Price and Income Elasticity of Import Demand in Nigeria

OBI, Chinasa Ifeoma

Department of Economics, Nnamdi Azikiwe University Awka

Abstract: This study investigated the price and income elasticity of import demand in Nigeria using data for the period of 1981-2020, the objective were to: Determine the effect of import price on import demand in Nigeria. Determine the effect of domestic income on import demand in Nigeria. Error correction model were used (ECM) method of data analysis was adopted because of its Best Linear Unbiased Estimators (BLUE) properties. The data for the variables used were sourced from Central Bank of Nigeria Statistical Bulletin. The study adopted the unit root test, co-integration approach, Heteroscedasticity test as well as Error Correction Mechanism to analyses the corrected data. E- View software was used for the analysis. The study found that. There exists positive and significant relationship between real gross domestic product and import demand in Nigeria. A positive but insignificant relationship exists between relative prices of imports and import demand in Nigeria. A positive but insignificant relationship exists between trade openness and import demand in Nigeria. The study recommends that since domestic prices determine import demand, government should try to minimize the effect of inflation in domestic economy. Government should try to check import demand by way of employing import substitution policy so that locally produced goods will substitutes imported goods. Gross elastic perfect substitutes: the goods imported are necessary goods for instance capital goods. This makes Nigeria to be more import dependents. Therefore policies that will favour import dependent country should be advocated for

Keywords: price, income elasticity, import, demand, price and income elasticity of import demand

1.1 Introduction

Income and price elasticities of imports refer to the degree of responsiveness of imports to any slight change in the income and prices of imports. Here, the price of imports is usually the relative prices, while the income is the real gross domestic product (Nwogwugwu, Maduka, & Madichie, (2017). The income and price elasticities of imports are very crucial for both economic forecasting and trade policy analysis. Thus, a number of studies have attempted the estimates of income and price elasticities of imports and other related issues across countries of the world. However, the values of the income and price elasticities of imports remained a subject of diverse opinion in most international economic policy debates. This is due to the fact that most of these empirical studies continue to show conflicting results (Danjuma 2020).. Also, there appears to be dearth of empirical studies that have undertaken a systematic estimation of income and price elasticities of imports using Nigerian data. Nigeria as a developing country

is facing the challenge of external imbalance cropping up from a persistently growing current account deficit. This occurs as a result of the huge deficits in merchandize trade, Nwogwugwu, Maduka and Madichie (2017). However, trade volume and hence the associated potential revenue generation from trade-based taxes depends on the price and income elasticities of exports and imports (Udayanthi Tennakoon, 2010). Therefore, to formulate or implement a policy related to foreign trade, it is very important to have a clear picture on the export and import demand determinants and their elasticity. The presentation here focuses on import policy, rather than exports since the 1980s. Various measures of protective trade policies have over the years favored Nigeria which ranges from import substitution industrialization to haphazard application of tariff via annual budget Nwogwugwu et al. (2017). Obtaining the estimates of the income and price elasticities of imports can be of great use in gauging the effect of changes in the economy as well as of fiscal and monetary policy measures on trade balance Nwogwugwu et al. (2017). These elasticities can be used in macro economic forecasting as they help describe the inter-relationship between variables of interest and thus, determine the intensity of the effect of fiscal and monetary policy measures Nwogwugwu et al. (2017) Also, the potency of any trade policy adopted by any economy depends largely on the trade elasticities of that economy [price and income elasticities of import and export].

Elasticity of import demand is useful to making policy decisions on optimal trade taxes, currency devaluation to improve the balance of trade, estimation of the government revenue from trade related taxes and estimation of the fiscal implications of trade liberalization (Udayanthi Tennakoon, 2010)

Elasticity of import demand is useful to making policy decisions on optimal trade taxes, currency devaluation to improve the balance of trade, estimation of the government revenue from trade related taxes and estimation of the fiscal implications of trade liberalization (Udayanthi Tennakoon, 2010)

1.2 Problem Statement.

It is not surprising that the crash of commodity exports prices in the early 1980s and recently from 2014 engendered fiscal crisis in Nigeria cumulating in huge extra budget spending as currently experienced in the country. This led to the introduction of catalogues of economic reform projects/strategies such as the import substitution industrialization (ISI) strategy, export promotion programme (export free zones), Structural Adjustment Programme (SAP) to mention but a few. These strategies were expected to boost export and reduce imports to restore external balance and stimulate economic growth. However, imports demands in Nigeria kept escalating over the years. For instance, the value of non-oil imports trade grew from a mean value of N36.55 billion; representing 96.8% of total import into Nigeria within the duration 1970-1979, to N118.36 billion; representing 93.4% of aggregate import trade during duration 1980-1989, N3.48 trillion in the period 1990-1999; representing 79.9% of aggregate import trade and N19.33 trillion; representing 82.0% of aggregate imports trade for the duration 2000-2008 (World Bank 2012). The latest value for Imports of goods and services BOP, current US$ in

