Imports demand behaviour and determinants: do "marshall - lerner and j – curve" effects conditions hold true in Nigeria?

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Abstract
This study examines imports demand behaviour and imports determinants in Nigeria in the period between 1970 and 2024 via a Nonlinear Autoregressive Distributed Lag (NARDL) modeling technique. This study in attempt to be distinct employed the mix approach (i.e. aggregate and disaggregate imports demand approaches) to study the behavioural influencing factors of imports demand in Nigeria, having found the determinants to be cointegrated in the long run. Thus, the study found the imports and exports demand variable determinants in terms of real income (INC) and relative prices (RP) to be cointegrated in the short and long run periods. Result obtained showed that overall import and export demands are both income and price elastic in Nigeria; thus, suggesting that J-Curve effect and Marshall-Lerner conditions are met and fully satisfied in Nigeria, and that large exchange rate swings and real income changes are both highly necessary and sacrosanct in producing an appreciable trade flows and net improvement in trade balances in Nigeria. The results of this study therefore, implied that Nigerian economies' trade balances and her net exports driven are usually perturbed by some key variable determinants in imports and exports demand namely, the real income (INC) and relative prices (RP). This study thereby, reinforces and suggests the urgent need of adequate government interventions in the Nigerian economy on issues of imports demand and trade flow drives.

Keywords: Import Demand, Export Demand, Income & Relative Prices, Marshall & Lerner Condition.

Introduction
In the past thirty years, the factors that influence imports demand have become a significant and pressing issue for many scholars, researchers, and policymakers globally. In developing countries like Nigeria, these concerns have continued to be important as they pose challenges to trade balance and trade policies. Hence, the imports and export imbalances, often caused by trade deficits, have become quite troubling for Nigeria and other developing countries since past decades. In other words, these concerns in Nigeria and other developing nations, have become persisted and remained an engaging phenomena and confronting threats challenges to

many policy makers. Consequently, import and export demand imbalances often due to trade deficit have today become quite disturbing and worrisome in the developing countries. These imbalances in the Nigeria's trade profile have recently gone beyond being a purely trade liberalisation issue that is interesting to trade policy makers only, but it is now keenly recognized as a key factor influencing the global sustainable development goals (SDGs), real output growth, trade balance, balance of payments and relevant macroeconomic policy variables and profiles (Egwaikhide, 1999; Uzunoz & Akcay, 2009; Koginam & Ekiye, 2020; Vacu & Odhiambo, 2022).

Hence, these foregoing concerns and puzzling macroeconomic issues in Nigeria trade profile present an economic paradox considering the vast human, natural, mineral and physical resources that Nigeria is blessed and endowed with. More disturbing and very perturbing is that in spite of these huge human, vast natural, physical and abundant mineral resources and the economic potentials endowments, Nigeria and many other African countries still wallow in trade imbalance and deficits, high import dependency and exports deficiencies. This perhaps, suggests that the Nigeria's trade profiles and trade imbalances are not due to the vast human, natural, mineral and scarce economic resources, but due to large fluctuations in real exchange rate, import bills changes, ongoing trade wars with top import partners, bad macroeconomic policy management and the poor trade profiles (Kognam & Ekiye, 2020; Babatunde, 2010).

Furthermore, Nigeria since independence have had several challenges and have been confronted with the iconic problems of trade imbalances and disequilibrium both stemming from a persistently growing balance of payments disequilibrium and trade deficits. Today, these confronting challenges and problems have been ascribed to the impacts of high imports dependency over real exports and the growing monocultural macroeconomic practice since the 70s. This is evident and succinctly clear, as the Nigeria's external trade in 2016 remained ₦4,721.9 billion, with exports worth ₦2,309 billion and increased imports worth of ₦2,413 billion. This denotes a trade deficit and imbalance rather than a required surplus as this deficit indicated that the country's external trade balance went negative by ₦104 billion between 2016 and 2017. Also, in the 2018, Nigeria as a giant of Africa stood at 61st position in the global imports ranking with several imported goods worth of about $36.4 billion dollars which later increased by a 30% worth value in 2019 and to about $47.3 billion dollars in the 2020 (Nigeria Bureau of Statistics, 2023).

Also, in 2020, imports remained at ₦2,193 billion while exports were as low as ₦1,070 billion, thereby showing a larger increasing trade deficit value of ₦1,123 billion in the nation's history despite the country shock hit with the global pandemic and the devastating financial crisis in last decades (CBN, 2024). These reoccurring deficits increase had been widely perceived to be hinged on huge merchandise trade deficits issues. In fact, researchers have consistently emphasized that the strong preference for foreign-made goods, combined with sluggish and weak export growth, remains a critical issue and a defining challenge confronting Nigeria and other developing economies in the African nation (Koginam & Ekiye, 2020). These catalogues of trade imbalances and balance of payments deficits have today and recently forced the most serious governments, proactive policy makers and active political leaders in the developing countries particularly Nigeria, to implement a various restrictive trade policies, regimes and strategies designed to sustain a favourable trade balance and ensure balance of payments equilibrium (Vacu & Odhiambo, 2022).

Consequently, the above observed growth patterns and trends in the Nigeria's import values have been linked to several factors as identified

by many scholars in the literature. Prominent among these is the rise in oil exports, which significantly has increased foreign exchange earnings; the heavy reliance on crude oil that led to the overlook of agriculture and other non-oil sectors following the oil booms and discoveries of the 1970s; the overvaluation of the naira during periods of exchange controls and its undervaluation (depreciation) during liberalization; as well as trade liberalization policies driven by the desire to supply capital goods and raw materials for import-substituting industries. These sets of developments thus, collectively facilitated an easier access to imports and fueled the imports rising demands in Nigeria. In other words, the expansion of domestic absorption therefore, highlighted a systemic supply inadequacy, as the aggregate demand persistently outstripped supply. Therefore, to compensate for these foregoing shortfalls and address the inelastic nature of demands in the global market, Nigeria increasingly relied on imports and its demands.

This overdependence particularly, on the non-oil imports has continually expanded the share of imports in total trade values, thus, ultimately contributing to persistent trade balance deficits (Babatunde & Egwaikhide, 2010; National Bureau of Statistics, 2024). All of these stylized facts and associated problems in Africa gave rise to the several instituted trade policy measures and regimes such as the new ECOWAS Common External Tariff (CET), the imports duty and tax exemptions and concessions, supplementary protection tax (SPT), import prohibitions and restrictions in protecting domestic industries and reducing the balance-of-payments deficits; and on moral or safety grounds, Anti-dumping to protect the country from being a dumping ground, countervailing, and even safeguard measures. However, others also include the export support and promotion strategies, the export processing zones (EPZs) and export finance, insurance, and guarantees among others in Nigeria and other developing economies.

