Import Penetration, FDI Inflows and Non-Oil Export Performance in Nigeria (1981-2012): A Cointegration and Error Correction Analysis.

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Abstract

The paper investigates the effects of import penetration and FDI inflows on the performance of Nigeria's non-oil exports in the period from 1981-2012 using the methodology of ARDL (Bounds test) approach to cointegration and error correction analysis. The analysis indicates that import penetration impacted positively on the performance of Nigeria's non-oil export in the short run, though its long run impact was negative. The short run and long run impacts of FDI on non-oil export performance were not statistically significant. Further evidence from the analysis is that currency depreciation positively impacted the performance of Nigeria's non-oil export in the long run, but its short run impact was not significant. The paper recommends some amount of control of the composition of imports to ensure that there is preponderance of industrial inputs needed for local production over finished products, as well as reduction in tariffs on imported raw materials and technologies utilized in domestic production, to boost domestic output of goods and services, enhance their qualities and hence, enhance the volume and value (attractiveness, competitiveness) of the country's export items in foreign markets, and central bank's timely intervention in the nation's foreign exchange market to prevent over appreciation of the domestic currency, setting its exchange rate at levels consistent with improved export trade.

Keywords: Non-oil Export Performance, Import Penetration, Foreign Direct Investment, Nigeria.

JEL; F 14; F 21.

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1. Introduction

Over the years since the exploitation of crude oil in commercial quantities in Nigeria in the 1970s, which saw the gradual displacement of agriculture as the main stay of the nation's economy and the neglect of the non-oil sector, there have been calls on the Nigerian government to diversify its economic base in order to reduce its dependence on the oil sector of the economy and develop the non-oil sector in view of the potential benefits the non-oil sector holds, and also in consideration of the fact that crude oil is a wasting asset whose price is affected by the vagaries in the international crude oil market, thus engendering uncertainty in the economy.

Nigeria is at present, Africa's top oil producing country. The country is highly dependent on earnings from the oil and gas sector, which accounts for over 95% of her total export earnings and 70% of government revenues. The sector, according to official figures from the National Bureau of Statistics (NBS) is at present, the largest recipient of FDI inflows in the country (Oaikhenan and Aigheyisi, 2014). Prior to the recent rebasing of her GDP by the country's National Bureau of Statistics (NBS), the oil and gas sector accounted for 40.86%, 37.01%, 32.43% of her nominal GDP 2011, 2012 and 2013 respectively. After the rebasing, the contribution of the sector to nominal GDP was 17.52%, 15.89% and 14.40% in 2011, 2012 and 2013 respectively. Its contribution to the real GDP was 10.45% in the third quarter of 2014. This went down to approximately 8.97% in the last quarter of same year. The decline in the sector's share of GDP according to the NBS was due to price and production challenges which adversely affected average daily production. The International Association for Energy Economics attributed the decline to the fact that the sector's contribution is largely revenue which does not translate into GDP in the absence of productive activities in the economy, but is mainly used for importation of consumption goods and services, which adversely affects the balance of trade (BOT) and the GDP figures (Asu, 2014; Eboh, 2015).

Until recently (the last three years) when some improvements in the non-oil sector were recorded owing to government efforts to diversify the productive base of the economy and a substantial increase in FDI inflows into the non-oil sectors of economy such as telecommunications, consumer products, construction and business services (Ernst &Young Africa, 2014), the nation's precarious dependence on the oil sector and the neglect of the non-oil sector posed serious threat to the development of her economy and tended to limit the pace of her development (Oaikhenan and Aigheyisi, 2011; Adebile and Amusan, 2011). This was partly responsible for the high rate of unemployment, poverty and other economic and social ills in the country, as well as the rising trends in import penetration rate in the country.

The non-oil sector holds the key to sustainable growth and development of Nigeria's economy, and the need to develop these sectors to drive the growth of the economy cannot be overemphasized, considering the vastness of the sector and its potential as a growth driver. The contribution of non-oil export to GDP within the period from 1981 to 2012 was abysmally low, compared to that of oil export.

This was due to the high reliance on the crude oil sector and the near-neglect of the non-oil sector. However, effort is been made by the government to diversify the economy away from crude oil to develop other sectors of the economy in order to fully harness their potentials as growth drivers.

The Export-led Growth (ELG) hypothesis underscores the relevance of export to economic growth. Countries with large export base grow more rapidly than those with thin export base. The ELG hypothesis may be modified and restated as *well diversified export base engenders growth and rapid development of an economy*. The potential of non-diversified export base to drive economic growth is limited. In other words, concentration or non-diversification of export limits or inhibits its potential to drive and sustain the growth and development of economies. Hence countries with large, diversified export base experience more rapid development than those with less diversified or undiversified export base.

Importation could be beneficial or detrimental to growth of a nation's export depending on how it is handled. Rodrik (1999, p.24 as cited in Ding, Sun and Jiang, 2013) has noted that the 'benefits of openness lie on the import side, rather than the export side'. There has been much emphasis on export promotion as a necessary ingredient for economic growth. Many countries (including Nigeria) have at various times adopted and implemented export promotion strategies to enhance their gains from international trade. However, it is also common knowledge that various countries also take steps to protect their economies from imports from other countries as a measure to prevent dumping and to protect their infant industries. The effect of import protection on domestic output and hence, on export (since the volume of domestic output is a major determinant of export volume), has been an issue of discussion among researchers. As a matter of fact, there has been a debate on whether import protection acts as *export promotion* or as *export destruction* (Dick, 1991).

Nigeria's exports can be categorized into oil and non-oil exports components. While oil export has performed credibly and impressively over the last three and a half decades, despite periodic shocks, the performance of the country's non-oil exports has been regrettably poor. The performance of non-oil exports (comprising mainly agricultural commodities, manufactures and non-oil minerals such as iron ore, coal mica, tin, columbite, etc) is affected by multiplicity of factors (internal and external) broadly categorized as demand and supply factors (Fugazza, 2004). They include elasticity of demand for the non-oil export commodities in the international market, and the ease with which the export commodity enters the foreign market, which are demand factors and, inflation rate, exchange rate, import penetration rate, foreign direct investment inflows, etc. which are supply factors. This study focuses on the supply factors affecting the performance of Nigeria's non-oil export.

The main objective of this paper is to investigate the effects of import penetration and foreign direct investment inflow on the performance of Nigeria's non-oil export. To this end, the paper shall seek answers to the following research questions:

- Does import Penetration affect the performance of non-oil exports in Nigeria?

- Do FDI inflows promote or inhibit non-oil export performance in Nigeria?