Nigeria was $85,354,940,000 as of 2014 (World Bank, 2014). These programmes and policy measures sought to reduce external disequilibrium while strengthening production capacity. These were among the principal measures implemented locally to bring about trade balance, the policies attempted to influence imports. The authorities also became more preoccupied with mobilizing external financial assistance, thereby incurring debt. The debt burden, however, has engendered a decrease in public investment spending and an increase in budgetary deficits. Nigeria has also undergone real devaluation and undertaken substantial trade liberalization in an effort to improve its balance-of-payments situation. This has necessitated this study to determine the price and income elasticities of import demand and their effect on trade balance.

1.3 Research Question

Contending with the problem under investigation, the research was geared toward answering the following questions:

- How has import price affected import demand in Nigeria?
- How has domestic income affected import demand in Nigeria?

1.4 Objectives of study

The general objective of the study is to determine the price and income elasticity of import demand in Nigeria. Specifically, the study tends to:

- Determine the effect of import price on import demand in Nigeria.
- Determine the effect of domestic income on import demand in Nigeria.

REVIEW OF LITERATURE

2.1 Theoretical Literature

Theory of trade

The theoretical linkage between trade openness and imports has been explained by a range of theories, however there are three leading theories that explain demand for imports. First, is the theory of comparative advantage or neoclassic trade theory, second is the perfect substitute's model or Keynesian trade multiplier and third is the imperfect competition theory also known as the new trade theory Harvey, S. and Sedegah, K. (2011) and Mah, J.S. (1999)

The first theory is the comparative advantage theory, the theory focuses on how the volume and direction of international trade are affected by changes in relative prices. The volume and direction of trade are explained by differences in factor endowments between countries. The theory is not concerned with the effects of changes in income on trade as the level of employment is assumed to be fixed and output is assumed to be on a given production frontier.

This suggests that import demand is based on the assumptions of neoclassic microeconomic consumer behavior and general equilibrium theory. The models predict that movement towards openness can temporarily increase imports due to short run gains from re-allocation of resources within the economy. The implication is that trade openness has a positive relationship with imports Santos-Paulino, A. and Thirlwall, A.P. (2004).

The second theory is the perfect substitute's model or Keynesian import demand function, which is based on the macroeconomic multiplier analysis. In this model, relative prices are assumed to be rigid while employment is variable. The model assumes international capital movements which passively adjust to restore the trade balance. The relationship can be defined by the average and marginal propensity to import and the income elasticity of imports. The perfect substitute's model is based on the assumption that traded goods are perfectly substitutes. But in reality, traded goods are not perfect substitutes hence both imported goods and locally produced goods coexist in the same market Harvey, S. and Sedegah, K. (2011).

The theory assumes that the state intervenes in international trade through the use of trade controls. The theory is based on the assumptions that traded goods are perfectly substitutable and can be traded across countries. The theory further assumes that international capital movements will passively adjust to restore the trade balance and it identifies two mechanisms in which trade openness might affect imports Santos-Paulino, A.et al.(2004). The first one is the domestic source path, this is associated with innovation while the second one is through absorption of foreign technology from leading trading partners. In the domestic source path, the rate at which imports grow depends on the rate of ingenuity of human capital or innovations in the domestic economy. In the second approach growth in imports depends on how imitation of foreign technology or capital is absorbed in the country Harvey, S. et al. (2011)

The third theory is the imperfect competition theory. The theory focuses on intra-industry trade and explains the effects of economies of scale, product differentiation and monopolistic competition on international trade. The theory uses three approaches to try and define effects of imperfect competition on international trade these include the Marshallian, Chamberlinian and Cournotapproaches. First the Marshallian approach assumes constant returns at the firms level but increasing returns at the industry level, secondly the Chamberlinian approach assumes that an industry consists of many monopolistic firms and new firms are able to enter the market and differentiate their products from existing firms so that any monopoly profit at the industry level is eliminated. Lastly the Cournot approach assumes a market with only a few imperfectly competitive firms where each firm output is taken as given Abuka, C.A. and Ddamulira, D.M. (1999).

