The Determinants of Import in Nigeria over the Period 1980 - 2015

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Abstract: **- Excessive importation of goods and services has serious implications for macroeconomic stability through imported inflation. It can also engender balance of payments disequilibrium and impinge on the credit rating of a country. Excessive importation can also lead to a drain on foreign exchange reserves and further worsen the balance of payments position. Therefore the study investigated the determinants of import in Nigeria over the period 1980 to 2015. The study employed expost facto research design. Secondary time series data were used for the study and these were sourced from World Integrated Trade Solution (WITS, 2013) Database and World Development Indicator (WDI, 2016).The data collected were analyzed using autoregressive distributed lag. The inferences were drown at 5% significance level. The result showed that domestic income and index of openness exert a long-run positive and significant impact on import of goods and services in Nigeria (β = 0.91022, t = 124.4775 and β = 1.7443, t = 11.7163 respectively) but domestic interest rate exerts a long-run negative and significant impact on import of goods and services in Nigeria (β = -0.08934, t = -1.9822). While import prices, domestic income and index of openness exert a short-run positive and significant impact on import of goods and services in Nigeria (β = 0.036972, t = 2.1542; β = 0.64899, t = 8.0852 and β = 1.0345, t = 6.6297 respectively). The value of the coefficient of the dummy variable is appropriately signed and statistically significant, meaning that SAP achieved its cardinal objectives of significant reduction in import of goods and services in Nigeria through exchange rate depreciation. The study concluded that trade openness in the short-run discourages import while openness in the long run encourages import. Most of the good imported are inelastic in nature during the period selected and they are normal goods. The study recommended that recalibration of the naira since devaluation or depreciation of the domestic currency which was the main ingredient of SAP did not work and this will improve the competitiveness of exports. It will also help to improve Nigeria's trade balance with its trading partners by making imports of machineries and equipments less expensive.**

Keywords: **Domestic Income, Domestic Interest Rate, Import, Import Prices, Dummy variable and Real Exchange Rate, ARDL Bound Test**

I. INTRODUCTION

Import is vital to economic growth and development as it affects production, which in turn constitutes the source of expansion in any economy. The motivation for a country to import goods and services varies from one country to another. The motives include: to provide goods and services required for the wellbeing of the citizenry; to bridge the production gap for goods that can be produced locally but not in large quantity; and raw materials for industrial usage. Most importantly, in conformity with the comparative advantage, countries tend to import goods that cannot be produced efficiently, while others are for fiscal reasons to boost government revenue for developmental purposes (Englama, Oputa, Sanni, Yakub, Adesanya, and Sani, 2013). Nigeria is not left out among the countries that import goods and services and her main import partners are China, Albania, United State, France, and Belgium. Nigeria imports mainly industrial supplies, transport equipment and parts, capital goods, food, beverage and consumer goods (CBN, 2012).

Nigeria's aggregate import had grown considerably since the country's independence; from an average annual growth rate of 2.5% during the 1960s. Total imports rose from an average of ₦4.23 billion or 16.9% of GDP from 1970 to 1980, to ₦16.86 billion or 16.0% of GDP, during 1981 to 1990; and further to ₦540.95 billion or 26.7% of GDP from 1991 to 2000. The persistent growth in the value of total imports continued in 2001 and stood at ₦1,358.18 billion or 28.7% of GDP, it peaked at ₦2,080.24 billion and contributed 24.5% to GDP in 2003, but thereafter fell steadily to ₦1,987.05 billion or 17.4% of GDP in 2004. The upward trend in the value of total imports has remained sustained since 2005 to 2011. Import bills rose from ₦2,800.86 billion or 19.2% of GDP in 2005 to ₦3,108.52, ₦3,911.95 and ₦5,189.80 billion or 16.7%, 18.9% and 21.4% of GDP in 2006, 2007 and 2008, respectively. The value of imports continued to rise and in 2011 it stood at ₦10,235.17 billion or 27.4% of GDP. Excessive importation of goods and services has serious implications for macroeconomic stability through imported inflation. It can also engender balance of payments disequilibrium and impinge on the credit rating of a country. Excessive importation can also lead to a drain on foreign exchange reserves and further worsen the balance of payments position. In most cases, however, import is expected to propel growth if it is investment-induced (Englama, Oputa, Sanni, Yakub, Adesanya, and Sani, 2013). Despite the fact that Nigeria's average aggregate imports have kept a substantial rising profile within the period, the growth in the domestic economic activities in relative terms appears non responsive and this calls for investigation (Ogbonna, 2015).