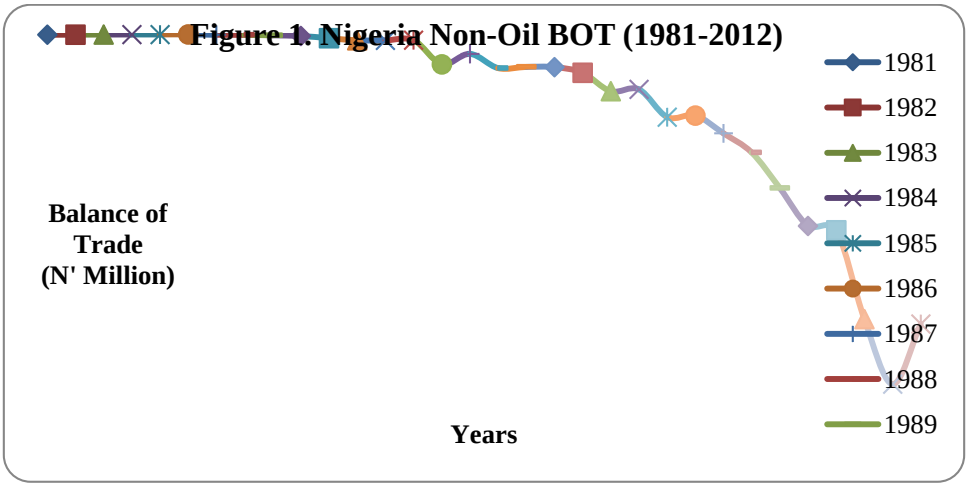
The Null Hypotheses to be tested are formulated thus:

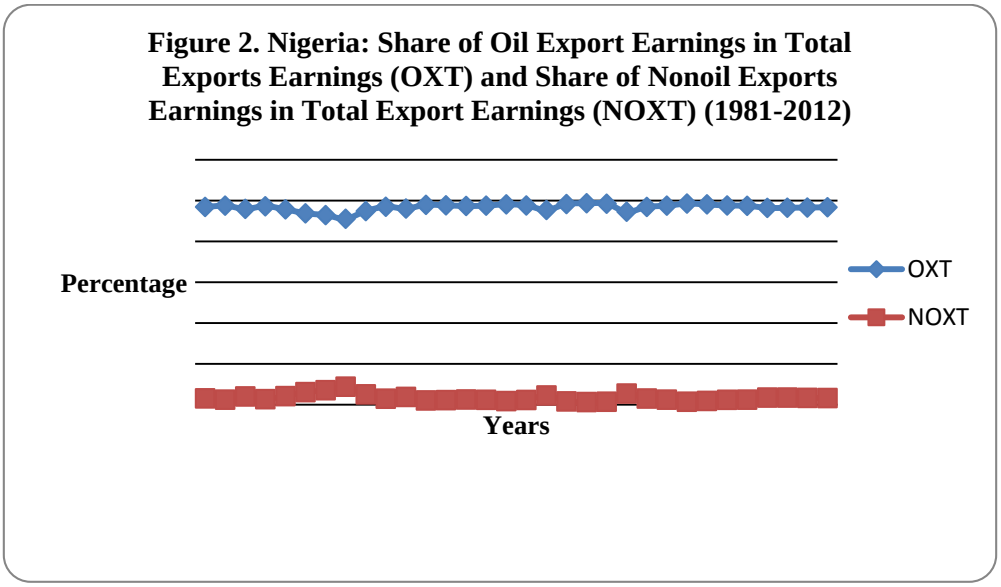
- Import penetration has no significant effect on the performance of non-oil export in Nigeria
- FDI inflows do not affect the performance of Nigeria's non-oil export.

In addition to investigate the effects of import penetration and FDI inflows on the performance of Nigeria's non-oil export, the effect of exchange rate movement shall also be investigated.

2. Statement of Problem

Official statistics from the Central Bank of Nigeria's Statistical Bulletin (2012) reveals that in the period from 1981 to 2012, Nigeria's non-oil balance of trade was in deficit in the entire period (See Figure 1). The deficits could be attributed to the poor performance of the non-oil sector, and the high level of dependence on imports. Also within the period, the share of non-oil export in total export and its contribution to GDP, compared to the share and contribution of oil export in/to total export and GDP respectively have been abysmally low, (See Figures 2 and 3 respectively).





Source: Data from Central Bank of Nigeria's Statistical Bulletin, 2013

With average contributions of 3.3 percent and 0.73 percent to total export and GDP respectively in the 1981-2012 sample period, (compared to average contributions of oil export to total export and GDP of 96.7 percent and 24.25 percent respectively), the performance of Nigeria's non-oil export has been pitiably poor. We observe in Figure 2 that the gap between the share of oil export earnings in total export earnings and that of non-oil export earnings in total export earnings is huge. Thus Nigeria's non-oil export, according to (Adenuga and Dipo, 2013) has performed below expectations casting doubt on the effectiveness of the export promotion strategies adopted by the country. This raises a red flag and constitutes serious threat to the growth prospects of the economy, especially in the face of dwindling oil prices, resulting in declining oil revenues. Bridging the gap is needful, and this entails taking conscious and deliberate steps to raise the share of non-oil exports in total exports by the ministration of relevant policy options.

3. **Evolution of Trends Import Penetration and Non-Oil Export Performance of Nigeria**

At the eve of efforts to liberalise the nation's economy as part of measures for implementation of the Structural Adjustment Programme (SAP) policies in 1986, the import penetration rate (measured as the ratio of import to foreign trade-adjusted GDP using data from the CBN Statistical Bulletin of 2013) was 5.00%. A decade later (1996) it stood at 26.05%. In 2005 it was 61.38%. It went down to 19.18% in 2012. In the same period, non-oil export earnings as percentage of GDP was 0.41% in 1986, 0.58% in 1996, 0.73 in 2005, 0.67% in 2012.