However, despite these different and several trade policies, recent policy measures and strategic reforms calls by policy makers and successive governments, the Nigeria's imports demand still continued to increase rapidly and sporadically over the exports supplies. This is evident, as Nigeria's imports have been persistently dominated by the manufactured products with a share value of over 60% where most available agricultural imports were mostly food, thus accounting for about 94% of total agricultural imports demand and a 6% of total agricultural exports demand even with the country's vast labour (human) and abundant natural resources possessions both in farming cultivation, cropping and food productions (CBN, 2024). This constitutes a paradox, a concerned puzzle and serious dilemma to be unravelled following the comparative advantages and factor endowment propositions and theories.

It is therefore, based on these above generated issues, paradox concerns, puzzles and dilemma surrounding the imports and exports demand that this research work seeks to discuss the imports demand function and its overall influencing factors, by empirically testing the credibility and robustness of Marshall-Lerner and the J-Curve effects phenomena possibility in Nigeria. This study thus, remains exceptionally different as it broadens the scope of knowledge with adequate focus on the aggregate and disaggregate imports mix channels. This will be achieved via the Nonlinear ARDL estimation technique as it addresses the key issues of endogeneity, heteroskedasticity and autocorrelations associated with time series data.

2. Literature Review

Several general models and theories of trade have been widely used in the literature in examining the import and export demands and their determinants across countries' trade flows globally. These are the traditional Classical, Keynesian and Neo-classical theories of import and export demands. The traditional Classical and Keynesian theories comprise mainly the perfect substitutes, imperfect substitutes and

mercantilism theories (Goldstein and Khan, 1985) whose emphasises are on determining factors like prices, incomes and exchange rates as key determining variables of the imports demand behaviour. The Neo-classical theory on the other hand, is connected with several theories like the comparative advantage by Ricardo, the factor endowment by Heckscher and Ohlin, and the gravity by Isard (Koginam and Ekiye, 2020).

Therefore, empirical research on developed economies has yielded mixed evidence on the determinants of trade demand. Ho (2004), analyzing Macao with quarterly data from 1970-1986 through cointegration and error correction models, found that investment, exports, and relative prices significantly influenced import demand, consistent with theoretical expectations. By contrast however, empirical studies like Zhou and Dube (2011) via bounds test, observed contrary results to theories, thereby, reporting a direct link between relative prices and imports demand function, strong income responsiveness, but weak sensitivity to price changes in findings. Fukumoto (2012), applying the bounds test to Chinese data from 1988-2005, found that GDP, investment, disposable income, and consumption significantly shaped imports demand, with additional dummy variables strengthening the role of prices and income. Broader evidence from panel studies also supports these dynamics. For example, Senhadji (1998), using non-stationary time series techniques on 77 countries (including oil exporters), identified GDP minus exports as the key activity variable. While most coefficients aligned with theoretical expectations, income elasticity was notably small for oil-exporting economies, falling below unity and even below 0.1 for Norway, reflecting their reliance on export revenues as a major income source.

Bahmani-Oskooee and Niroomand (1998), analyzed about 30 countries in periods between 1960 and 1992 using the Johansen–Juselius cointegration technique, and the study found long-run relationships on imports demand determinants, with both prices and incomes elasticities generally high. Unlike this study, Huseyin (2006) examined Turkey's import demand using quarterly data (1994-2003) within the ARDL and ECM framework, confirming both long- and short-run relationships among imports, relative prices, and real GNP. These findings align with earlier results for developed economies, though Hemphill (1974), applying a balance-of-payments perspective to eight developed countries, highlighted foreign exchange earnings as the dominant factor shaping aggregate imports demand. Abbot and Seddighi (1996) found that expenditure components and relative import prices significantly influenced imports demand in the UK in the periods between 1972 and 1990. However, Chinn (2003), analyzing U.S. data from 1975-2001 with Johansen cointegration, reported no significant role for exchange rates or relative income on imports demand. In Greece, Alexiou (2010) showed that government expenditure positively affected imports demand using the bounds testing technique on 1970-2007 data. More broadly, Vacu and Odhiambo (2022) highlighted that imports demand behaviour and determinants vary across countries and periods, in other words, based on whether income is treated in aggregate or disaggregated form, and the underscoring differences between developed and developing economies.

Empirical researches on imports demand and determinants remain limited in Nigeria. One of these earliest studies, Olayide (1968), analyzed selected import commodities between 1948 and 1964 and found that terms of trade, real income (GDP), and trade restrictions significantly influenced imports. Ajayi (1975) extended this inquiry and identified real income, relative prices, and foreign exchange as main determining variables of imports demand and behaviour in the 1960s and 1970s. Building on these, Ozo-Eson (1984) adopted a monetarist model that incorporated excess money supply, revealing that relative prices and money supply strongly shaped import demand, while real income proved statistically insignificant. Similarly, Egwaikhide (1999), demonstrated that

foreign exchange availability, relative prices, and real output were key drivers of import demand growth in periods between 1953 and 1989 in Nigeria, with raw material imports particularly, responsive to foreign exchange and trade liberalization. However, Babatunde and Egwaikhide (2010), applying a bound testing approach on 1980-2006 data, affirmed a long-run relationship existence among imports, incomes, and relative prices, but reported price elasticity below unity, thus, implying that the Marshall-Lerner condition does not hold for Nigeria during these periods.

More recently, Awomuse and Fatokasi (2011), through an error correction model, established that while real GDP predominantly influenced imports in the short run, a stable long-run relationship also existed among the variables. Overall, the evidence underscores the critical roles of income, relative prices, monetary factors, and foreign exchange in shaping Nigeria's import demand, with varying outcomes across periods and methodologies. Nteegah and Mansi (2016), using OLS and ECM techniques for the period 1980-2014, affirmed real income, exchange rate, domestic price levels, external debt, openness, and investment as potential determinants of imports in Nigeria. Their results revealed that real income, price changes, and exchange rate exerted significant negative effects on imports, while openness, capital formation, and external debt positively influenced imports growth. Similarly, Abdullahi and Suleiman (2018), examining 1980-2017, found real GDP and openness to be key determinants, while exchange rate and foreign reserves proved insignificant, a result that contrasts with earlier studies.
For instance, Sani (2014), focusing on 2007-2011, reported that external reserves, consumer prices, income, and exchange rates significantly shaped imports demand. Koginam and Ekiye (2020), employing ARDL and ECM approaches over 1981-2017, further confirmed a long-run cointegration among imports, real GDP, CPI, and nominal exchange rate, with real GDP exerting the strongest influence. Their findings revealed that import demand was more sensitive to changes in income relative to the consumer price levels, while an increase in the domestic currency tended to increase imports demand and behaviour. Collectively, the studies emphasized that although income remains the most consistent driver of imports demand determinants, but the role of relative prices, exchange rates, and external factors remained varied across time and methodologies.