Therefore, the study is to investigate the determinant of import in Nigeria over a period of 1980 to 2015. The specific objectives are:

- to determine the price and income elasticity of Nigeria's import.
- to account for policy reform measures and structural changes over the period.
- to examine the short-run and long-run determinant of the country's import.

The rest of the work is literature review, methodology, results and summery, discussion, conclusion and recommendations.

II. LITERATURE REVIEW

2.1Theoretical Review

The neoclassical comparative advantage theory characterized by Eli Heckscher and Bertil Ohlin (H-O, 1968) framework was built on the works of Ricardo, (1817). The theory is based on the assumption that countries differ by the factors of production, therefore, they tend to import goods that they have least factor endowment. Consequently, international trade is affected by changes in relative prices of these endowed factors. Labour and capital flow freely between sectors and there amount differ across countries and technology and testes are the same in both countries.

Goldstein and Khan (1985) presented two trade models: the imperfect substitution model and the perfect substitution model. While the latter is mainly for the trade of homogeneous commodities, the former is the one mostly used in studying imports of manufactured goods and aggregate imports. The basic assumption of the imperfect substitution model is that neither imports nor exports serve as perfect substitutes for domestic goods. This assumption has for the most part been confirmed empirically, both in the short and in the long run. If domestic and foreign goods were perfect substitutes, then countries would specialize, either only importing or only exporting each particular good. In practice, however, both domestic and imported goods can be found coexisting on markets, indicating that countries do not in fact specialize to such a high degree. The imperfect substitution model is in line with the conventional demand theory which derives from the constrained optimization problem where consumers maximize their utilities subject to budget constraint (Goldstein and Khan, 1985). Thus, in the simplest form, the utility function of each consumer contains two goods (local and foreign products) and the resulting aggregate import demand function presents the quantity of import demand as a direct function of the level of nominal income in the importing country; inverse function of own price of the import and price of the local good.

2.2 Empirical Review

Determinants of import literature are quite extensive at single-country level. However, results are mixed in terms of the direction of influence, as well as price and income elasticities of import. For instance, some studies simply stressed that the direction of response of import to changes in income and price followed theoretical expectation. Çakmak, Gökçe and Çakmak, (2016) ascertained the key determinants of the import in Turkish economy using a quarterly data from2003.Q1- 2014.Q4. Empirical evidences demonstrated that %1 rise in real exchange rate will lead 0.29% increase on import, %1 rise of export will lead 0.86% increase on import and %1 rise of real exchange rate will lead 3.14% increase on import. Using annual data for 1980 - 2010 period, Karagöz, (2016) examined the determinants of Turkey's export performance. Results of the analysis reveal that demand for export increases when domestic currency remains depreciated. According to estimations, export supply was positively related to the domestic relative price of exports whereas domestic demand affects export supply negatively. Foreign direct investment and external income level turned out insignificant. Turkey's export performance has been positively affected from economic crisis in 2001, which motivated the searches for new markets and hence exports expansion.

Zhang, Zhao, Kuuluvainen, Wang and Li, (2015) estimated the long-run and short-run demand equations for imported lumber based on classical production theory using Chinese monthly data from January 2000 to December 2013 data. The bounds testing approach for co-integration was employed within an autoregressive distributed lag framework and the results showed that there exists a long-run co-integrating relationship between China's lumber import and some specific explanatory variables. In the long run, the import demand was found to be elastic with respect to the lumber import price and a macroeconomic shifter at the 5% statistical level. Imported lumber seems to be a complement to other input factors, but the effect is not statistically significant. As expected, the short-run price and income elasticities are smaller in absolute terms than their long-run counterparts.

Ediger and Berk, (2011) determined the factors behind the crude oil import policy of Turkey and to measure their contribution to a well-organized import strategy. The study implemented a principle component analysis to construct an Oil Import Vulnerability Index (OIVI) based on four factors, which are crude oil import dependency of primary energy consumption, crude oil import bill as a share of Gross Domestic Product (GDP), non-diversification of import sources, and share of oil in total energy import. The contribution of these factors to the OIVI is found to be approximately equal. While an overall deterioration in the OIVI has been observed during periods of increasing oil prices, better diversification of oil import sources has lead to significant improvements.