The theoretical literature suggests three theories that influence import demand, however two theories are commonly used in estimating the import demand function. These are the imperfect substitute model and the perfect substitute model Abuka, C.A. and Ddamulira, D.M. (1999). The perfect substitute's model is based on the assumption that traded goods are perfect substitutes, suggesting that a country can be either an importer or an exporter but not

both Weiss, J. (1995).But in reality, traded goods are not perfect substitutes hence imported goods and locally produced goods coexist on the same market. Furthermore, the increasing trade among nations and existence of intra-industry trade have put question marks on the validity of the perfect substitute's hypothesis. The perfect substitute's model has attracted less attention in the empirical studies since it seems to be less realistic while the imperfect substitution model has received more Harvey, and Sedegah, (2011). The theories assume that in a market economy import demand can be fully modeled by income and relative prices.

2.3. Empirical Literature

A large body of empirical literature exists on the study of import function for both developed and developing countries. Bahmani-Oskooee and Niromand (1998) using annual data (1960-1992) examined the import demand functions of 30 countries through the aggregate model by using the Johansen-Juselius (J.J) co-integration tests. The results show that twenty six of these countries had co-integrating relationship between the import demand function and its determinants in the long run. In most cases the price elasticities and income elasticities were high. The study however did not investigate the short run dynamics. Similarly, Mohammed and Othman (2001) examined the long run relationship between imports and expenditure components of five Asian Countries (Malaysia, Indonesia, the Philippines, Singapore and Thailand). Using the same methodology with a disaggregated model and annual data for the period 1968-1998 (Except Singapore, with a shorter period 1974-1998), they concluded that the import demand was co-integrated with its determinants for all five countries.

Dutta and Ahmed (2001) used the Johansen-Juselius (J.J) co-integration test investigate the behaviour of import demand for India during the period 1971-1995. They concluded that the aggregate import volume is price-inelastic with elasticity of -0.47; while income elasticity of demand for imports was elastic with a coefficient of 1.43. Abbott and Seddighi (1996) also using the Johansen-Juselius (J.J) approach but with disaggregate model, estimated the import demand function for the UK. They concluded that import demand was co-integrated with its determinants with consumption expenditure having the largest impact on import demand (1.3). Mohamed and Tang (2000) also using the Johansen-Juselius (J.J) co-integration methodology studied the determinants of aggregate import demand for Malaysia, over the period 1970-1998. Their result revealed that all the disaggregated components had an inelastic effect on import demand in the long run with investment expenditure and consumption expenditure having the largest impact on import demand i.e. 0.78 and 0.72 respectively. HO (2004) though using the same methodology, estimated the import demand function of Macao by testing both the aggregate and disaggregate import demand models. His studies which used quarterly data for the period 1970-1986, observed that co-integrating relationships exists in the disaggregate model wholes no co-integration was found in the aggregate model of Macao's import demand function. He concluded that disaggregate model is more appropriate in explaining the import demand of Macao. Babatude and Egwaikhide (2010), empirically analyzed the aggregated import demand behaviour for Nigeria using annual data between 1980 and 2006. The bound test analysis was used to estimate the long-run relationship between import demand and its

determinants. The study found that import, income, and relative prices are co-integrated. Also, the estimated long run elasticities of import demand with respect to income and relative prices were 2.48 and -0.133.

Abutia (2004), estimated the price and income elasticities of international trade for Jordan between 1980 and 2012. The study employed ADF units root, Johnson co-integration and error correction mechanism. The study showed that the sum of price elasticites of import and export demand exceeds one for Jordan. Mohammed et al. (2000 examined the long relationship between Malaysian real imports and the underlying components of final demand expenditure proxied by real final consumption expenditure, investment expenditure and exports and relative prices during (1970-1988) via Johansen Multivariate co-integration analysis (Johasen 1998, and Johansen et al, 1990). An ECM is estimated to evaluate the short run response of imports to its determinants. The result shows that only one co-integrating vector is found, which means that the partial elasticities of imports are 0.72, 0.78 and 0.385 respectively. The import price is fairly inelastic at -0.69. in the ECM estimation, it is discovered that the speed of adjustment implied by the one period lagged ECT is -0.637, which is quite fast. The specification of ECM, dropped out the effect of final consumption expenditure as its effect is statistically insignificant to import. Frimpong and Oteng-Abayie (2006) studied the behaviour of Ghana's imports demand during the period of 1970-2002 using disaggregated model and the bound test approach to co-integration. They found co-integration among elements of the import demand relationship. Their study revealed an inelastic import demand for all the expenditure components and relative prices. They asserted that in the long run, investment and exports were the major determinant of imports in Ghana but in short run , household and government consumption expenditures were the major determinant of import demand. They claimed that import demand was not very sensitive to price changes.