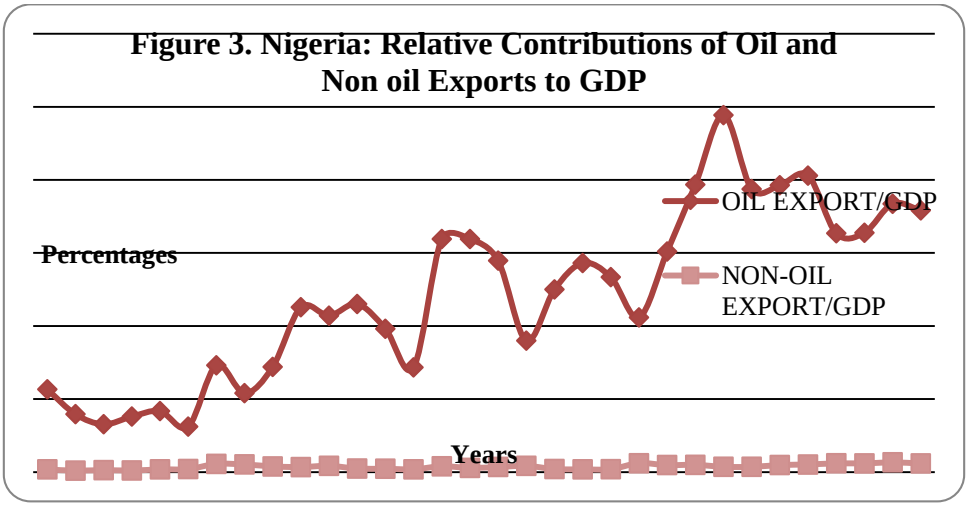
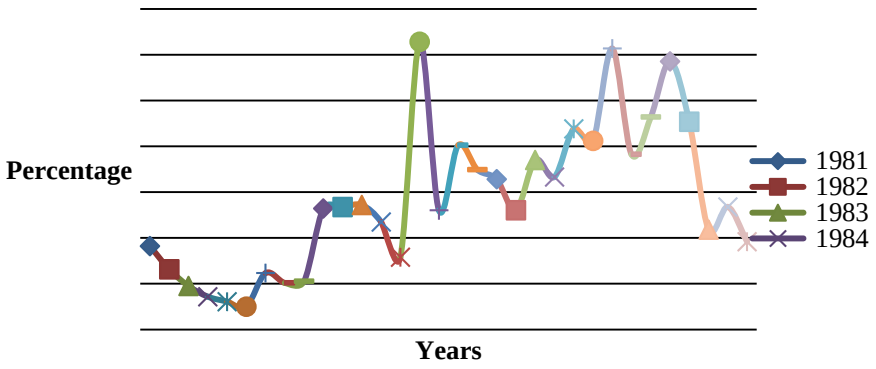


Figure 4. Nigeria: Import Penetration Rate (1981-2012)



Meanwhile the share of oil export earnings in GDP rose from 6.22% in 1986 to 31.90% in 1996. In 2005, it stood at 48.87% and then went down to 20.03% in 2012 owing to production challenges and fall in the price of crude oil in the world crude oil market.

The trends in the share of oil and non-oil exports in GDP (Figure 3) and import peneration rate (Figure 4) shows that positive relationship existed between oil export earnings and import penetartion rate in the 1981-2012 period, and suggests that oil export earnings were actually used substantially to finance importation. Also indicated by the trends is that earnings from oil export may not have been properly channeled into the development of the non-oil sectors of the economy.

4. Literature Review

4.1. Theoretical Considerations

The effects of import penetration on export performance could be categorised as output-enhancing effects and output-reducing effects. The output-enhancing effect transpires if the imported items or commodities are used to build local production capacities leading to a boost in the nation's output. Considering that output expansion is positively related to export growth according to the Vent for Surplus theory, the expansion in output leads to improvement in export performance, all things being equal. In the absence of trade resrictions, the output-reducing effects transpire if import engenders crippling of local production such that export potentials are adversely affected. Thus Importation could be seen as a double edged sword which could be engaged to boost a nation's earnings from its exports if properly handled, and if not properly handled, it could be detrimental to the peformance of a nation's export.

An article in *Economic Trends* cited in Kennedy and Thirlwall (1979) pointed out that increase in import penetration in several British manufacturing industries was associated with a substantial increase in the export-output ratio in a wide range of industries. However, Kaldor also cited in Kennedy and Thirlwall (1979) discounted any autonomous increase in export ratio and attributed the rise in aggregate export ratio to import penetration through the workings of Harrod's foreign trade multiplier. He argued that the rise in export ratio was not engendered by the increase in the import penetration rate *per se*, but by the decrease in demand for domestic (home) output (engendered by rise in the share of import in total domestic expenditure) which in turn leads to decrease in consumption and investment in successive steps until a sufficient contraction occurs in the GDP relative to export to make spontaneous increase in export-output ratio to be matched by induced increase in the import penetration rate (import-output ratio).

Kaldor predicts that increase in import ratio (that is import as percentage of GDP) is associated with reduction in the rate of growth of output, and that the rate of growth of output is inversely related to the export ratio (that is export as percentage of GDP). (In other words the lower the rate of growth of output, the higher the export ratio). These predictions provides two 'structural equations' and a reduced form relating changes in export ratio to changes in import ratio. The structural equations from the predictions are Kennedy and Thirlwall, 1979, p. 315):

$$\frac{\Delta Y}{Y} = a_1 + b_1 \Delta \left(\frac{M}{Y}\right) \qquad (1)$$

$$\Delta \left(\frac{X}{Y}\right) = a_2 + b_2 \left(\frac{\Delta Y}{Y}\right) \qquad (2)$$

Where $b_1 < 0$, and $b_2 < 0$. The negative sign on b_2 according to Kaldor is as a result of increase in export ratio (the share of export in GDP) as output (GDP) reduces.

Substituting (1) into (2) gives the reduced form:

$$\Delta\left(\frac{X}{Y}\right) = (a_2 + b_2 a_1) + b_1 b_2 \Delta\left(\frac{M}{Y}\right) \quad (3)$$

Where $b_1 b_2 > 0$. The tendency for increase in import penetration to lead to a rise in export ratio via its influence on the growth rate of output is referred to as the Kaldor's effect. The extreme form of Kaldor's hypothesis predicts that the increase in export ratio is not autonomous, but due to the adverse effect of import penetration on output through the workings of Harrod's foreign trade multiplier.

Kennedy and Thirwall agreed with Kaldor's argument that autonomous increase in import may lead to stagnation of domestic output relative to exports in growing (or developing) economies, but argued that He was rather too hasty to rule out the possibility of an autonomous improvement in export. They argued that whatever the initial condition, autonomous rise in import could engender increase in export and import ratios, though not by same amount, suggesting that the Harrod's foreign trade multiplier cannot be used to disparage the possibility of an autonomoues improvement in export performance. They also noted that

> *it is quite difficult to say from the coefficient of the reduced form equation how much of the increase in export ratio has been the automatic consequence of a growth of import penetration unmatched by any improvement in export performance and how much by a growth of import penetration that has been so matched" (Kennedy and Thirlwall, 1979, pp. 316-317).*

The improvement in export could have resulted from expansion in output (engendered partly by application of imported inputs in the production process especially in developing countries, suggesting that exports from these countries also have input contents) as suggested by the Vent for Surplus Theory postulated by Adam Smith which states that when the produce of any particular branch of industry exceeds domestic demand, the surplus must be exported and exchanged for items for which there is a demand at home, but are not readily available. If this is not done, a part of the productive labour will cease and the value of the branch of industry's annual produce will diminish. The Vent for surplus theory is corroborated by the internally-generated growth hypothesis of international trade attributed to Jung and Marshal (1985) which argues that output growth engenders export growth.