In contrast to many earlier studies, Ogbonna (2016) analyzed Nigeria's aggregate import demand using a VAR framework, expanding the set of explanatory variables by including disposable income and the world price index alongside the conventional indicators of exchange rate, consumer prices, and real GDP. His findings revealed that disposable income, the world price index, and real exchange rate were significant drivers of import demand in the long run, though they lacked significance in the short run. Beyond Nigeria, several studies in other developing African economies have also examined the determinants of import demand. For instance, Harvey & Sedegah (2011) investigated Ghana's imports structure, while Case and Fair (2010) studied Côte d'Ivoire using cointegration and bounds testing. Both studies highlighted domestic income, foreign reserves, openness, import prices, and consumption expenditures as significant determiner of imports demand in both countries. Similarly, Aljebrin and Ibrahim (2012), analyzing GCC countries from 1994 to 2008 through a panel SUR model, found imports to be positively influenced by real income, private consumption, international reserves, and gross capital formation, while relative import prices and government spending exerted significant negative effects. More recently, Ali, Yimer, and Dessie (2024) applied a nonlinear ARDL model to Ethiopia (1985-2021) under foreign exchange constraints and found that foreign reserves, prices, incomes, exchange rate volatility, money supply, and policy dummies significantly shaped imports demand in long run. Importantly, with both price and

income elasticities confirming the theoretical expectations and were statistically significant.

Vacu and Odhiambo (2022) analyzed Tanzania's import demand between 1985 and 2015 using the ARDL bounds testing framework on both aggregate and disaggregate models. Their results indicated that imports demand was positive and was significantly influenced by real investment and exports, while the trade policy exerted a significant and indirect influence on imports demand and determinants in Tanzania. It is thus, worth noted that despite the volume of researches and limited available studies on imports demand behaviour determinants in the Nigerian context, some few critical gaps and arguments still exist and persist in both findings and results of studies in the advanced literature. First, while very much of the foregoing researches and available studies had focused largely on the country-specific study analyses, it is also very insightful that these several studies perhaps may not have adequately captured the unique mix aggregated and disaggregated imports demands as most previous and current available studies had focused solely on the aggregate imports demand channel viz-a-viz their behavioural determinants.

This therefore implies that a very limited attention has been given to understanding the distinct aggregated and disaggregated imports demand determinants channels in developing countries. This perhaps is because, while several research studies had focused solely on the aggregate import demand channel, few had considered mix channels involving the aggregate and disaggregate imports channels both in Nigeria and most developing countries. Thus, even while a previous study by Vacu & Odhiambo (2022) had employed the mix approach (aggregate and disaggregate imports) in Tanzania between 1985 and 2015, this study however, is limited in scope and do not consider the export and import demand behavioural determinants. This study is larger in scope as it concentrates in elongated periods between 1970 and 2024 in Nigeria. This study outside being recent and larger in scope, employed a more sophisticated and robust estimation technique of the Nonlinear ARDL. This approach is simple, robust and sophisticated as it addresses the issues of endogeneity, variable bias, heteroskedasticity and serial correlations problems often connected with time series and panel studies.

Methodology

The theoretical framework and foundation for this study remains the imperfect substitutes theory of Goldstein and Khan (1985). This framework is widely regarded as the standard in empirical trade literature for specifying and estimating imports demand functions and determinants across developed and developing economies. The central premise is on fact that both the imports and exports are imperfect substitutes for domestic and foreign goods. If perfect substitution existed, a country would engage exclusively in either exporting and/or importing. Moreover, variations in product prices across countries (after currency conversion) and between domestic and export prices of the same product within a country prevent imports and exports from being perfect substitutes. Accordingly, these imperfect substitutes model, which captures country *Y*'s imports from and exports to the rest of the world (*), is formally expressed as follows:

$I_i^d = f(Y_t, PI_t, P_t)$ Where; $f_1, f_3, f_2 < 0$ …….……. (1).

$X_i^d = g(Y_{et}^*, PX_t, P_e^*)$; Such that: $g_1, g_3 > 0$ & $g_2 < 0$ ……..……..……..… (2).

$I_i^s = h[PI^*(1+S^*), P^*]$, $h_1 > 0$, $h_2 < 0$ ……..……..……..…… (3).

$X_i^s = j[PX_i(1+S_i), P_i]$ $j_i > 0$, $j_2 < 0$ ……,……..…….. (4).

$PI_1 = PX^*(1+T_i)e$ ……..……..……..……..…… (5).

$PI^* = PX_i(1+T^*)/e$ ……..…… (6).

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$I_i^d = I_i^s e,$ …… (7).

$X_i^d = X_i^s$ …… (8).

Where equations (1) and (3) denote the import and export demand equations respectively, while equations (2) and (4) are the export demand and supply equations. Others include:

I_i^d = Imports demand quantity in country "i" from the rest of the world.

X_i^d = Exports demand quantity by the rest of the world from country "i".

I_i^s = Imports quantity supplied to country "i" by the rest of the world.

X_i^s = Exports quantity supplied from country "i" to the rest of the world.

PI_i and PI^* = Domestic currency prices paid by importers at home and abroad.

PX_i and PX^* = Domestic currency prices received by exporters at home and abroad.

Y, Y^* = Nominal income levels at home and abroad.

P_i, P^* = Price of (all) domestically produced goods at home and abroad.

T_t, T^* = Proportional tariffs applied to import and exports at home and abroad.

S_i, S^* = Imports and exports subsidies both at home and abroad.

e = Real exchange rate expressed in units of country i's currency per unit of the rest-of-the world's currency.

Therefore, relying on assumptions of both Neoclassical and Imperfect substitutes framework, we adopted the most commonly used specification of the aggregate import demand function, which consists mainly incomes (Y) and relative prices (RP) as the proxies for imports demand determinants. Thus, formulating the long run imports demand functions for Nigeria in econometric form, we derived equation (9):

$M^d = f(Y, RP \ \& \ e)$ …… (9)

Where; M^d = Real quantity of aggregate imports demanded.

Y = Income (INC) proxied by real GDP.

RP = Ratio of the aggregate import price (P_m) and the price index of the domestically produced goods (P_d).

e = Error term which captures other determinants not mentioned.

Therefore, the prices in relative terms in equation (9) above yields two key implications. First, it affirms that domestic and imported goods are imperfect substitutes. Second, it minimizes potential collinearity among price variables during estimation. This aggregate import price also incorporates both tariff and non-tariff measures. Traditionally, import demand functions are estimated using linear or log-linear specifications (Khan, 1974). While economic theory provides a priori guidance for functional form selection, the ultimate choice remains empirical. In this study, the semi log-linear specification is adopted in deriving the equation (10), given that the prices are expressed as ratio of imports and the domestic price indices. Hence, taking a natural log of the relative price index would perhaps, lead to coefficients bias both in relative prices and real income; and the inefficacies of empirical available studies to acquire long run cointegration between the imports demand and imports determinants. These aggregate imports demand and determining factors is explicitly presented as follows in equation (10):

$lnM^d = \alpha_0 + \alpha_1 lnY_t + \alpha_2 RP + \varepsilon_t$ …… (10).