Zhao and Wu, (2007) investigated the determinants of China's energy import demand by using co-integraiton and VECM techniques. The findings suggest that, in the long run, growth of industrial production and expansion of transport sectors affects China's oil imports, while domestic energy output has a substitution effect. Thus, as the Chinese economy industrializes and the automotive sector expands, China's oil imports are likely to increase. Though China's domestic oil production has a substitution effect on imports, its growth is

limited due to scarce domestic reserve and high exploration costs.

Gouvêa and Schettini, (2015) presented econometric estimates for the Brazilian aggregate imports over the period 1996 – 2010. The study explored the co-movements among total imports, gross fixed capital formation and household consumption (alternative model). The results underscore the role played by domestic income, which is the main determinant of total imports. The limited domestic supply of capital goods makes the allocation of domestic income also relevant to the imports dynamics. The out-of-sample assessment (one-step-ahead forecast) shows a good performance of the long-run vectors of the alternative models in predicting aggregate imports, meanwhile the best performance is obtained by the error correction representations of the canonical model.

Also, in the case of Nigeria, Eme, Alwell and Marius, (2013) aimed at measuring the relative strengths and nature of effects of the variables that determine Nigeria's non-oil import demand, and subsequently assessing the extent to which results are in conformity with those previously obtained on a wider aggregate of the Nigerian economy and the results indicated a deviations from the findings of earlier studies, as two key variables previously reported as significant (real exchange rate and real income) showed insignificant causational relationships in the model.

Adewuyi, (2016) estimated determinants of import demand for refined petroleum products in Nigeria for the period 1984–2013. It employed the autoregressive distributed lag (ARDL) bounds test co-integration method and analysed both long-run and short-run determinants of import demand for total and specific petroleum products. In the long-run, aggregate and sectoral incomes are significant determinants of import of refined kerosene. Further, real effective exchange rate (REER), aggregate income (GDP), manufacturing sector's income, domestic energy production (DEP) and population growth rate (PGR) are drivers of import of refined motor spirit. Moreover, REER, DEP and manufacturing sector's income are propellers of import of refined distillatefuel. Also, REER and total output of petroleum products are major drivers of total import of refined petroleum products. Short-run results show that previous period GDP, PGR and manufacturing and service sectors' incomes are determinants of import demand for refined kerosene. Moreover, REER, GDP, previous PGR and manufacturing sector's income exert significant effects on the import of refined motor spirit. Further, significant effects of REER, DEP, previous PGR, domestic output of the product and manufacturing and service sectors' incomes on the import demand for distillate fuel were found.

Nwogwugwu, Maduka and Madichie, (2015) used import substitution model framework to estimate the price and income elasticities of import demand in Nigeria for the period 1970 – 2013. The study used Autoregressive Distributed Lag (ARDL) bound test to study the long-run relationship between variables of interest. The estimated long-run coefficients showed that the price and income elasticities of import demand in Nigeria were about 0.03 and 0.55 respectively during the period covered and it implied that the long run import demand in Nigeria has been price-and income-inelastic since the sizes of the coefficients of real GDP and relative prices were less than unity and among the explanatory variables studied, real GDP was the main determinant of import demand in Nigeria. The results from the short-run dynamics of the model suggest that about 67 percent of the disequilibrium between the long term and short term import demand is corrected each year.

Ogbonna, (2016) estimated the aggregate import demand function for Nigeria for the period of 1980 - 2010. Co-integration approach was implemented while the error correction term in the estimated VEC model was evaluated for long-run causal relationship, the short term coefficients were gauged for short term causal relationship between the explained and the explanatory variables. Results indicated the existence of an underlying long-run stationary steady state relationship between import demand and real exchange rates, world price index and disposable in Nigeria. Real exchange rates, world price index, disposable income and the structural adjustment policy, jointly significantly cause import demand on the long run in Nigeria with causality running from the explanatory variables to imports. In the short run, all the explanatory variables of interest, real exchange rate, world price index and disposable income, severally do not significantly cause import demand in Nigeria.