FDI theory proposes the posibility of export-promoting effect in host countries (Rahmaddi and Ichihashi, 2012). Kojima (1975) argued that FDI flows into industries in which countries have 'comparative advantage in improving productivity'. This explains why more foreign investment flows into certain sectors of an economy because those sectors promise higher returns on investment (Aigheyisi, 2014). Kutan and Vuksic (2007) identified two effects of FDI on export performance. They are the supply capacity-increasing effects and the FDI specific effects. According to them, the supply capacity-increasing effects arise when FDI inflows engenders increase in the host country's production capacity which in turn increases export supply potential. The FDI-specific effects arise because the (subsidiaries of) multinational firms (through which FDI flows into the host country) may have superior

knowledge and technology, better information about export markets, or better contacts to the supply chain of the parent market than do the local firms in transition economies. The presence of foreign firms or multinarionals increases the supply of capital required to boost output in the host country as well as enhance the competitive advantage of domestic firms (Bilsen and Maldegem, 1999; Anwar and Nguyen, 2011; Kuntluru, Muppani and Khan, 2012).

4.2. Review of Related Empirical Literature

4.2.1. Import Penetration and Export Performance

To the author's knowledge, there is yet no empirical reseach that investigates the effect of import penetration on the performance of non-oil export. However, there exists a large body of empirical literature on the effect of trade liberalization (which paves way for import penetration) on exports. Reviewing this literature will therefore not be out of place, especially when it is considered that trade liberalization and trade openness are often used interchangeably in applied works or empirical reseach, and one of the measures of trade openness is the ratio of imports to GDP (the other, and probably the commonest measure of openness being the ratio of total trade (export plus import) to GDP). Greater liberalization of trade therefore implies greater openness of the economy to international trade, less restrictions on cross border flow of goods and services, or greater integration of the economy with the global market.

Babatunde (2006) examines the impact of trade policy reforms and regional integartion on export performance in the ECOWAS sub region adopting the gravity model. The analysis indicates *inter alia* that the existence of artificial barriers to trade among ECOWAS countries negatively affects exports performance. This tends to suggest that export performance could be favoured by greater degree of trade among member countries of the ECOWAS. Babatunde (2009) also investigates the response of mechandise export to trade liberalization in sub-Sahara Africa in the 1980- 2005 sample period using the panel least squares estimation technique. The study reveals that trade liberalization stimulates export performance through increased access to imported input.

Mukhtar and Rasheed (2010) employ the technique of cointegration vector error correction (VEC) modeling and VEC Causality test to investigate the long run relationship between export and import in Pakistan in the period 1972 to 2006 using quarterly data. The analysis shows that a long run relationship exists between import and export in the country, and that the bicausal relationship exists between the two variables. It further shows that the effect of real import on real export is positive and significant. Atif, Shah and Zaman (2012) also employ the autoregressive distributed lag (ARDL) modeling and error correction modeling (ECM) to investigate the response of Pakistani export to trade openness in the period from 1972 to 2010 and finds that trade openness policies had significant long run, but insignificant short run effects on the the country's export.

Hoque (2012) investigates the impact of trade liberalization on export performance in Bangladesh using the ARDL Bounds Test Approach with annual time series data. The study finds that liberalization enhances import, but exerted statistically significant, but lower impact on aggregate exports, leading to deficits in the country's trade balance. This suggests that although the liberalization of trade engendered some degree of export expansion,imports grew faster than export and this resulted in rising trade deficits.

The US Business and Industry Council, USBIC (2013) also reveals that higher import penetration rate in the United States adversely affects the country's industrial sector engendering loss in market share in their home U.S. market to import, and decline in output and employment particularly in sectors such as broadcast and wireleess communication equipment, electro-medical devices, industrial gases etc.

Ding, Sun and Jiang (2013) investigate the effect of import competition on productivity dispersion in China using three comprehensive data sets covering the period from 2000 to 2006. The investigation reveals that import penetration reduces productivity dispersion mainly by inducing competition in allocation of resources within industries. This was especially so for industries with differentiated product, rather than for those with homogenous product suggesting that import competition is more severe in markets for differentiated product in China.

Edwards and Jenkins (2015) employ a Chenery-type decomposition and econometric estimation to investigate the impact of Chinese import penetration on the South African manufacturing sector in the period from 1992 to 2010. The results suggest that increased import penetration from China adversely affected South Africa manufacturing sector causing its output to be 5% lower in 2010 than it otherwise would have been. This also caused reduction in unemployment rate. Invariably, the adverse effect of import penetration on South Africa manufacturing sector would have engendered a decline in the volume of South Africa manufactured exports.

4.2.2. Foreign Direct Investment and Export Performance

Kugler (2006) investigates the effect of foreign investment on the exports of Venezuelan manufacturing firms using panel data set covering the 1995-2001 period. The study finds that the extent to which FDI stimulates export is dependent on multinational corporation's demand for domestic input.

Abor, Adjasi and Hayford (2008) estimate a probit model and random effect panel regression model to investigate the effect of FDI on the export decisions and export performance respectively, of firms in Ghanaian manufacturing sector in the period from 1991 to 2002. The results from the probit model shows that FDI has a positive effect on the firms' decision to export their productss, while the random effect panel regression result indicates a positive relationship between FDI and export performance.

Gu, Awokuse and Yuan (2008) employ panel data regression model to examine the effect of FDI on China's export performance in the period 1995-2005 using disaggregated data on 14 (fourteen) manufacturing sub-sectors within Mainland China. Evidence from the estimated fixed effect regression model selected based on the Hausman test, suggests that the effect of FDI inflows to the various sub-sectors on China's export was positive and significant within the sample period. Liu and Shu (2003) find that Chinese export performance is also positively influenced by foreign direct investment amongst other factors. For Taiwan's economy, Lee (2007) finds evidence in support of the proposition that FDI positively affects export performance in the period from 1952 to 2005.

Adhikary (2012) investigates the impact of FDI, and other variables (trade openness domestic demand and exchange rate) on the performance of exports of Bandladesh in the period from 1980-2009 using a

vector error correction model. The study shows that FDI impacts positively and significantly on changes in exports in both the short run and the long run.

Eryigit (2012) investigates the effect of FDI from 15 countries making direct investment in Turkey on the country's export volume in the 2000-2010 period, using panel data regression analysis. The analysis indicates a long term relationship between FDI and export volume in the country.