Where; ln = Natural logarithm, and; $\in_t$= Error term (assumed to be randomly and normally distributed and whose objective is to proxy other important determinants not included in this model).

Thus, the constant term ($\propto_0$) is included since there will always be some imports even if all

other determiners are zero. The estimated coefficients ($\propto_1$) and ($\propto_2$) are the estimated income elasticity and price coefficients parameters of the imports demand function respectively. Theoretically and based on the economic theory, the usual apriori procedure is to assume that ($\propto_1$) > 0 (i.e. positive), thus implying that a direct association is hypothesized and expected between real income (Y) and imports demanded (M^d), while ($\propto_2$) < 0 (i.e. negative), indicates an indirect association is expected between relative prices (RP) and imports demand (M^d).

The above equation (10) became modified and was further estimated for the imports demand for consumer, intermediate, and capital goods for both the aggregated and disaggregated analysis of the import demand function. These techniques via disaggregated analysis and bounds test give opportunity to control the potential biases occasioned by the endogeneity, collinearity and heteroskedasticity in some of the explanatory variables noted in some of the past studies. Thus, given the obvious strengths and robustness associated with the NARDL bounds test modelling and the disaggregated analysis, these two approaches are therefore considered most appropriate and fitting to be adopted with the general approach of aggregated analysis in this paper. Thus, re-writing the Pesaran's ARDL, ECM and NARDL model in their dynamic form in (10) gives the equations (11a) and (11b) respectively. Thus, we derived both equations (11a) and (11b) for the linear and nonlinear ARDL and unrestricted short run ECM as follows:

$$\Delta M_t^d = \beta_0 + \sum_{i=0}^{n} \beta_{1i}\, \Delta lnY_{t-i} + \sum_{i=0}^{n} \beta_{2i}\, \Delta RP_{t-i} + \sum_{i=0}^{n} \beta_{3i}\, \Delta lnM^d{}_{t-i} + \gamma_1 lnY_{t-i} + \gamma_2 lnRP_{t-i} + \gamma_3 lnM^d{}_{t-i} + \varepsilon_t \quad \text{.....11a).}$$

$$\Delta M_t^d = \beta_0 + \beta_{1i}\Delta lnM_{t-i}^d + \beta_{2i}^-\Delta lnY_{t-i}^- + \beta_{3i}^+\Delta lnY_{t-i}^+ + \beta_{4i}^- ln\Delta RP_{t-i}^- + \beta_{5i}^+ ln\Delta RP_{t-i}^+ + \sum_{i=0}^{p}\gamma_i^-\Delta lnY_{t-i}^- + \sum_{i=0}^{p}\gamma_i^+\Delta lnY_{t-i}^+ + \sum_{i=0}^{p}\gamma_i^-\Delta lnRP_{t-i}^- + \sum_{i=0}^{p}\gamma_i^+\Delta lnRP_{t-i}^+ + \varepsilon_t \quad \text{.....(11b).}$$

Where M_t^d = stands for the natural logarithm of the regressand (import demand) in a country at time t and;
Δ = First difference operator;
ΔM_{t-1}^d= is the lagged or first difference operator of the regressand;
Y_t = Log of incomes proxied by RGDP;
RP_t = denotes prices proxied by real exchange rate.
$\propto_0$= Constant of the model and
($\propto_1 - \propto_3$) = Coefficients of the long run estimates and
$\beta_1 - \beta_5$ = Coefficients of the short run dynamics and estimates.
This study therefore, employed the use of secondary data on key variables like nominal exchange rate, RGDP, aggregate non-oil imports, consumer, intermediate, and capital goods imports and consumer price index. These key variables were obtained from the statistical bulletin of Central Bank and the World Development Indicator thus, covering the scope and periods between 1970 and 2024.

5. Results and Discussion of Findings

5.1 Descriptive Statistics and Correlation Coefficient Analysis

Tables 1 and 2 present the average mean values, the median and the standard deviations values of the key regression variables employed in the study, serving as preliminary tests to justify model selection. As shown in Table 1, the logarithmic mean of MT records the highest average value (2.52) among the disaggregated import components, indicating that Nigeria's import structure is dominated by machinery and transport equipment. This is followed by manufactured goods with average values of 2.11. Thus, while the logged values of AV, BT and MF are less than unity on average, CH, CM and FD have high mean values in excess of 1 in the disaggregated level. Based on the independent

variables for the aggregate, INC has the highest mean values with average value of (13.21), followed by TI (12.22), while ER constitutes the lowest (2.81) but it is above unity. All the variables seem to have median values not much different from the average figures

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Table 1: Descriptive Statistics of the Variables

	AV	BT	CH	CM	ER	FD	RGDP	MF	MG	MT	TI
Mean	0.86	0.77	1.89	1.32	2.81	1.70	13.21	0.91	2.11	2.52	12.22
Median	1.28	1.55	1.20	1.28	2.03	2.11	11.59	1.09	2.09	2.21	10.73
Maximum	3.81	3.92	3.71	2.87	2.93	3.96	14.63	5.41	4.83	3.98	13.97
Minimum	1.25	1.21	1.91	1.23	1.71	1.38	11.81	1.45	1.33	1.06	9.91
Std. Dev.	1.01	0.53	0.33	0.73	0.17	0.14	0.99	0.13	1.09	0.23	0.89
Skewness	0.16	-0.15	-0.29	-0.58	0.90	0.52	0.33	0.53	-0.41	-0.20	-0.42
Kurtosis	2.02	1.99	1.71	1.91	2.32	1.96	1.89	1.89	2.61	1.79	1.52
Jarque-Bera	1.57	2.03	3.02	3.21	3.11	3.01	3.19	1.51	1.21	2.18	2.14
Probability	0.06	0.04	0.07	0.10	0.08	0.09	0.06	0.05	0.03	0.13	0.09
Sum	18.04	13.62	25.12	23.81	48.28	39.08	54.98	10.80	35.02	36.92	16.0 1
Sum Sq. Dev.	58.09	36.08	32.49	15.11	15.68	7.17	18.55	24.42	13.13	17.77	44.08
Observations	51	51	51	51	51	51	51	51	51	51	51

Source: Author's Computation.