Uche et al (2015) examined the price and income elasticities of import demand in Nigeria; evidence from the bound testing proposed by Pesaran et al; (2001) to study the long run relationship between variables of interest. The results of the units root test based on ADF and PP provide justification for the use of ARDL bound test as the variables were either 1 (0) or 1 (1) and none is 1 (2).the co-integration result show that there is a long run relationship between import demand and the chosen explanatory variables, thus, all the variables move together in the long run. The estimate long run coefficients show that the price and income elasticities of import demand in Nigeria were about 0.03 and 0.55 respectively during the period covered. This implies 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 determinants of import demand in Nigeria. The long run coefficient of domestic prices which is also regarded as the cross price elasticity of import demand with respect to home made goods was about 0.0062 and statistically insignificant, thus, there is evidence of imperfect substitution between foreign made goods and domestically produced goods. The result 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. They therefore, conclude that the use of currency derivation as an import substitution tools is not validated by their results, where as the use of higher taxes and interest rate as a tool of expenditure switching policies should be expected to have shared impact on Nigeria's trade balance.

METHODOLOGY

3.1 Theoretical Framework

In this paper, the model to be adopted to study import demand is based on consumer demand theory in the context of imports for a country. Khan (1974), Hemphill (1974), Ozo-Eson (1984) and Narayan (2005) provide a theoretical basis, as discussed in the previous section. In analyzing import demand, we study one of the behavioural relationships in economic theory. This relationship is an aggregate of the individual behaviour of a given country, state, and/or territory (Olayide, 1968). The simplest formulation of an aggregate demand equation relates the quantity of imports demanded to the ratio of import prices to domestic prices (assuming a degree of substitutability between import and domestic goods) and to domestic real income, all in period (Khan, 1974)adopted equation system for aggregate import demand, based on economic theory is

Mit = f(Yt, PMit, PDit)...……........3.0

Where Yit denotes the real gross domestic product; Mit denotes the quantity or volume demanded of the ith commodity; PMit the price of the ith import commodity; PDit denotes the price of the ith domestic commodity.

3.2 Model Specification

As has been established in the theoretical framework, this study is based on imperfect substitution model provided by Khan (1974) and has been used by Bobic (2009). Hence, the import demand function as defined in Khan'sequationis based on the theory. Equation (3.0) is the framework most commonly used in empirical studies of import behaviour. Based on equation (3.0) we specify our model as:

$$IMP = \alpha_0 + \alpha_1 RGDP_t + \alpha_2 RLP_t + \alpha_3 OPN_t + \alpha_4 EXR_t + \alpha_5 CPI_t + \mu_t \dots\dots\dots\dots\dots(3)$$

Where IMP = Import demand

RGDP = Real Gross Domestic Product, used to proxy domestic income

RLP = Relative Prices of import

OPN = Trade Openness (measured as export plus import divided by GDP) used as a proxy for volume of trade.

EXR = Exchange rate

CPI = Consumer Price Index (domestic price)

μ = Random Error Term

$\alpha_{(0)}$ = Intercept term

$\alpha_{(1)}$ - $\alpha_{(5)}$ = Parameters to be estimated

t= the period which measures the current term under estimation.

Adopting a Log-Linear Specification, our model becomes:

$$LIMP = \alpha_0 + \alpha_1 LRGDP_t + \alpha_2 LRLP_t + \alpha_3 LOPN_t + \alpha_4 LEXR_T + \alpha_5 LCPI_t + \mu_t \dots\dots\dots\dots(4)$$

Where L = natural logarithm. Note that the presence of log on both sides of the equation (4) implies that the parameters, $\alpha_{(1)}$ - $\alpha_{(5)}$ are to be interpreted as elasticities. A priori expectation; $\alpha_1 > 1$, $\alpha_2 < 0$, $\alpha_3 > 0$, $\alpha_4 < 0$, $\alpha_5 > 0$.