Iwamoto and Nabeshima (2012) employ the dynamic panel system GMM anaysis to investigate whether or not FDI inflows and stock promote export diversification and sophistication of host countries (developed and developing countries) in the 1980-2007 sample period. The analysis indicates that five-year lagged FDI inflow correlates positively with both export diversification and sophistication, and that FDI stock make positive contribution to export sophistication. These positive FDI impacts exist only in developing countries. Cetin and Altinas (2006) also find that changes in the export competitiveness of developed and developing countries are signifciantly and positively related to the level of inward FDI.

Vuksic (n.d) investigates the effect of inward FDI on export performance of fourteen tarnsition economies of Central and Eastern Europe over the period from 1993 to 2001. The economies include those of Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Macedonia FYR, Poland, Romania, Russian Federation, Slovakia, Slovenia and Ukraine. The results suggests that foreign direct investment, real effective exchange rate and development in the export markets have been significant determinants of export performance.

Heliso (2014) investigates the impact of inward FDI on disaggregated export of member countries of COMESA in the 1993-2012 period. The empirical result iindicates positive, significant relationship between FDI and export in agriculture, manufacturing and natural resource, the impact being larger on manaufacturing exports.

5. Methodology

5.1. Variables – Measurements and Data

The variables employed for the analysis are Non-oil export performance, import penetration rate, foreign direct investment, exchange rate, domestic investment and inflation. Apart from import penetration rate, non-oil export performance and gross domestic investment, data on the other variables are dirctly observable from the sources. Import penetration rate and export performance are therefore be derived in line with the extant literature.

(a) Import Penetration Rate:

Import penetration is defined as the ratio of imports to the gross domestic investment (GDP) adjusted for foreign trade balance. This is expressed mathematically as:

$$Import\ Penetration\ Ratio = \frac{\text{Imports}}{\text{GDP} - (\text{Exports} - \text{Imports})} * 100$$

(Source: Statistiches Bundesamt, Wiesbaben, 2014).

An alternative definition of import penetration is found in Kennedy and Thirwal (1979) and Beenstock and Warburton (2008) and is given as:

$$Import\ Penetration\ = \frac{\text{Imports}}{\text{GDP}} * 100$$

(b) Non-oil Export Performance

We define non-oil export performance as nonexport export earnings as percentage of GDP. This is expressed mathematically as:

$$Non - oil\ Export\ Performance\ = \frac{\text{Nonoil Exports}}{\text{Gross Domestic Product (GDP)}} * 100$$

Data used for the estimations are sourced from the Central Bank of Nigeria Statistical Bulletin, 2012.

5.2. Empirical Methodology, Model Specification

The empirical methodology employed to investigate the effect of import penetration and FDI inflows on the performance of Nigeria's non-oil export is the methodology of cointegration and error correction modeling (ECM) analysis. The choice of the methodology is informed by the need to investigate the long run and dynamic (short run) relationships between the variables. Several techniques exists for this method of analysis but we adopt the autoregressive distributed lag (ARDL) approach (also known as the Bounds test) approach to cointegration and error correction advanced by Pesaran, Shin and Smith (2001). The analysis involves testing the variables for unit root using any of or combination of methods of unit root test (ADF test, Phillips-Perron test, etc). This is done in order to identify the order of integration of the variables with a view to ensuring that the variables are utilized for the estimation in the forms in which they are stationary to avoid the problem of spurious (or non-sense) regression (which

yields R^2 > d.w. statistic) which could render the model unreliable for policy. The unit root test is followed by the cointegration test to investigate whether a long run relationship exists between the variables, by testing the existence of level relationship between the dependent variable and the regressors. Existence of long run (cointegration, equilibrium) relationship between the variables is a condition for representing the short run (dynamic) relationship between them with an error correction model.

The functional form of the model used to investigate the effect of import penetration and FDI on non-oil export performance is therefore specified as:

$$NOXPERF = f(IMPEN, FDI, EXRT) \quad (4)$$

Where NOXPERF = Non-oil export performance, defined as import-GDP ratio; IMPEN = Import penetration, FDI = Foreign direct investment; EXRT = Exchange rate (i.e. the naira/dollar exchange rate. This is incorporated in the model as a relevant explanatory, control variable).

The long run model is specified as:

$$LNOXPERF = \beta_0 + \beta_1 LIMPEN + \beta_2 LFDI + \beta_3 LEXRT + \mu_t \quad (5)$$

Where L = Natural logarithm, μ = residual term. The β's represent the long run parameters.

The associated error correction model to be estimated is specified as:

$$\Delta LNOXPERF_t = a_0 + a_1 \Delta LNOXPERF_{t-1} + \sum_{i=0}^{m} \left(\theta_i \, \Delta LFDI_{t-i} \right) + \sum_{j=0}^{n} \left(\chi_j \, \Delta LIMPEN_{t-j} \right) + \sum_{k=0}^{P} \left(\partial_k \, \Delta LEXRT_{t-k} \right) + \Omega ECT_{t-1} + \xi_t \quad (6)$$

The variables are as previously defined. Δ is the difference operator. ECT_{t-1} is the error correction term included in the model to play the role of error correction, which is, reconciling short run dynamics with equilibrium, long run relationship. To play this role in the model, its coefficient (Ω) is expected to be negatively signed and statistically significant. The negative and significant coefficient also indicates cointegration of the variables. θ_i χ_j, ∂_k, are the short run parameters, indicating the short run effects of the explanatory variables on the dependent variable. m, n, p, q, r are appropriate (optimal) lags of each variable in the ECM.

The *a priori* expectations are $\theta_i > 0$, $\chi_j > 0$, $\partial_k > 0$,

The estimations shall be performed with the aid of Microfit 5.0 Interactive Econometric computer software.

5.3. Justification of Inclusion of Selected Variables and *A prior* Expectation

The variables included in the model have been carefully selected on the basis of theory and empirical evidence from previous works investigating the determinants of export performance (Fugazza, 2004; Majeed and Ahmad, 2006).

FDI and Import Penetration

The flow of FDI into the economy, particularly the non oil sector is expected to boost production and output in the sector, as it contributes to technological advancement, managerial skills and, given favourable export policies, it promotes structural evolution of the export sector (Kojima, 1975; Fugazza, 2004; Majeed and Ahmad, 2006) and, this (expansion of output) could in turn boost the performance of the country's export. The effect of imports on the performance of non oil export is dependent on the composition of a nation's imports. If there is preponderance of output-enhancing commodities or inputs in the composition of a nation's import, this could lead to expansion of output and enhancement of export performance. However, if there is preponderance of consumables in import composition, this could adversely affect domestic production which in turn could have adverse effect on export volume and export earnings.