Table 1 further indicates that the series display noticeable dispersion around their respective mean values, as reflected in the reported standard deviations. According to the conventional rule, variable variation from the mean should be equal to or closer to 0, suggesting minimal variation from the mean over time and, hence, lower volatility. In this case, the computed standard deviations are not significantly different from zero, thus indicating that the variables exhibit relatively stable behaviour over the study period and conform to this benchmark. It is almost natural to conclude that variables with least share in Nigeria's total imports (AV, BT, CH, CM, TI and MF) are those with largest deviations from their averages. As also shown in table 1 while AV, BT, CH, CM, FD, TI and MF are all free variables as they take positive and negative values, others are strictly positive variables.

The skewness on another hand, gives the information on degree of asymmetry in distribution of the series and data around its mean. A smaller deviation from the mean corresponds to a standard deviation closer to zero. Results in Table 1 indicate that, except for AV, ER, FD, RGDP, and MF, all other variables exhibited negative skewness, suggesting distributions with longer tails to the left. Similarly, kurtosis, which reflects the peakedness or flatness in series, showed that all variables have values below the benchmark of 3, thus, implying platykurtic distributions and flatter than the normal. Finally, the Jarque-Bera test results confirm that the null hypothesis of normality cannot be rejected, establishing that key variables

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are normally distributed at 1%, 5%, and 10% significance levels.

Table 2 displays the results of the degree of association among the chosen variables in the study. This analysis is crucial for detecting potential multicollinearity issues. The results indicate weak correlations between ER, RGDP, TI, and the endogenous variables, with values ranging from –0.26 to –0.27 for ER, 0.25 to 0.38 for RGDP, and 0.27 to 0.39 for TI. Similarly, correlations among the endogenous variables themselves remain relatively low, with coefficients between 25% and 49%. These values suggest that multicollinearity is not a major concern, as the observed relationships are moderate. Thus, data series can be included in same model without producing a spurious, biased, or inconsistent regression estimate.

Table 2: Correlation Coefficients between the Variables

	AV	BT	CH	CM	FD	MF	MG	MT	TI	ER	RGDP
AV	1										
BT	0.29	1									
CH	0.27	0.44	1								
CM	0.33	0.41	0.49	1							
FD	0.39	0.34	0.27	0.47	1						
MF	0.21	0.48	0.31	0.35	0.34	1					
MG	0.25	0.33	0.39	0.38	0.27	0.25	1				
MT	0.31	0.41	0.28	0.17	0.18	0.26	0.28	1			
TI	0.44	0.33	0.29	0.38	0.28	0.27	0.29	0.39	1		
ER	-0.26	-0.42	-0.27	-0.41	-0.36	-0.32	-0.39	-0.44	-0.41	1	
RGDP	0.25	0.36	0.29	0.29	0.28	0.29	0.25	0.38	0.27	0.25	1

Source: Author's Computation.

***Key Notes: **FD =** Food and Live Animals; **BT** = Beverage and Tobacco; **CM** = Crude Materials; **MF** = Mineral Fuels; **AV** = Animals and Vegetable Oils; **CH** = Chemicals; **MG** = Manufactured Goods; **MT** = Machinery and Transport Equipment; **TI** = Total Imports; **RGDP** = Real Income and **ER** = Real Exchange Rate.

Stationarity Tests

To verify whether the series exhibit mean reversions, both the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) stationarity tests were employed under both drift and trend specifications. These findings revealed that most variables (TI and ER) were non-stationary at levels but became stationary at first differences, I(1), while RGDP remained stationary at level, i.e. I(0). Thus, having established that all variables are mixed and integrated of different orders I(0) and I(1), the Non-linear ARDL technique and bounds test became most appropriate technique to confirm a long run co-existence among the variables employed in the study.

Table3: Results of ADF and PP Stationary Test

Variables	Constant		Constant and Linear Trend		Order of Integration
	Levels	First Diff.	Levels	First Diff.	Decision

TI	**ADF**	-0.7126	-7.0880	-1.1622	-7.0314	I(1)
	PP	-0.5013	-7.0511	-2.3831	-7.0159	I(1)
FD	**ADF**	-1.2106	-6.1160	-3.1469	-6.1291	I(1)
	PP	-1.0438	-6.1353	-2.3042	-6.1329	I(1)
BT	**ADF**	-0.1221	-6.4631	-1.1033	-6.3628	I(1)
	PP	-0.3070	-7.3301	-2.0033	-7.2652	I(1)
CM	**ADF**	-1.2321	-6.2601	-2.0877	-6.6141	I(1)
	PP	-1.2610	-8.5218	-1.0872	-9.4695	I(1)
MF	**ADF**	0.2401	-6.0088	-1.7873	-6.0315	I(1)
	PP	0.1129	-9.0221	-1.2065	-11.0603	I(1)
AV	**ADF**	-0.1901	-8.0746	-2.0392	-8.1108	I(1)
	PP	0.0116	-7.9901	-3.0121	-8.1043	I(1)
CH	**ADF**	-1.2128	-6.2575	-1.3610	-6.5938	I(1)
	PP	-1.2102	-6.2349	-0.5300	-6.6233	I(1)
MG	**ADF**	-2.3010	-7.2493	-0.3472	-4.6078	I(1)
	PP	-1.0126	-7.2349	-1.1743	-7.4105	I(1)
MT	**ADF**	-0.5214	-6.7803	-2.1150	-6.7304	I(1)
	PP	-0.8144	-6.7637	-2.0806	-6.7488	I(1)
ER	**ADF**	-2.1102	-5.4393	-2.1778	-4.4469	I(1)
	PP	-2.2521	-6.3466	-2.1778	-5.2710	I(1)
RGDP	**ADF**	-5.8132	-6.9893	-5.9503	-7.9206	I(0)
	PP	-5.9924	-7.0058	-5.9826	-7.9959	I(0)

Source: Author's Computation.

5.3 ARDL Bounds Test

Table 4 presents the Non-linear ARDL (bounds test) of cointegration. The estimated f-statistic value (15.0712) exceeded the upper bound at 1% and 5% critical and significance levels respectively, thus, confirming a long-run association and existence of cointegration among key variables of imports, exchange rates and incomes. Based on this result, we reject the null hypothesis that assumes no cointegration at 1%, and conclude that a long run relationship and cointegration exists among imports and imports determinants. This evidence, therefore, justified the choice of an error correction mechanism (ECM) and the Non-linear Autoregressive Distributed Lag technique to proxy the short and long run imports dynamics in this study.

Table 4: Bounds Test Results of Cointegration

Model	**Computed F-Statistic**	
Imports (LTI)	15.0712	
Bounds Level	**I (0) Lower Bounds**	**I (1) Upper Bounds**
1% critical Value	5.15	4.14
5% critical Value	3.79	4.85
10% critical Value	3.17	2.91

Source: Author's Computation: **Notes:** computed Bounds Test is the ARDL co-integration test and asymptotic critical value bounds are automatically generated from E-views.