Nteegah and Nelson, (2016) investigated the factors influencing import demand in Nigeria over the period 1980 – 2014 using the Ordinary Least Square (OLS) and co-integration/error correction mechanism. The result revealed that real income level, domestic price change, exchange rate all have negative and significant impact on total import demand in Nigeria while degree of openness; gross capital formation and external debt have positive and significant implication on total import demand.

The general observation is that most of the studies make use of ordinary least square and vector error correction and also make use of inflation as the measure of import prices while few studies in Nigeria make use of autoregressive distributed lag. In order to make this work unique and different, the study will make use of autoregressive distributed lag but import value index divided by domestic price index will be used as the price of import instead of the inflation rate and this study will also include domestic interest rate which has not been used before by the studies reviewed. Lastly, to account for policy reform measures and structural changes, the study also include a dummy variable in both the short-run and long-run dynamic equations (zero "0", for the period of fixed exchange rate regime and one "1", otherwise, the period of flexible exchange rate regime).

III. METHODOLOGY

3.1 Theoretical Framework

The theoretical framework for this study is based on the imperfect substitution model provided by Goldstein and Khan (1985). The imperfect substitution model is in line with the conventional demand theory which derives from the constrained optimization problem where consumers maximize their utilities subject to budget constraint (Goldstein and Khan, 1985). Thus, in the simplest form, the utility function of each consumer contains two goods (local and foreign products) and the resulting aggregate import demand function presents the quantity of import demand as a direct function of the level of nominal income in the importing country; inverse function of own price of the import and price of the local good.

$$\mathbf{M = f(Pm \ \& \ DI)} \qquad \mathbf{(3.1)}$$

(-, +)

3.2 Model Specification

The model specification for this study is based on the theoretical framework above but the model will be modified to include other explanatory based on the past work in this line (Zhang, Zhao, Kuuluvainen, Wang and Li, 2015; Nwogwugwu, Maduka and Madichie, 2015; Adewuyi, 2016 and Ogbonna, 2016). In order to make this work unique and different, the study will include domestic interest rate and import value index divided by domestic price index will be used as the price of import instead of the inflation rate.

Import Functions

$$\mathbf{M = f(Pm, DI, REXR, DIR, IO \ \& \ D)} \qquad \mathbf{(3.2)}$$

Where M = Imports of goods and services; Pm = Import prices (Import value index divided by domestic price index, DI = Domestic income, REXR = Real exchange rate, DIR = Domestic interest rate and D = Dummy variable with value "0" for 1980 – 85, to indicate the era of quantitative restrictions through import licenses and tariff, and value "1" for 1986 – 2015, to represent the era of trade liberalization associated with SAP.

The linear regression of the model is given in equation (3.4) below

$$\mathbf{M = ß_0 + ß_1Pm + ß_2DI + ß_3REXR + ß_4DIR + ß_5IO + ß_6D + u} \qquad \mathbf{(3.3)}$$

In the logarithmic form, Equation (3.3) becomes:

$$\mathbf{LN(M) = ß_0 + ß_1Pm + ß_2LN(DI) + ß_3REXR + ß_4DIR + ß_5IO + ß_6D + u} \qquad \mathbf{(3.4)}$$

Therefore, the coefficients in the models ß1 – ß4 define elasticity's of the logged variables while ß5 is the mean of the dummy variable.

Where:

3.3 A Priori Expectation

The a priori expectation is that a positive relationship would be established between imports of goods and services and domestic income, domestic interest rate and index of openness while there a negative relationship between between imports of goods and services and import pices, real exchange rate and dummy variable (Zhang, Zhao, Kuuluvainen, Wang and Li, 2015; Nwogwugwu, Maduka and Madichie, 2015; Adewuyi, 2016 and Ogbonna, 2016).