***Exchange Rate*.**

International trade theory posits that currency depreciation or devaluation could be favourable to export in the long run. The rational is that with increase in exchange rate (i. e. currency devaluation or depreciation), a country's export becomes cheaper in the foreign markets while its import becomes more expensive in the domestic market. However, the theoretical effect of currency depreciation on export and import depends on the elasticity of demand for the country's export in the foreign market as well as the elasticity of demand for import in the domestic market. If the demand for a country's export commodities in the foreign market is inelastic, currency depreciation may not have any significant effect the performance of the country's export. Similarly, if the country's demand for import is inelastic, the ability of currecncy depreciation to reduce import will be undermined.

6. Results and Their Implications

6.1. Unit Root and Cointegration Tests Results

Though the Bounds Test for cointegration does not necessarily require unit root test as it is suited for testing the existence of level relationship between variables irrespective of the order of integration of each variable, we present the outcome of the unit root test for the variables in this section. The results of the Augmented Dickey Fuller and Phillips-Peron tests for unit root are shown in Table 1. The Dickey Fuller regression for unit root test for FDI, import penetration and exchange rate variables include an intercept and a trend, while that of nonoil export performance includes an intercept, but not a trend as Figure 3 suggests that the variable is not trending.

Table 1. Unit Root Test for Variables.

Augmented Dickey Fuller Test							
Variables	**Levels**			**First Difference**			**Order of Integration**
	ADF Test Stat.	Test Critical Value (5%)	Inferences	ADF Test Stat.	Test Critical Value (5%)	Inferences	
Log(NOXPERF)	-2.434	-2.9627	Non-stationary	-3.861	-2.967	Stationary	1
Log(FDI)	-1.743	-3.567	Non-stationary	-4.868	-3.573	Stationary	1
Log(IMPEN)	-2.635	-3.567	Non-stationary	-4.576	-3.573	Stationary	1
Log(EXRT)	-1.200	-3.567	Non-stationary	-5.222	-3.573	Stationary	1
Phillips-Peron Test							
VARIABLES	**Levels**			**First Difference**			**Order of Integration**
	PP-Test Stat	Test Critical Value (5%)	Inferences	PP-Test Stat.	Test Critical Value (5%)	Inferences	
Log(NOXPERF)	-2.825	-3.563	Non-stationary	-10.399	-3.568	Stationary	1
Log(FDI)	-3.319	-3.563	Non-stationary	-10.630	-3.568	Stationary	1
Log(IMPEN)	-2.868	-3.563	Non-stationary	-8.130	-3.568	Stationary	1
Log(EXRT)	-1.015	-3.563	Non-stationary	-5.970	-3.568	Stationary	1

The ADF and Phillips Peron unit root test results indicate that all the variables are integrated of order 1 [I(1)], that is to say they are stationary at first differences. Though the variables are individually non stationary at levels (as indicated by the PP-test), for a linear combination of the variables to be stationary. If this is the case, the implication would be that there is a long run (equilibrium) relationship

between them, suggesting that they will move closely together without drifting too far apart in the long run. The result of the ARDL Bounds test for cointegration based on an estimated ARDL model shown in the Appendix (Table A1) is presented in Table 2.

Table 2: Cointegration Test: ARDL (Bounds Test) Cointegration Result

F-statistic	95% Lower Bound	95% Upper Bound	90% Lower Bound	90% Upper Bound
7.478	3.704	5.050	3.012	4.175

The cointegration test result shows that the computed F-statistic is greater than the 95% and 90% critical value upper bounds. This indicates that the variables are cointegrated, that is there is a level relationship between the dependent variable and the explanatory variables. On the strength of this, the long run model and the error correction model are estimated to investigate long run and short run relationship (respectively) between the dependent variable and the explanatory variables. The results are presented in Table 3 and Table 4. The full results are included in the Appendix as Table A2 and Table A3 respectively.

Table 3. Estimated Long Run Coefficients and Error Correction Representation using the ARDL Approach
ARDL(1,2,0,1) selected based on Schwarz Bayesian Criterion

Long Run (Static) Model			Error Correction Model		
Dependent Variable is LNOXPERF			Dependent Variable is dLNOXPERF		
Regressor	Coefficient	T-Ratio.	Regressor	Coefficient	T-Ratio.
LIMPEN	-1.011	-2.032	ΔLIMPEN	0.635	3.125
LFDI	-0.063	-1.522	ΔLIMPEN1	0.630	3.095
LEXRT	0.250	2.383	ΔLFDI	-0.035	-1.698
C	1.961	1.588	ΔLEXRT	-0.209	-1.325
			ecm (-1)	-0.553	-4.277
			R-Squared = 0.714; R-Bar-Squared = 0.623 $F_{(5, 24)}$ = 10.992; DW = 2.406		

The results reveal that only the EXRT variable has the expected positive sign in the estimated long run model, while only the IMPEN variable has the expected positive sign in the estimated error correction model. The ECM further reveals that import penetration impacts positively and significantly on the performance of Nigeria's nonoil export in the short run, contemporaneously and with a lag. The impacts are significant even at the 1% level. This suggests that importation positively affects the performance of Nigeria's nonoil export and underscores the importance of imported inputs particularly raw materials, managerial skills and improved technologies, to domestic production or output, which (going by the Vent for Surplus theory) engenders expansion in volume of export and hence, export earnings in the short run particularly in developing or emerging markets economies. This result lends support to the existence of a Kaldor's effect, of import penetration positively affecting export performance through its

effect on output, but we cannot say whether or not it supports the extreme form of Kaldor's hypothesis which argues that the rise in export ratio (export performance) is not autonomous but due to the adverse effect of import penetration on output. However, our finding is in tune with the findings of Babatunde (2009) and Mukhtar and Rasheed (2010). We observe from the result that increase in import penetration rate has the effect of increasing the share of nonoil export in GDP by almost same amount contemporanously and with a lag as shown by the coefficients in the error correction model. The long run effect of import penetration on the share of nonoil export in the GDP is negative and significant at 6% level. This could be attributed to the adverse effect of high rate of importation on productivity and output of domestic firms (producers) and employment which have the tendency to adversely affect export in the long run. This finding is in tune UBIC (2013), Ding et al (2013) and Edwards and Jenkins (2015).

The results show that the long run and short run effects of FDI inflows on non-oil export performance were not statistically significant in the sample period. This indicates that FDI did not contribute meaningfully to the performance of Nigeria's nonoil export within the period under review. This could be attributed to the fact that the inflow of FDI to the non-oil sectors (agriculture, manufacturing, etc) of the economy within the sample period was quite meager compared to the amount of FDI that flowed into the oil and gas sector. This observation suggests the need for greater inflow of FDI to the productive, nonoil sector of the economy which could be achieved through implementation of policies that will make the country's nonoil sector attractive to foreign investors, to enhance its contribution non-oil output and hence boost non-oil exports as suggested by the Vent for Surplus theory.