5.4 Parsimonious asymmetry Results of Aggregate Imports and Imports determinants in Nigeria

The long run asymmetric elasticities showed that positive and negative income shocks (proxied by real GDP growth) exist namely; 21.6817 and –18.2720, while those of relative prices (proxied

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by the real exchange rate) are 11.0172 and –17.8602, respectively. All estimates carry the expected signs and are statistically significant at 1%. These findings align with economic theory and previous studies, thus, confirming that import and export demand is income-elastic but price-inelastic. Consequently, the Marshall–Lerner condition highlights the long-run effect of exchange rate changes on trade balance, whereas the J-curve effect explains the short-run dynamics, showing an initial deterioration before eventual improvement.

Also, in long run, a one percent rise in positive relative prices (RP^+) is associated with an 11.02% increase in Nigeria's import and export demand, whereas a negative shock to relative prices (RP)– leads to a 17.86% decline in demand. This suggests that when exchange rate movements generate adverse shocks such as domestic currency depreciation the result is reduced import demand and an eventual improvement in the trade balance. Put differently, upward shifts in relative prices through exchange rate depreciation exert a strong and favorable influence on trade flows, while downward movements cause significant reductions in demand. These findings corroborate theoretical expectations and empirical works of (Ho, 2004; Hay & Mashkoor, 2010; Huseyin, 2006; Rehman, 2007; Olayide, 1968; Ajayi, 1975; Egwaikhide, 1999; Egwaikhide & Babatunde, 2010; Nteegah & Mansi, 2016; Awomuse & Fatokasi, 2011; Koginam & Ekiye, 2020; Harvey & Sedegah, 2011; Case & Fair, 2010; Ivohasina & Hamori, 2005).

Thus, with respect to income variable proxied by a real GDP, a one percent increase in positive shocks to real income leads to about 21.68% increase in her imports and exports demand. (net improvement in her trade balance). This implies that a rising income has a significant and positive long- term effect on imports and exports demand; and this occurs as domestic demand imports is lesser than the domestic production for exports. This also suggests that a positive shock in real incomes is positive and significant at 1%. This result also corroborates the earlier findings and studies by (Ho, 2004; Hay & Mashkoor, 2010; Huseyin, 2006; Rehman, 2007; Egwaikhide & Babatunde, 2010; Awomuse & Fatokasi, 2011; Koginam & Ekiye, 2020; Harvey & Sedegah, 2011, Case & Fair, 2010; Ivohasina and Hamori, 2005), and the economic theory, but negates the previous findings and studies by (Ozo-Eson, 1985 and Nteegah & Mansi, 2016) which found real income and import relationship to be negative.

Also, a one percent increase in the negative shocks to real income (RGDP) leads to about 18.27% decrease in imports and exports demand in the long run. This indicates that a reduction in real income yields a significant decline in the imports and exports demands i.e. the net trade balance in Nigeria. The findings of this study indicate that both real income and relative prices are determinants of imports and exports demand (trade balance improvements or decline) in Nigeria both in long run and at aggregate level. Hence, the values of import demand with respect to real income (RGDP) and relative prices (EXR) variables are at (21.68, -18.27) for real income, and (11.02, -17.86) for relative prices (exchange rate) respectively, and this ascertains the claim that Marshall-Lerner conditions hold true and is satisfied (met) for Nigeria's imports and exports i.e. her trade balance in the long run since the price elasticity of imports and exports demand, and the absolute sum of both export and import demand elasticities are greater than unity i.e. one as demand elasticities which are; $e = 11.02 > 1$ and $e = 17.86 > 1$ are greater than one respectively. This negates and do not conform to earlier findings by Tang (2002) and Egwaikhide and Babatunde (2010), but corroborates and affirms the previous findings and studies by Gafar (1988), Sinha (1997), Sinha & Sinha (2000), Awomuse & Fatokasi (2011) and Koginam & Ekiye (2020).

Table 5: Estimated Long Run NARDL Model and Aggregate (Total) Import Demand Determinants

Variable	Coefficient	Standard Error	T-Statistic & [P-Value]
C	21.4328***	87.0070	0.2463 [0.0000]
INC_t^+	21.6817***	0.47493	45.652 [0.0000]
INC_t^-	-18.2720***	3.3091	-5.5217 [0.0000]
RP_t^+	11.0172***	3.4089	3.2319 [0.0025]
RP_t^-	-17.8602***	3.5003	-5.1025 [0.0000]

Source: Author's Computation. **Dependent Variable** is **LTI** (log of Total Imports). **Note: ***** denotes statistical significance at 1% level; ****** denotes 5% level and ***** denotes a 10% level.

Table 6: Estimated Short Run NARDL Model for Aggregate Imports Determinants in Nigeria

Variable	Coefficient	Standard Error	T-ratio (P-Value)
C	2.1433	8.7007	0.2463 [0.8067]
ΔTI_t^+ (-1)	3.2049	0.0996	32.167 [0.0000] ***
ΔTI_t^- (-1)	4.2291	3.5734	1.1835 [0.2438]
ΔINC_t^+	21.6817	0.4749	45.652 [0.0000] ***
ΔINC_t^-	5.0212	3.3779	1.4865 [0.1452]
ΔRP_t^+	11.0172	3.4089	3.2319 [0.0025] ***
ΔRP_t^-	-6.8430	1.5967	-4.2857 [0.0001] ***
ECM_t (-1)	-0.5394	0.2679	-2.1809 [0.0448] **

Source: Author's Computation. **Dependent Variable** is **LTI** (log of Total Imports).
Note: *** denotes statistical significance at 1% level, ****** at 5% level, and ***** at 10% level.

Table 6 presents the short-run asymmetry model estimates for relative price and income elasticities, highlighting the immediate impacts of the explanatory variables on real imports as well as capturing the short-run dynamics of J-curve effect. The findings conform with what was obtained in the long run. In particular, in the short run, a 1% negative shock to price increase through the exchange rate appreciation will reduce the import demand by 6.84%, while a 1% increase in negative shock to real income through the increase in real GDP (i.e. the national output) will increase real import by 5.02% but not statistically significant in the short run. Also, a one percent positive shock increase to real income variable induces increase in the real imports and exports demand by 21.68% and is positively significant in the short run. This result corroborates the earlier findings by (Ho, 2004; Hay & Mashkoor, 2010; Huseyin, 2006; Rehman, 2007; Egwaikhide & Babatunde, 2010; Awomuse & Fatokasi, 2011; Koginam & Ekiye, 2020; Harvey & Sedegah, 2011; Case & Fair, 2010; Ivohasina & Hamori, 2005).