Table 3.1: A priori Expectation

Explanatory Variables	Symbols	Hypothesis	Expected sign
Import prices	P_m	Import price is inversely related to import of goods and services.	-
Domestic income	DI	Domestic incomeis positively related to import of goods and services.	+
Real exchange rate	REXR	Real exchange rate has an inverse relation with to import of goods and services.	-
Domestic interest rate	DIR	Domestic interest rate is directly related to import of goods and services.	+
Index of openness	IO	Index of openness has a direct relation with to import of goods and services.	+
Dummy variable	D	Dummy variable has inverserelation with to import of goods and services.	-

Source: Author's Computation

3.4 Sources of Data and Measurement

Annual data covering the period from 1980 to 2015 will be employed and the data would be sourced from World Integrated Trade Solution (WITS, 2013) Database and World Development Indicator (WDI, 2016). Dummy variable was also included to capture the era of quantitative restrictions through import licenses and tariff, and the era of trade liberalization associated with structural adjustment programme (SAP). Essentially, for the reason of uniformity in measurement, and clarity in the interpretation of findings, the variables will be transformed to their natural logarithms to eliminate any serial correlation.

3.5 Estimation Techniques

The study makes use of the autoregressive distributed lag (ARDL) bounds testing procedure. The ARDL bounds testing procedure to co-integration examines the long-run equilibrium relationship between a dependent variable and a set of regressors in levels irrespective of the order of integration of the regressors: whether 1(0), 1(1) or mutually/fractionally co-integrated. As equation (3.4) stated the long-run relationship among z_t variables, short-run dynamics can be incorporated using the ARDL method by expressing the two equations in error-correction modeling form

$$LN(\mathrm{M})_t = \sum_{K=1}^{n} \beta_1 \mathrm{Pm}_{K-1} + \sum_{K=1}^{n} \beta_2 LN(\mathrm{DI})_{K-1} + \sum_{K=1}^{n} \beta_3 \mathrm{REXR}_{K-1} + \sum_{K=1}^{n} \beta_4 \mathrm{DIR}_{K-1} + \sum_{K=1}^{n} \beta_5 \mathrm{IO}_{K-1} + \sum_{K=1}^{n} \beta_6 \mathrm{D}_{K-1} + \lambda ECM_{t-1} + \beta_7 \mathrm{Pm}_{t-1} + \beta_8 LN(\mathrm{DI})_{t-1} + \beta_9 \mathrm{REXR}_{t-1} + \beta_{10} \mathrm{DIR}_{t-1} + \beta_{11} \mathrm{IO}_{t-1} + \beta_{12} \mathrm{D}_{t-1} + u_{1t} \quad \textbf{(3.5)}$$

Where: n_1, n_2, n_3, n_4, n_5 and n_6 denoted as ARDL (n_1, n_2, n_3, n_4, n_5, n_6) are lags on first difference of zt chosen on the basis of certain information criterion (SIC, AIC).

The long-run effects normalized on Mt are captured by the estimated $ß_7$, $ß_8$, $ß_9$, $ß_{10}$, $ß_{11}$ and $ß_{12}$ coefficients. The short-run effects are reflected in statistically significant $ß_1$, $ß_2$, $ß_3$, $ß_4$, $ß_5$ and $ß_6$ coefficients. The error correction term is captured by a linear combination of the lagged level of all variables in z_t. Deterministic terms may be restricted or unrestricted (Pesaran et al., 2001). To detect the presence of co-integration among z_t, a decision must be made whether lagged levels of z_t should be retained or not. The idea is to test for the absence of the level relationship between import and their determinants by excluding lagged level z_t variables in equations (3.5). This is an explicit test for co-integration among z_t variables. Thus, a joint null hypothesis involving coefficients on lagged levels of z_t i.e. H_o: $ß_7 = ß_8 = ß_9 = ß_{10} = ß_{11} = ß_{12} = 0$ against the alternative H_1: $ß_7 = ß_8 = ß_9 = ß_{10} = ß_{11} = ß_{12} = 0$; is tested using the Wald or F-test statistic with critical values provided by Pesaran et al., (2001). The F-test has non-standard distribution.

Two asymptotic critical values are used to detect the presence of co-integration: one set corresponding to lower values purely for I(0) regressors and the other set for upper values purely for I(I) regressors while mutually co-integrated cases are also catered for by the bounds created by the two critical values. A conclusive decision about the null is made when the calculated F-statistic falls outside the critical value bounds. An inconclusive inference about the null exists when the calculated F-statistic falls within the critical value bounds. Thus, knowledge of the order of integration of the regressors in z_t is required in order to further examine the relationship in the inconclusive case. Co-integration is confirmed among zt variables if the F-statistic exceeds the upper critical value while the null of no co-integration cannot be rejected if the F-statistic is sensitive to the lag length for each differenced variable in z_t. Once co-integration is established, estimates of the long-run coefficients can be obtained and the ECM associated with the long-run estimates can also be estimated. The optimal lag length for each of the first differenced z_t variables is chosen based on the AIC and/or SBIC.