3.3 Method of Estimation

In order to estimate objectives, the study uses multiple regression and employs ordinary least square (OLS) estimation technique. The OLS is favoured because of its Best linear Unbiased Estimators (BLUE) properties. Thus, the estimation commences with a unit root test to confirm the stationarity states of the variables that entered the model. In order to test for stationarity of the data used in this study, the Augmented – Dickey Fuller (ADF) test will be used. The first step is to test for stationarity at level, without constant and trend. If the variables are non – stationary, then the next step is to difference and test for the stationarity of differenced variables. If the variables become stationary after first difference then it is concluded that the variables are integrated of order one i.e. I (1).After that, the Error Correction Model (ECM)will be estimated by applying the ECM version of ADF where the speed of adjustment to long run and short run equilibrium will be determined. Other statistical tests conducted are outlined thus:

3.4 Statistical Test(first Order)

Under the statistical test, first order, we will test for the goodness of fit, the individual significance of each regressor using the t-test and finally the significance of the regression model using the F-test.

a) Goodness of fit test (R^2): we shall make use of the coefficient of determination R^2 to find how well the sample regression line fits the data. R^2 measures how the variation in the explanatory affects the dependent variable.

b) Student's t-test: this is used for testing the significance of the variables in the model. 5% level of significance will be used, with n - k degree of freedom and where necessary, the

probability value will be used as a rule of thumb. Where a = 0.05 (n-k), n = number of observation (sample size), k = total number of estimated parameters.

c) The F-test: this will be used for testing the overall significance of the regression model. The regression might not have individual influence on the dependent variable except in conjunction with other regressors, that's the essence of the f-test. 5% level of significance will be used with (k - 1)(n - k) degree of freedom where V_1= k - 1, V_2 - n

3.5 Econometric Test (Second Order)

a) Autocorrelation Test: The classical linear regressions model assumes that auto correlation does not exist among the disturbance terms. In other to find out whether the error terms are correlated in the regression, we will use the Durbin-watson (DW) statistics.

3.6 Sources of Data

The data set for the analyses comprises of Imports, RGDP, Relative prices, exchange rate, Trade Openness, and consumer price index. These data were obtained from officially recognized national data sources such as Central Bank of Nigeria (CBN) which is the primary World Bank and the United Nation Commission for Trade and Development (UNCTAD).

SECTION FOUR

4.1. Presentation and Analysis of Results

Unit Root Test

The analytical techniques discussed in the previous chapter were applied to the models of the study and the results are presented in this section. Since empirical analysis based on time series data would be biased if the underlying data are non stationary, the unit root test is therefore necessary to check for the stationarity of the variables. As earlier noted, the test used for observing the stationarity of the time series data used for analysis in this study is the Augmented Dickey-Fuller (ADF) test. The results are summarized in table 4.1 below.

Table 4.1 Summary of ADF unit root test result

Variables	ADF statistics	Order of Integration	Remarks
D(CPI,2)	-8.304652	1(2)	Stationary at second difference
D(EXR)	-5.866679	1(1)	Stationary at first difference
D(LIMP)	-6.531719	1(1)	Stationary at first difference

D(LRGDP,2)	-6.752642	1(2)	Stationary at second difference
D(OPN)	-5.513427	1(1)	Stationary at first difference
D(PCI)	-4.524749	1(1)	Stationary at first difference
D(RLP)	-7.768164	1(1)	Stationary at first difference
D(ECM)	-5.492718	1(1)	Stationary at first difference

Source: Researcher's compilation using Eview 10 (2022).

As seen in table 4.1, exchange rate, imports, trade openness, per capita income and relative prices of imports were stationary at first difference while consumer price index and real gross domestic product were stationary at second difference. The ECM was stationary at first difference. This provides a strong criterion for the co-integration analysis.

Co-integration Test

Since short run equilibrium has been revealed to exist among the series, there is the need to investigate the existence or otherwise of long run equilibrium among these series. This test will be done using the Johansen co-integration test.

Hypothesis:

H_0: The variable does not co integrate

H_1: The variable co-integrates.