Hence, with respect to the relative price variables, it implies that a positive shock increase to the relative price (EXR) swings brings about 11.02% rise in real imports temporarily in the short run, while a negative shock increase produces about 6.84% decline in real imports and exports demand in the short run as shown in Table 6. These price relation values (11.02 and 6.84 > 1) proxied by the by the exchange rate changes confirms the claim of the J-curve effect in Nigeria, suggesting that a naira devaluation or depreciation, would initially worsens her trade balance at the downward slope of the "J"- Curve before its expected net improvements in the long

run at the upward slope of the "J"- Curve. This implies that the J-curve effect condition holds true for Nigeria in the short run, since the price elasticity of quantity demand for imports and exports (in absolute values) is greater than unity in the short run, thereby indicating a short-term dynamic of the exchange rate changes, swings and impacts (naira devaluation and depreciation) on net trade balance and payments increase in Nigeria.

This perhaps might possibly be responsible for the past and recent worsening net trade balance and improvements in Nigeria both in SAP and post SAP era. Hence, a reason for a recent trade deficit and current trade imbalance both in exports and imports demand as evidently shown in past and present years. Little wonder the government continuously seeks devaluation of naira policy and frequently keeps and engages in borrowing from external sources even while her trade balance improvement falls. This also confirmed the earlier findings in studies by (Gafar, 1988, Sinha, 1997; Sinha & Sinha, 2000) and contradicts the findings in the studies by (Tang, 2002; Egwaikhide and Babatunde, 2010). Furthermore, the total imports are also autoregressive and statistically significant; thus, suggesting that an improvement to previous year's positive imports shock increase is likely to reduce the current year's import demand levels by 2.14%. It was also observed that the immediate past values of import levels and its shock increase had positive elasticity with itself. Specifically, when one-year lagged import levels are up by 1% each in positive and negative shock, the total imports are up and increased by 3.20% (significant only at 1%) and 4.23% respectively but not significant.

It therefore, follows that it takes at least three years for a rise in real GDP to register and translate direct effect on total imports in the short run. The error correction term, ECM (-1) is negative and statistically significant, confirming that the model adjusts to long term equilibrium whenever there is a short-term disequilibrium. This outcome supports the cointegration test, affirming the presence of a long-run relationship among variables of study. Put differently, it demonstrates the stability of the model and shows that a disequilibrium in real imports is corrected each year. The error correction (ECM) coefficient -0.5394 is statistically significant at 1%, implying that approximately 53.9% of the previous year's deviation from long-run equilibrium is adjusted and corrected within one year. Thus, short-term fluctuations in imports are corrected relatively quickly, with over half of the imbalance restored annually. This suggests that import demand in Nigeria adjusts relatively quickly to shocks in the determinant factors of imports under study. This finding demonstrates that any disruptions in real imports caused by changes in determinants and key variables like relative price and income are corrected over time, ensuring long-term export led growth than import.

Parsimonious asymmetry Results of Disaggregate Imports and Imports Determinants in Nigeria

Table 7 revealed the impact analysis of explanatory variables, INC and RP on each of the disaggregated components of imports. Statistical evidence in the long run showed that on the FD, a one percent increase in the positive shocks to real income (INC) brings about 1.63% increase in the FD component, while a one percent increase in positive shocks to relative prices (RP) brings about 0.62% increase in FD as well. Also, on BT, a one percent increase in positive shocks to real income (INC) brings about 1.51% rise in the BT and a one percent rise in the positive shocks to exchange rate (ER) brings about 0.52% decline in BT but not significant; on CM, a one percent positive increase in INC brings about 1.4% fall in CM and one percent increase in relative price (RP) brings about 1.2% rise in CM though not significant; on MF, 1% increase in INC brings about 1.6% increase in MF and 1% increase in RP brings about 0.6% increase in MF; on AV, a one percent positive increase in INC brings about 1.4% rise in AV, and a 1% rise in RP brings about 0.8% rise in AV; on CH, a one

percent increase in INC brings about 1.3% rise in CH and one percent rise in ER brings about 0.5 rise in CH; on the MG, a one percent increase in INC brings about 0.6% rise in MG and one percent rise in RP brings about 2% decline in MG; on MT, a one percent increase in INC brings about one increase in MT, and a one percent increase in RP brings about 1% decline in MT respectively.

Similarly, it shows that all INC coefficients on each of the import components are significant at 1% except MG and BT at 10%, and all RP coefficients on each of the import components were significant at 1% level except for BT, CM, AV, CM, MF and MT became significant at 5%. In summary, this shows that INC (RGDP) and RP (EXR) both exerted a mixed impact (positive and negative) and relationship with all the imports components with FD, BT, CM, MF, AV, CH, MG and MT in long run. This suggests that the different components of imports in long run will further increase as income rises thus, increasing the aggregate imports demand in the economy.

In same vein, the inverse relationship between income and some of the components of imports, implies that BT, FD, CM and MF will decrease when income increases; but increases when income falls. However, the positive coefficient sign of incomes (INC) on imports demand model shows that the effect of the other components of imports outweighs that of MG. Put differently, though income inversely affects BT, FD, CM and MF, it also has meagre impact and effect on the aggregate import demand of the economy in the long run. Similarly, the direct relationship between MF, AV, CH, FD, MG, MT and CM indicates that import demand increases as the domestic currency depreciates showing that the economy is highly dependent on these particular components of imports. Conversely, the indirect relationship existing between exchange rate and disaggregate imports components (MF and MT) indicates that a rise in the value of the domestic currency stimulates disaggregate imports demand components in Nigeria.

Table7: Long Run NARDL Model estimates of disaggregated Imports Determinants in Nigeria

Variable	LFD	LBT	LCM	LMF	LAV	LCH	LMG	LMT
INC_t^+	-11.89***	1.07***	-4.22***	8.28	1.44***	1.33*	0.63**	1.24*
	(0.000)	(0.000)	(0.000)	(0.714)	(0.016)	(0.062)	(0.028)	(0.055)
INC_t^-	90.02***	-0.001*	-13.20***	-2.68***	0.34*	2.25	1.66**	-0.58*
	(0.000)	(0.773)	(0.000)	(0.003)	(0.081)	(0.115)	(0.042)	(0.087)
RP_t^+	35.10***	-43.06	12.51***	47.68**	0.84	0.53***	-1.80	-1.22
	(0.0062)	(0.170)	(0.000)	(0.0047)	(0.1190)	(0.0263)	(0.9890)	(0.2057)
RP_t^-	39.91***	73.48**	11.61	-63.76**	-1.29	2.45*	0.56**	-2.88*
	(0.000)	(0.025)	(0.8057)	(0.018)	(0.321)	(0.081)	(0.044)	(0.092)

Source: Author's Computation. **Note:** The statistical significance are as follows: at 1% (***), 5% (**) and 10% (*) and the p-values are in parenthesis.