IV. RESULTS

4.1Pre-Estimation Results

Table 4.1: Descriptive Statistical Analysis

	LN(M)	P_m	LN(DI)	REXR	DIR	IO	D
Mean	23.65711	2.289261	24.91329	68.38384	12.50028	0.674588	0.833333
Median	23.42672	2.335841	24.53515	22.03070	12.75000	0.699434	1.000000
Maximum	25.23193	4.994211	27.06539	158.5526	26.00000	1.296835	1.000000
Minimum	22.16783	-0.274879	23.48328	0.546781	6.000000	0.298063	0.000000
Std. Dev.	0.907913	1.501787	1.090538	64.55728	4.315991	0.201458	0.377964
Skewness	0.338963	0.163426	0.762727	0.211178	0.785997	0.480010	-1.788854
Kurtosis	2.027465	2.010341	2.255365	1.233844	3.959064	4.294003	4.200000
Jarque-Bera	2.108110	1.629385	4.322236	4.946537	5.086454	3.894126	21.36000
Probability	0.348522	0.442775	0.115196	0.084309	0.078612	0.142693	0.000023
Sum	851.6559	82.41341	896.8786	2461.818	450.0100	24.28519	30.00000
Sum Sq. Dev.	28.85073	78.93773	41.62455	145867.5	651.9723	1.420488	5.000000
Observations	36	36	36	36	36	36	36

Source: Author, 2017

The table above showed that the means and medians of all the variables lie within the maximum and minimum values indicating that the variables had high tendency to be normally distributed. However, the Jaque-Bera test conducted for the normality test showed that imports of goods and services, import price, domestic income, real exchange rate, domestic interest rate and index of openness were normally distributed while dummy variable is not normally distributed since their tests were significant at 5% level. Surprisingly, these variables that were normally distributed were skewed positively while dummy variable is negatively skewed. The value of GDP kurtosis showed that the variable was imports of goods and services, import price, domestic income, real exchange rate were platykurtic while domestic interest rate, index of openness and dummy variable are leptokurtic. When a distribution kurtosis coefficient is greater than 3, the distribution is leptokurtic and when it has less than 3, is platykurtic.

Table 4.2: Correlation Matrix

	M	P_m	DI	REXR	DIR	IO	D01
M	1.000000						
P_m	0.088487	1.000000					
DI	0.057935	0.450582	1.000000				
REXR	0.026903	0.418169	0.452241	1.000000			
DIR	-0.483770	-0.457202	-0.487351	-0.146397	1.000000		
IO	-0.453943	-0.355076	-0.362375	-0.462439	0.480952	1.000000	
D	0.109835	-0.127714	0.183187	0.475497	0.472924	-0.100651	1.000000

Source: Author, 2017

In order to know that there is no multicolinearity among the explanatory variable, correlation analysis was carried out. Correlation also shows the degree of association among the variables. The results of the correlation matrix showed that none of the variables had perfect correlation coefficients. This was an indication that the model emanated from the set of the variables would not have any tendency for multicollinearity problem. Also, the degrees of linear association among the variables are weak relationship.

Table 4.3: ADF (Augmented Dickey Fuller) Unit Root Test Result

Level			Difference		Status
Variable	t*	ADF Critical Value	t*	ADF Critical value	
LN(M)	-5.423258	-2.948404			I(0)
P_m	-2.778186	-2.948404	-6.029371	-2.954021	I(1)
LN(DI)	0.611349	-2.948404	-5.309346	-2.951125	I(1)
REXR	-0.294918	-2.948404	-5.480777	-2.951125	I(1)
DIR	-2.778345	-2.948404	-6.316346	2.954021	I(1)
IO	-2.053728	-2.948404	-7.6102664	-2.951125	I(1)
D	-2.338498	-2.948404	-5.830952	-2.951125	I(1)

Source: Author, 2017

The time series behaviour of each of the series is presented in Tables 4.3, using the Augmented Dickey Fuller test (ADF) at both level and first difference of the series. The table reports that none of the time series data of import, import price, domestic income, real exchange rate, domestic interest rate and dummy variable have t-values greater ADF that is t* > ADF statistics indicating unit root and hence the application of the differencing technique. During the differencing import price, domestic income, real exchange rate, domestic interest rate and dummy variable variables became stationary at 1st difference as their t* < ADF statistics except import which was stationary at level and hence the generation of first difference data for the analysis. Given that the ADF test statistic of the variables at first difference < critical values at 5%, we conclude that there is no unit root with the time series except import. Since the orders of integration are 1(0) and 1(1), the autoregressive distributed lag (ARDL) bounds testing procedure will be used.