Decision Rule

Reject the null hypothesis if the trace statistic > the 5% critical value or if the probability value < 0.05. The co-integration test table is presented below:

Table 4.2: Co-integration result

Hypothesized No. of CE(s)	Eigen value	Trace statistic	0.05 critical value	Prob**
None*	0.801414	169.9910	125.6154	0.0000
At most 1*	0.690279	113.4123	95.75366	0.0018
At most 2*	0.588285	72.38943	69.81889	0.0307
At most 3	0.368660	41.49922	47.85613	0.1733
At most 4	0.344982	25.40232	29.79707	0.1476
At most 5	0.246880	10.59405	15.49471	0.2377
At most 6	0.018974	0.670473	3.841466	0.4129

Source: author's computation using Eviews 10 (2022)

From table 4.2 above, it is evident that there are three co-integrating equations in the series. Hence we reject the null hypothesis. To confirm the existence of this long run equilibrium, we look at the maximum eigen value result as presented in the table below:

Table 4.3: Maximum Eigen value

Hypothesized No. of CE(s)	Eigen value	Max-Eigen statistic	0.05 critical value	Prob**
None*	0.801414	56.57867	46.23142	0.0029
At most 1*	0.690279	41.02289	40.07757	0.0390
At most 2	0.586285	30.89022	33.87687	0.1091
At most 3	0.368660	16.09690	27.58434	0.6575
At most 4	0.344982	14.80827	21.13162	0.3025
At most 5	0.246880	9.923582	14.26460	0.2170
At most 6	0.018974	0.670473	3.841466	0.4129

Source: author's computation using Eviews 10 (2022)

From table 4.3 above, it is evident that there are two co-integrating equations in the series. Hence we also reject the null hypothesis.

Since the short run and long run relationships alone do not explain the nature of relationships between variables, it is therefore necessary to combine both the short run and long run components in order to ascertain the speed of adjustment and the level of disequilibrium/discrepancies in the previous period that were actually corrected in the present period. This therefore necessitates the error correction model. Again, to determine the maximum lag length of the regressors so as to enable a parsimonious regression result, the optimal lag selection criteria was adopted and lag 1 was adopted as the maximum lag using the Akaike Information criteria as evidenced in the table below:

Table 4.4: Optimal lag length selection criteria

Lag	logL	LR	FPE	AIC	SC	HQ
0	-470.8567	NA	1704.572	27.30610	27.61717	27.41348
1	-182.9328	444.2255*	0.002124*	13.65330*	16.14186*	14.51236*
2	-140.9851	47.94026	0.004540	14.05629	18.72234	15.66701

Source: Author's compilation (2022) **Where * indicates lag order selected by the criterion**

As evidenced in table 4.4 above, all the selection criteria selected the lag order of 1. This therefore necessitates the adoption of lag 1 as the maximum lag length for the ECM analysis which shows the short run dynamics of the model as presented in the table below:

4.2.2: ECM Regression Result

Table 4.5: Summary of the ECM regression result: Dependent Variable- D(LIMP)

Variables	Coefficient	Std. Error	t-statistic	Prob.
C	-3.839582	3.490975	-1.099860	0.0008
D(LRGDP(-1))	0.793233	0.819360	2.212206	0.0026
D(OPN(-1))	0.380121	0.618747	1.392124	0.0837
D(PCI(-1))	0.621005	0.000122	2.337424	0.0383
D(RLP(-1))	0.280669	0.129384	1.169280	0.2487
D(CPI(-1))	-0.600880	0.004738	-3.185783	0.0040
D(EXR(-1))	-0.500975	0.001255	-2.776984	0.0437
ECM(-1)	-0.541879	0.087924	-3.613661	0.0178
R^2= 0.967607	F stat= 5.325179	R^2Adj= 0.959509	F proby=0.00090	

Source: Researcher's compilation using Eview 10 (2022)

Moreover, our main interest is on the results of RGDP, RLP and CPI .The short run coefficients of these variables of interest –LRGDP, LRLP and LCPI, which proxies' domestic income, import price and price of domestically produced goods are income and price inelastic. The results imply that import demand in Nigeria is price and income inelastic. This is so because the short run price and income elasticitics of import price and domestic income are 0.28 and 0.79 respectively which are less than one.

Furthermore, a one percent increase in the price of domestic goods will lead to 0.062 percent increase in import demand .This implies that domestic goods are not perfect substitutes for foreign goods .Finally domestic income and prices of domestic goods are statistically significant implying that domestic income and prices of domestic goods determines the import demand. While the relative import prices are not significant. This also shows that it is the prices of import that determines the demand for import in Nigeria, rather, it is the domestic income, and prices of domestic goods.

The coefficient of -0.500975 for exchange rate shows that a unit change in the previous value of exchange rate will decrease import demand in the present period by about 50%.

B. Heteroscedasticity Test

The White general Heteroscedasticity test which follows the chi-square distribution with degree of freedom equals the number of regressors was used to test whether the error variances are

equal or unequal. The choice of the White test is that it is more standard and general than other tests of heteroscedasticity.