Dependent variables are in **row**, while the **independent variables** are in **column** with their p-values in bracket **{ }. FD =** Food and Live Animals; **BT** = Beverage and Tobacco; **CM** = Crude Materials; **MF** = Mineral Fuels; **AV** = Animals and Vegetable Oils; **CH** = Chemicals; **MG** = Manufactured Goods; **MT** = Machinery and Transport Equipment; INC_t^+ = Real positive increased shock to Income proxied by RGDP, INC_t^- = decreased shocks (negative) to income and (RP_t^+ RP_t^-) = Relative Prices proxied by the real Exchange Rate which either can be positive and/or negative in NARDL.

The short run results in Table 8, revealed that exchange rate EXR (RP) has a negative relationship with BT, AV and MT components; and a positive relationship with FD, BT, MF, MT and CH, while INC has a positive relationship

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with all the imports components except with BT. In summary, on the disaggregated level where the impacts of income and exchange rate were evaluated on the different components of imports in the short run, it was found that positive shock to FD has a positive relationship with both income (INC) and exchange rate (EXR). Similarly, FD, BT, MF, AV, CH, MG and MT all have a direct relationship with both income (INC) and exchange rate. (EXR). Hence, while both positive and negative shocks to income (INC) significantly influences all the components of imports, positive and negative shocks to exchange rate (EXR) does not except for FD, BT, MF, AV, CH and MG. The error correction term, ECM (-1) is negative and statistically significant, confirming that the model adjusts to long term equilibrium whenever there is a short-term disequilibrium.

This finding reinforces the cointegration test results, confirming the presence of a long-run relationship among the variables. In other words, it confirms that the stability of the model and disequilibrium in real imports is corrected annually. The ECM coefficients of -0.7259, -0.432, -0.932, -0.200, -0.352, and -0.631 were all statistically significant at the 1% level, suggesting that approximately 73%, 43%, 93%, 20%, 35%, and 63% of the disequilibrium from the preceding year is corrected annually. This result implies a relatively fast adjustment of short-run deviations back to the long-run equilibrium. Specifically, about 73%, 43%, 93%, 20%, 35% and 63% of the short-term imbalances in real imports are corrected annually. This suggests that Nigeria's import demand adjusts relatively quickly to shocks in the determinant factors of imports under study. This finding demonstrates that any disruptions in real imports caused by changes in determinants and key variables like relative price and income are corrected over time, ensuring long-term export led growth than import.

Table 8: Short Run NARDL Model Estimates of Disaggregated Imports Determinants in Nigeria

Variables	FD	BT	CM	MF	AV	CH	MG	MT
ΔINC^+	61.98***	1.07***	2.44***	8.29**	0.566	1.564***	-0.734	2.126**
	(0.000)	(0.000)	(0.000)	(0.543)	(0.455)	(0.004)	(0.544)	(0.043)
ΔINC^-	90.02***	-0.001*	19.57***	47.68**	2.63***	3.828***	4.450***	3.425***
	(0.000)	(0.773)	(0.000)	(0.047)	(0.001)	(0.000)	(0.000)	(0.002)
ΔER^+	-21.00***	-43.06	68.32	6.20	-0.282	0.421*	-0.553*	-0.183
	(0.1066)	(0.170)	(0.000)	(0.863)	(.0.751)	(0.082)	(0.091)	(0.851)
ΔER^-	21.05***	73.48**	11.61	6.38***	3.630***	0.216	8.822***	2.920***
	(0.0000)	(0.025)	(0.8057)	(0.018)	(0.006)	(0.832)	(0.000)	(0.005)
ECM	-	-0.432**	-0.932***	-0.200***	-0.253	-0.582	-0.3524**	-0.631**
	0.7259***	(0.000)	(0.000)	(0.000)	(0.760)	(0.672)	(0.032)	(0.041)
	(0.000)							

Source: Author's Computation

Note: The statistical significance is as follows: at 1% (***), 5% (**) and 10% (*). **Dependent variables** are in row while the **independent variables** are in column. **FD =** Food and Live Animals; **BT** = Beverage and Tobacco; **CM** = Crude Materials; **MF** = Mineral Fuels; **AV** = Animals and Vegetable Oils; **CH** = Chemicals; **MG** = Manufactured Goods; **MT** = Machinery and Transport Equipment; **TI** = Total Imports; **INC** = Real Income proxied by the RGDP, and **ER** = Real Exchange Rate also known as RP.

Post Estimation Tests

The probability and significant values of f-Statistics in Table 9 was found significant at 5%, and being greater than 5% i.e. ($p > 0.05$), indicates that the model in this study is free from issues and econometric problems of serial correlations, omitted variable, endogeneity and

bias, misspecification errors and heteroskedasticity. This became further confirmed through Ramsey Reset test, thus, showing that the models of this study are correctly specified, stable and adequate.

Table 9 Diagnostic and Stability Tests

Jarque–Bera normality test	**0.6243**
Breusch–Godfrey Serial Correlation LM test	1.1293 (0.3453)
Breusch–Pagan-Godfrey: Heteroskedasticity Test	0.5672 (0.8510)
ARCH test	0.1705 (0.5174)
Ramsey RESET test	1.2101 (0.9529)

Source: Author's Computation. **Note:** In the diagnostic and stability tests, we reported F-statistics and figures in parenthesis are the probability values which are all greater than 5%.

Conclusion

This study investigated imports demand behaviour and imports determinants in Nigeria via both aggregate and disaggregate levels of imports between 1970 and 2024 using the Non-linear ARDL and bounds testing approaches to examine cointegration between imports and its determinants. Hence, to bridge existing gaps and contribute to advance literature, our study adopted both aggregate and disaggregate imports frameworks alongside the Non-linear Autoregressive Distributed Lag (NARDL) technique, with keen focus on Pre and Post Structural Adjustments Programme eras. The findings indicated that imports demand determiners namely, incomes (INC) and relative prices (RP) are cointegrated in short and long run. In other words, imports demand in Nigeria were found to be income elastic ($INC = e_y > 1$) and price elastic ($RP = e_P > 1$) across horizons, as prices and incomes are greater than unity and one (1). This outcome confirms that Marshall-Lerner and J-Curve effects conditions hold true in Nigeria and are fully satisfied, thus, implying that significant changes in relative prices (RP) and incomes (INC) are required to meaningfully reallocate trade flows, trade drivers and trade balances in an economy like Nigeria. Therefore, it follows that the study's approach could become a candidate model for understanding the imports demand behaviour and imports determinants in Nigeria and some other developing countries. This study has shown that the Nigerian economy is perturbed by real and nominal factors of imports demand determinants and determining variables like incomes (INC) and relative prices (RP). This however, reinforces an adequate need of government interventions in global trade markets, so as to ensure better trade flows, global trade drives, internal trade surplus and reduce trade deficits in Nigeria.

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