Table 4.4: ARDL Bounds Test for Co-Integration

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Testing for the existence of a level relationship among the variables in the ARDL model
*********************************************************************************
F-statistic 90% Lower Bound 90% Upper Bound 95% Lower Bound 95% Upper Bound
 5.8889             3.182         4.126           3.793         4.855
*********************************************************************************
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Source: Author, 2017

The ARDL bounds test for co-integration is used to know whether there is a long-run relationship and the benchmark is that if the F-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 bounds, the null hypothesis of no level effect can't be rejected.

Since the F-statistic of 5.8889 is above the upper bound of 4.855 at 5% level of significant, therefore, the empirical findings lead to the conclusion that a long-run relationship between import, import price, domestic income, real exchange rate, domestic interest rate and dummy variable exists.

Table 4.5: Long-Run ARDL Approach

Estimated Long Run Coefficients using the ARDL Approach
ARDL(1,2,0,0,0,2,1) selected based on Akaike Information Criterion

Dependent variable is M
34 observations used for estimation from 1982 to 2015

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
P_m	-.0045624	.034885	-.13079[.897]
DI	.91022	.0073124	124.4775[.000]
REXR	.9319003	.5761003	1.6176[.120]
DIR	-.018934	.0095522	-1.9822[.060]
IO	1.7443	.14888	11.7163[.000]
D	-.0024468	.11520	-.021240[.983]

Source: Author, 2017

From the long-run analysis, domestic income, domestic interest rate and index of openness are statistically significant in determining the import of goods and services in Nigeria. Therefore, both domestic income and index of openness exert a positive significant impact on import of goods and services in Nigeria while domestic interest rate exert a negative significant impact on import of goods and services in Nigeria in the long-run. A percentage change in both domestic income and index of openness will bring about 0.91% and 1.74% respective increase in import of goods and service while a percentage change in domestic interest rate will bring about 0.02% decrease in import of goods and service.

Table 4.6: Error Correction Mechanism ARDL Approach

Error Correction Representation for the Selected ARDL Model
ARDL(1,2,0,0,0,2,1) selected based on Akaike Information Criterion

Dependent variable is dM
34 observations used for estimation from 1982 to 2015

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
P_m	.010276	.016355	.62828[.536]
P_m1	.036972	.017162	2.1542[.041]
dDI	.64899	.080269	8.0852[.000]
dREXR	.6644003	.4015003	1.6548[.110]
dDIR	-.013500	.0061819	-2.1838[.039]
dIO	1.0345	.15604	6.6297[.000]
dIO1	-.33235	.11685	-2.8442[.009]
dD	-.35152	.10852	-3.2392[.003]
ecm(-1)	-.71300	.088354	-8.0699[.000]

R-Squared	.92404	R-Bar-Squared	.88606
S.E. of Regression	.085574	F-stat. F(8, 25)	33.4521[.000]
Mean of Dependent Variable	.033158	S.D. of Dependent Variable	.25351
Residual Sum of Squares	.16110	Equation Log-likelihood	42.7412
Akaike Info. Criterion	30.7412	Schwarz Bayesian Criterion	21.5830
DW-statistic	1.9983		

Source: Author, 2017

Having established the long-run relationship and co-movement among the variables, there was a need to examine the speed of adjustment that took all the variables to converge in the long-run. This test was done using error correction mechanism (ECM). The principle behind the result of the ECM was that the coefficient of the ECM must be negative and significance at 5% level. However, this would be used to calculate the speed of adjustment. That is, the time it takes the variables to converge in the long-run. Therefore, the coefficient of the ECM was negative and significant at 5% as evidence in the table 4.6 above. Hence, it took the variables 1.4 years (1/0.71300) to converge in the long-run.