The hypothesis to be tested are:

H$_0$: β$_1$ = β$_2$= β$_3$ = β$_4$ = β$_5$ = β$_6$ = β$_7$ = β$_8$ = β$_9$ = β$_{10}$= β$_{11}$ = β$_{12}$ = 0 (homoscedasticity)

H$_1$: β$_1$ ≠β$_2$ ≠β$_3$ ≠β$_4$ ≠β$_5$ ≠ β$_6$ ≠β$_7$ ≠β$_8$ ≠ β$_9$ ≠ β$_{10}$ ≠β$_{11}$ ≠β$_{12}$ ≠0 (heteroscedasticity)

Decision rule

Reject the null hypothesis if the chi-square calculated is greater than the critical chi-square at 5% level of significance or the P-value < 0.05. Accept if otherwise.

The heteroscedasticity table is given below.

Table 4.6: Heteroscedasticity test

				Decision
F statistic	0.594630	Probability	0.7321	Accept
Obs* R-squared	3.932579	Probability	0.6858	Accept

Source: Author's computation (2022)

From table 4.9 above, it can be observed that the P value of 0.6858 is > 0.05. Hence, we accept the null hypothesis and conclude that there is homoscedasticity in the series.

SECTION FIVE
SUMMARY, RECOMMENDATIONS AND CONCLUSION

5.1 Summary
The major findings of this study are summarized and discussed below:
1. There exists positive and significant relationship between real gross domestic product and import demand in Nigeria. This implies that as the economy grows, there is a tendency for import demand to increase given that economic growth culminates into higher aggregate demand and as such, higher import demand.
2. A positive but insignificant relationship exists between relative prices of imports and import demand in Nigeria. This implies that the higher the relative prices of imports, the higher the imports demand in Nigeria, though the increase in import demand is not significant. This follows from the fact that a higher relative price of imports means that more units of import can be exchanged for one unit of export.
3. A positive but insignificant relationship exists between trade openness and import demand in Nigeria. This implies that increased trade openness brings about an insignificant increase in imports demand in Nigeria. Since trade openness shows he impact of a country's international trade on the home economy, it then follows that the

higher this positive impact, the more such a country would want to engage in trade, and hence, more demand for imports.

4. There is a negative and significant relationship existing between exchange rate and imports demand in Nigeria. This implies that higher exchange rate (lower value of the home currency) decreases imports demand in Nigeria since lower value of the home currency makes exports relatively cheaper than imports, thereby increasing exports and reducing imports demand.

5. Again, there exists a negative and significant relationship between the consumer price index and imports demand in Nigeria. This implies that as the price per basket of good increases in Nigeria, leading to increased rate of inflation, there tend to be a decline in the demand for imports since such high level of inflation leads to a fall in the value of the home country's currency relative to the foreign currency and as such, a unit of the home currency could buy less of foreign good.

6. Finally, a positive and significant relationship exists between per capita income (domestic income) and imports demand in Nigeria. This implies that as the income per head of the population increases, this leaves more money at the disposal of the consumers. Thus an increase in aggregate demand sets in, leading to an increased imports demand.

5.2. RECOMMENDATION

1. Since domestic prices determine import demand, government should try to minimize the effect of inflation in domestic economy.
2. Government should try to check import demand by way of employing import substitution policy so that locally produced goods will substitutes imported goods.
3. Gross elastic perfect substitutes: the goods imported are necessary goods for instance capital goods. This makes Nigeria to be more import dependents. Therefore policies that will favour import dependent country should be advocated for.

5.3 CONCLUSIONS

1. Real gross domestic product in Nigeria increases imports demand.
2. Increases in the relative prices of imports increases imports demand in Nigeria, though to an insignificant extent.
3. Domestic goods are not perfect substitute for foreign goods.

Finally, we conclude that import demand in Nigeria is price and income inelastic.

From the above, it is evident that the demand for imports in Nigeria is responsive to the relative prices of imports and the domestic income.

REFERENCE

Abbott, A. J. and Seddighi, H. R., (1996) 'Aggregate imports and expenditure components in the UK: an empirical analysis'. Applied Economics Vol.28, pp. 1119-1125.

Babatunde, M. A. and Egwaikhide, F. O. (2010). Explaining Nigeria's Import Demand Behaviour: A Bound Testing Approach, *International Journal of Development Issues*, Vol. 9, No. 2, pp 167-187

Bahmani-Oskooe et al (1998) Trade policy reform in developing countries since 1985; A Review of the Evidence. World Bank discussion paper

Bobic, V. (2009). Income and Price Elasticities of Croatian Trade – A Panel Data Approach. Young Economists' Seminar to 15th Dubrovnik Economic Conference Organised by Croatian National Bank.