The short run effect of currency depreciation (that is increase in exchange rate) on the performance of Nigeria's non-oil export is not statistically significant. Its long run effect is however positive and significant even at the 3% level. This observation is in line with theoretical postulations. It indicates that currency depreciation has been favourable to the growth of the country's non-oil export. Specifically, a 10% increase in the exchange rate was associated with a 2.5% increase in the share of non-oil export in the GDP.

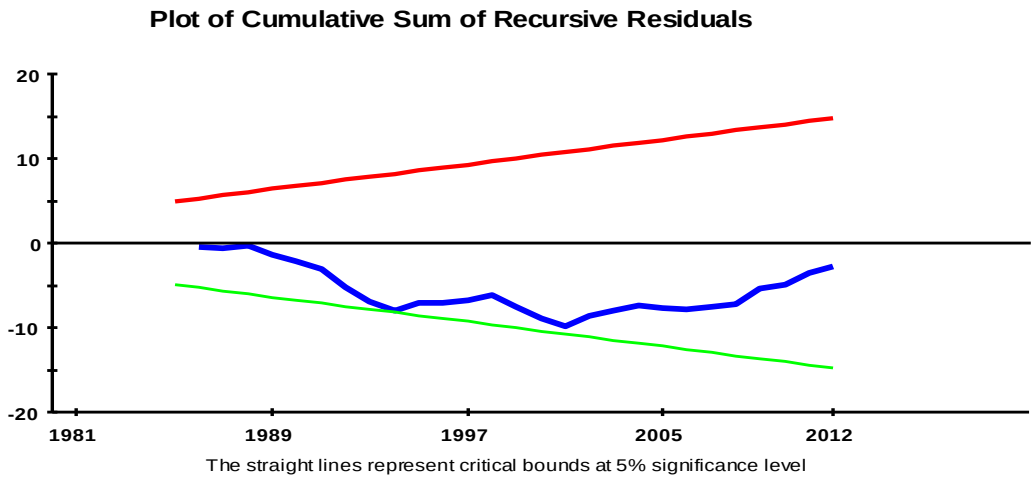
The coefficient of the error correction term in the estimated ECM has the expected negative sign and it is highly statistically significant even at the 1% level. Its absolute value suggests moderate speed of adjustment to equilibrium in the event of short run deviation there from. It indicates that over 55.3% of disequilibrium in the system is offset by short run adjustment annually to maintain equilibrium.

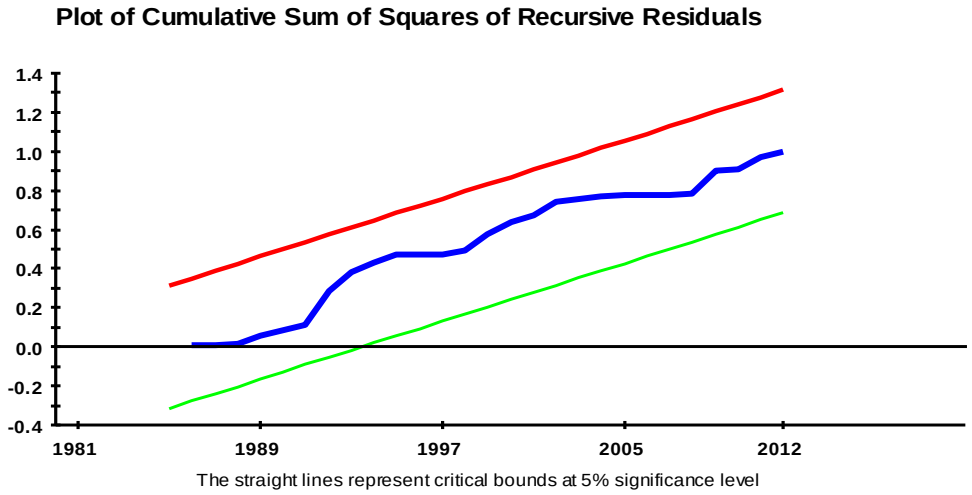
The coefficient of determination of the ECM indicates the model has a high goodness of fit as it shows that 71.4% of the systematic variation in the dependent variable is explained by the regressors. The F-statistic which is highly significant even at the 1% level of significance indicates that the variables are jointly significant in the determination of the performance of Nigeria's non-oil export.

6.2. Model Stability Test

The stability of estimated model enhances its reliability for policy. We test the stability of the model with the plots of the cumulative sum of recursive residuals (CUSUM) and cumulative sum of squares of recursive residuals (CUSUMSQ). The plots are shown in Figure 1 below.

Figure 5. Testing the Stability of the Model: The CUSUM and CUSUMSQ Approach





It can be observed that the plots of both the CUSUM and CUSUMSQ lie between the straight lines representing critical bounds at 5% significance level. This suggests that the (parameters of the) models are structurally stable, and hence the models could be relied upon for policy formulation.

6.3. Recommendations for Policy

Based on the empirical results, the following are recommended for policy considerations

i. Since import penetration is observed to positively affect the performance of Nigeria's non-oil export in the short run, but adversely affects it in the long run, there is need to ensure that there

is preponderance of output-expanding inputs such as raw materials and technologies in the composition of the nation's imports. This could be achieved by reducing the tariffs on imported industrial raw materials and technologies, and imposing higher tariffs on finished goods. This however should be done cautiously to avoid the possibility of retaliatory tariffs which could cause trade distortions and reduction in global output of goods and services. Smuggling should also be curtailed.

ii. Considering that currency depreciation is favourable to the performance of Nigeria's non-oil export, there is need for the monetary authority to strengthen its regulatory apparatus to ensure timely intervention in the nation's foreign exchange market to avoid over appreciation of the domestic currency (the Naira) and maintain its exchange rate at levels consistent with improved exports trade.

7. Conclusion

The paper investigated the effects of import penetration and foreign direct investment (FDI) on the performance of Nigeria's non-oil export in the period from 1981 to 2012 using the methodology of cointegration and error correction analysis. The empirical analysis reveals that import penetration positively affected the performance of Nigeria's non-oil export in the short run, though the long run effect was negative. It also shows that the short run and long run effects of FDI on non-oil export performance in the period covered by the study were not statistically significant. Further evidence from the study were that the short run effect of currency depreciation on the performance of the non-oil export was not statistically significant, but the long run effect was positive and significant indicating that currency depreciation favourably affects non-oil export performance in the long run in Nigeria. Based on the empirical evidence, the study recommended, *inter alia,* reduction in tariffs on imported industrial inputs (raw materials and technologies) used for local production as well as prevention of over appreciation of the domestic currency (the Naira) by maintaining its exchange rate at levels consistent with improved trade. On the basis of our findings, the null hypotheses that import penetration does not affect non-oil export performance in the 1981-2012 sample period is rejected, while the null hypothesis of no significant effect of FDI on non-oil export performance cannot be rejected at the 5% level.