This result had no serial correlation because the Durbin Watson statistics of 1.9983 is with the acceptable range and the overall model was statistically significant at 5% level with a figure of 33.4521 ($p<05$). Also, the explanatory power of the model explained 88% of the total variations in import of goods and services. Hence, the model had high goodness of fit.

Also, it was observed that import prices, domestic income, domestic interest rate, index of openness and dummy variable are the major determinant of import in the short-run. Import prices, domestic income and index of openness exert a positive significant impact on Nigeria import indicating that percentage change both import prices, domestic income and

index of openness will lead to an increase of 0.04%, 0.65% and1.03% respectively in import of goods and services in Nigeria. In the same vein, index of openness in one year lag and a dummy variable exert a negative significant effect on import of goods and services in Nigeria. In one year lag of economy openness in Nigeria in the short-run, import of goods and services will decrease by 0.33%. The value of the coefficient of the dummy variable is appropriately signed and statistically significant, meaning that in the short-run, SAP must have achieved one of its cardinal objectives of significant reduction in import of goods and services in Nigeria through exchange rate depreciation. The coefficient of real exchange rate was positive indicating depreciation of our currency.

Lastly, the inferences that can be drown from the result of both the short-run and the long-run is that the price elasticity of import is inelastic in both the short-run and long-run while income elasticity indicate that our import are normal goods. Openness in the short-run discourages import while openness in the long run encourages import.

. Table 4.7: Diagnostic Test

Diagnostic Tests

Test Statistics	LM Version	F Version
A:Serial Correlation	CHSQ(1)= .077930[.780]	F(1, 21)= .048244[.828]
B:Functional Form	CHSQ(1)= .069387[.792]	F(1, 21)= .042944[.838]
C:Normality	CHSQ(2)= 1.5119[.470]	Not applicable
D:Heteroscedasticity	CHSQ(1)= .023549[.878]	F(1, 32)= .022179[.883]

Source: Author, 2017

The diagnostic test showed that the serial correlation is insignificant in the LM version and also insignificant in the F version, so we can assume that there is no auto-correlation according to the LM and F version. Similarly the functional form is insignificant (no issue); normality is insignificant (no issue) and hetroskedasticity is insignificant (no issue). Hence there is no apparent issue with the model.

V. DISCUSSION, CONCLUSION AND RECOMMENDATIONS

Excessive importation of goods and services has serious implications for macroeconomic stability through imported inflation. It can also engender balance of payments disequilibrium and impinge on the credit rating of a country. Excessive importation can also lead to a drain on foreign exchange reserves and further worsen the balance of payments position. Therefore the study investigated the determinants of import in Nigeria over the period 1980 to 2015. The study employed expost facto research design. Secondary time series data were used for the study and these were sourced from World Integrated Trade Solution (WITS, 2013) Database and World Development Indicator (WDI, 2016). The data collected were analyzed using autoregressive distributed lag. The inferences were drown at 5% significance level. The result showed that domestic income and index of openness exert a long-run positive and significant impact on import of goods and services in Nigeria ($\beta = 0.91022$, $t = 124.4775$ and $\beta = 1.7443$, $t = 11.7163$ respectively) but domestic interest rate exerts a long-run negative and significant impact on import of goods and services in Nigeria ($\beta = -0.08934$, $t = -1.9822$). While import prices, domestic income and index of openness exert exert a short-run positive and significant impact on import of goods and services in Nigeria ($\beta = 0.036972$, $t = 2.1542$; $\beta = 0.64899$, $t = 8.0852$ and $\beta = 1.0345$, $t = 6.6297$ respectively). The value of the coefficient of the dummy variable is appropriately signed and statistically significant, meaning that SAP achieved its cardinal objectives of significant reduction in import of goods and services in Nigeria through exchange rate depreciation. The study concluded that trade openness in the short-run discourages import while openness in the long run encourages import. Most of the good imported are inelastic in nature during the period selected and they are normal goods. The study recommended that recalibration of the naira since devaluation or depreciation of the domestic currency which was the main ingredient of SAP did not work and this will improve the competitiveness of exports. It will also help to improve Nigeria's trade balance with its trading partners by making imports of machineries and equipments less expensive.

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