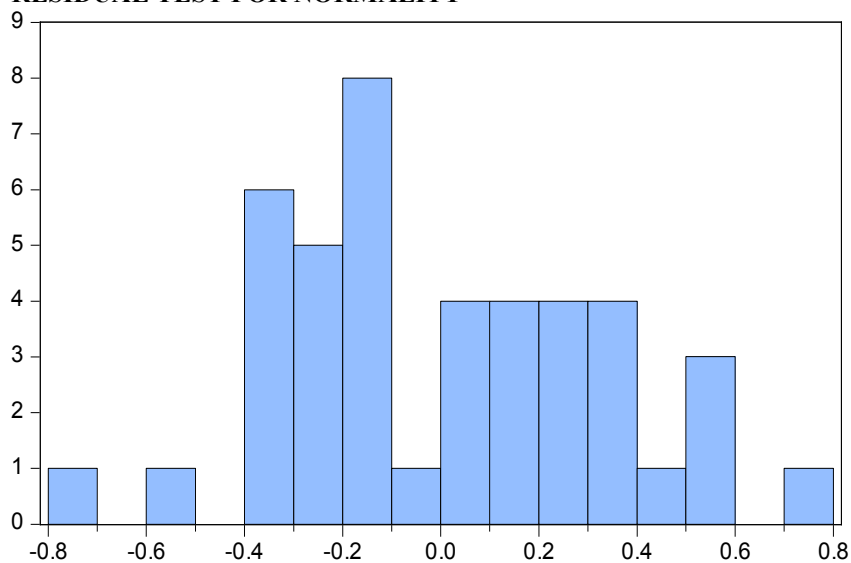
Series: Residuals	
Sample 1972 2014	
Observations 43	
Mean	-2.32e-17
Median	-0.043309
Maximum	0.723559
Minimum	-0.722615
Std. Dev.	0.326559
Skewness	0.152930
Kurtosis	2.409771
Jarque-Bera	0.791775
Probability	0.673083