Central Bank of Nigeria Statistical Bulletin, 2016 and World Bank's World Development Index.

Chenery, H.B. and A. Strout. (1966) Foreign Assistance and Economic Development. The American Economic ReviewVol. 56, No. 4, Part 1 (Sep., 1966), pp. 679-733

Desai, D and Potter, R.B (2008). The companion to Development studies. Hodder Education, UK

Dutta, D. & N. Ahmed (2006). An aggregate import demand function for India: a cointegration analysis. Sydney School of Economics and Political Science, University of Sydney NSW 2006 Australia.

Dutta, D. & N. Ahmed (2001). An aggregate import demand fund for india: A cointegration analysis (http:eprints.anu.edu.au/archive/00001731/)

Ekuerhare, B. U. 1980. "The impact and lessons of Nigeria's industrial policy under the military government, 1966–1979", Nigerian Economic Society Proceedings, pp. 199–223.

Forrest, T. 1982. "Recent development in Nigerian industrialisation". In M. Fransman, ed., Industry and Accumulation in Africa . London: Heinemann.

Frimpong, J.M. and Oteng-Abayie, E.F. (2006) ' Aggregate import demand and expenditure components in Ghana an econometric analysis', MPRA Paper, No. 599q

Harvey, S. and Sedegah, K. (2011) Import Demand in Ghana: Structure, Behaviour and Stability. AERC Research Paper 233.

Hemphill, W.L., 1974. "The Effect of Foreign Exchange Receipts on Imports of less Developed Countries." IMF Staff Papers, No. 21.

Johnsen S. and K. Juselius (1990) Maximum likelihood estimation and inference on cointegration with application to the demand for money. Oxford bulletin of economics and statistics vol 52:269-270

Johansen, S. and K. Juselius (1990). Maximum Likelihood Estimation andInference on Cointegration with Applications to the Demand for Money. Oxford Bulletin of Economics and Statistics, 52: 169-210.

Johansen, S.and K. Juselius (1992). Testing Structural Hypothesis in a MultivariateCointegration Analysis of the PPP and the UIP for UK.

Johansen, S. and K. Juselius (1994). Identification of the Long-Run and the Short-Run Structure: An Application to the ISLM Model.Journal of Econometrics,63: 7-36.

Khan, M., 1974. " Import and Export Demand in Developing Countries." IMF Staff Papers, No. 21:678-92.

Mah, J.S. (1999) Import Demand, Liberalization and Economic Development. Journal of Policy Modelling , 21, 497-503.

Mckinnon, R.I. (1964) Foreign Exchange Constraints in Economic Development and Efficient Aid Allocation, Economic Journal, vol. 74: 388–409.

Mohamed, H. A., and Othman, J. (2001) 'Aggregate import demand and expenditure components in five ASEAN countries an empirical study', Journals Ekanari Malaysia Vol. 35, pp. 37-60

Mohammed, H.A. and T.C. Tang, (2000). Aggregate imports and expenditure components in Malaysia: A co-integration and error correction analysis.ASEAN Econ. Bull., 17: 257-269.

Narayan, P.K. and Narayan, S. (2005) ' An empirical analysis of Fiji's Import demand function', Journal of Economic Studies, Vol. 32, No. 2, pp. 158-168.

Oyejide, T., A. (1975). Tariff Policy and Industrialisation in Nigeria. Ibadan: Ibadan University Press.

Ozo-Eson, P. I. (1984). Determinants of import demand in Nigeria: A monetary approach. Nigerian Journal of Economic and Social Studies, 26 (1), 315-327.

Pesaran, M. H., Y. Shin, and R. J. Smith. (2001). Bounds Testing Approaches to the Analysis of Level Relationships, Journal of applied econometrics, 16(3), 289-326.

Santos-Paulino, A. and Thirlwall, A.P. (2004) The Impact of Trade Liberalisation on Ex-ports, Imports and the Balance of Payment of Developing Countries. The Economic Journal , Royal Economic Society , 114, F50-F72.

Uche C. Nwogwugwu, Anne C. Maduka, Chekwube V. Madichie. Price and Income Elasticities of Import Demand in Nigeria: Evidence from the Bound Testing Procedure. International Journal of Development and Economic Sustainability Vol.3, No.4, pp.91-103, August 2015.