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APPENDIX

ESTIMATION OUTPUT FROM MICROFIT 5.0

```
                Table A1 Autoregressive Distributed Lag Estimates
          ARDL(1,2,0,1) selected based on Schwarz Bayesian Criterion
*******************************************************************************
 Dependent variable is LNOXPERF
 30 observations used for estimation from 1983 to 2012
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 LNOXPERF(-1)               .44657             .12939          3.4513[.002]
 LIMPEN                     .63503             .20324          3.1246[.005]
 LIMPEN(-1)                -.56454             .21157          -2.6684[.014]
 LIMPEN(-2)                -.62992             .20356          -3.0945[.005]
 LFDI                     -.034821            .020505          -1.6982[.104]
 LEXRT                     -.20916             .15789          -1.3247[.199]
 LEXRT(-1)                  .34746             .15411          2.2546[.034]
 C                          1.0854             .56910          1.9072[.070]
*******************************************************************************
 R-Squared                      .81815   R-Bar-Squared                .76029
 S.E. of Regression             .24612   F-Stat.    F(7,22)       14.1402[.000]
 Mean of Dependent Variable    -.37437   S.D. of Dependent Variable   .50269
 Residual Sum of Squares        1.3326   Equation Log-likelihood      4.1425
 Akaike Info. Criterion        -3.8575   Schwarz Bayesian Criterion   -9.4623
 DW-statistic                   2.4062   Durbin's h-statistic        -1.5768[.115]
*******************************************************************************

Testing for existence of a level relationship among the variables in the ARDL model
*******************************************************************************
 F-statistic  95% Lower Bound  95% Upper Bound  90% Lower Bound  90% Upper Bound
    7.4775          3.7038          5.0495          3.0123          4.1752
```

```
 W-statistic  95% Lower Bound  95% Upper Bound  90% Lower Bound  90%
Upper Bound
   29.9102         14.8151         20.1980         12.0492
16.7008
*************************************************************************
***********
 If the statistic lies between the bounds, the test is inconclusive.
If it is
 above the upper bound, the null hypothesis of no level effect is
rejected. If
 it is below the lower bound, the null hypothesis of no level effect
can't be
 rejected. The critical value bounds are computed by stochastic
simulations
 using 20000 replications.
```

Table 2. Estimated Long Run Coefficients using the ARDL Approach

ARDL(1,2,0,1) selected based on Schwarz Bayesian Criterion

```
*************************************************************************
***********
 Dependent variable is LNOXPERF
 30 observations used for estimation from 1983 to 2012
*************************************************************************
***********
 Regressor              Coefficient       Standard Error         T-
Ratio[Prob]
 LIMPEN                    -1.0108             .49748           -
2.0319[.054]
 LFDI                     -.062920            .041351           -
1.5216[.142]
 LEXRT                     .24990             .10486
2.3831[.026]
 C                         1.9612             1.2350
1.5880[.127]
*************************************************************************
***********

Testing for existence of a level relationship among the variables in
the ARDL model
*************************************************************************
***********
 F-statistic  95% Lower Bound  95% Upper Bound  90% Lower Bound  90%
Upper Bound
    7.4775          3.7038          5.0495          3.0123
4.1752

 W-statistic  95% Lower Bound  95% Upper Bound  90% Lower Bound  90%
Upper Bound
   29.9102         14.8151         20.1980         12.0492
16.7008
```

```
************************************************************************
***********
 If the statistic lies between the bounds, the test is inconclusive.
If it is
 above the upper bound, the null hypothesis of no level effect is
rejected. If
 it is below the lower bound, the null hypothesis of no level effect
can't be
 rejected. The critical value bounds are computed by stochastic
simulations
 using 20000 replications.
```

Table 3. Error Correction Representation for the Selected ARDL Model

ARDL(1,2,0,1) selected based on Schwarz Bayesian Criterion

```
************************************************************************
***********
 Dependent variable is dLNOXPERF
 30 observations used for estimation from 1983 to 2012
************************************************************************
***********
 Regressor              Coefficient       Standard Error         T-
Ratio[Prob]
 dLIMPEN                    .63503            .20324
3.1246[.005]
 dLIMPEN1                   .62992            .20356
3.0945[.005]
 dLFDI                    -.034821           .020505           -
1.6982[.102]
 dLEXRT                    -.20916            .15789           -
1.3247[.198]
 ecm(-1)                   -.55343            .12939           -
4.2771[.000]
************************************************************************
***********
 List of additional temporary variables created:
 dLNOXPERF = LNOXPERF-LNOXPERF(-1)
 dLIMPEN = LIMPEN-LIMPEN(-1)
 dLIMPEN1 = LIMPEN(-1)-LIMPEN(-2)
 dLFDI = LFDI-LFDI(-1)
 dLEXRT = LEXRT-LEXRT(-1)
 ecm = LNOXPERF +   1.0108*LIMPEN +  .062920*LFDI   -.24990*LEXRT
-1.9612*C
************************************************************************
***********
 R-Squared                     .71414   R-Bar-Squared
.62319
 S.E. of Regression            .24612   F-Stat.    F(5,24)
10.9923[.000]
 Mean of Dependent Variable   .058810   S.D. of Dependent Variable
.40094
 Residual Sum of Squares       1.3326   Equation Log-likelihood
4.1425
```

```
 Akaike Info. Criterion       -3.8575   Schwarz Bayesian Criterion
-9.4623
 DW-statistic                  2.4062
********************************************************************
**********
 R-Squared and R-Bar-Squared measures refer to the dependent
variable
 dLNOXPERF and in cases where the error correction model is highly
 restricted, these measures could become negative.

Testing for existence of a level relationship among the variables in
the ARDL model
********************************************************************
**********
 F-statistic  95% Lower Bound  95% Upper Bound  90% Lower Bound  90%
Upper Bound
    7.4775          3.7038          5.0495          3.0123
4.1752

 W-statistic  95% Lower Bound  95% Upper Bound  90% Lower Bound  90%
Upper Bound
   29.9102         14.8151         20.1980         12.0492
16.7008
********************************************************************
**********
 If the statistic lies between the bounds, the test is inconclusive.
If it is
 above the upper bound, the null hypothesis of no level effect is
rejected. If
 it is below the lower bound, the null hypothesis of no level effect
can't be
 rejected. The critical value bounds are computed by stochastic
simulations
 using 20000 replications.
```