AFRICAN CONTINENTAL FREE TRADE AREA AND NIGERIA'S MACROECONOMY: CONCERN FOR IMPORTED INFLATION

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Abstract

The African continental Free Trade Area (AfCFTA) is poised to creating a single continental market for the free movement of goods and services within the African Continent. This paper specifically investigates the effect of imports within the framework of AfCFTA on imported inflation in Nigeria. In general, it examines the African continental Free Trade Area and Nigeria macroeconomy with concern for imported inflation in the country. Annual time series data from World Bank's development indicators, Central Bank of Nigeria Statistical Bulletin 2018 and United Nations conference on Trade and Agreements (UNCTAD) were used. To achieve the objectives of this study, various econometric tests were carried out on the variables such as the Augmented Dickey- Fuller (ADF) test, Philips-Peron test, Bound test, CUSUM test, as well as Error correction mechanism. The econometric techniques adopted for the study were multiple regression method based on Auto regressive and Distributed Lag (ARDL). Results from the ARDL Model demonstrate that although, imports from Morocco have a positive nexus with inflation in Nigeria, supplies from Cameroon have shown to have negative and insignificant impact on inflation. This implies that imported inflation has risen significantly following the increased liberalisation of imports from Morocco and liable to be induced by the AfCFTA agreements. This result suggests that Nigeria's policy makers should take advantage of the AfCFTA framework to create stronger ties with Cameroon for the supply of her chemical products and cut down on demand for these products from other AfCFTA member states. This will help curtail rise in import prices for the benefit Nigeria's macro economy in the long run.

Key Words: Free Trade Area, Imported Inflation, Imports, AfCFTA, Nigeria, Africa, ARDL Model
JEL Classification codes: E 30, E 31, F 13, L 11

1. Introduction

Over the past century, countries in Africa have created several regional economic integration arrangements with the overriding objective of promotion of intraregional trade to achieve faster economic prosperity, reduce poverty and ensure macroeconomic stability, Abrego, Zamaróczy, Gursoy, Issoufou, Nicholls, Perez-Saiz, and Rosas (2020).The first two, the Southern African Customs Union (SACU), formed in 1910, and the East African Community (EAC), formed in 1919, are today among the most vibrant and successful regional arrangements on the continent. In 2019, there were over 15 regional integration arrangements, and many countries have overlapping memberships. The overriding objective of these arrangements is for the promotion of intraregional trade which will help to achieve faster economic growth and reduce poverty with Africa Continental Free Trade Area (AfCFTA). This is the most ambitious initiative in this vein,

providing a framework for trade liberalization of goods and services at full implementation (de Meloand Tsikata, 2015).

In a bid to increase trade of goods and services with other African countries, Nigeria signed the African Continental Trade Agreement (AfCTA) on Sunday 7 July, 2019 on a day the agreement was to be launched as its 54th member state. As the largest economy in the continent, the AfCFTA offers great potentials for Nigeria in terms of fast-tracking its development process in several ways. First, with about 190 million people. Nigeria has the largest population in Africa, which places the country as a huge market in the continent. Second, the country is the biggest economy in the continent with nominal GDP of about US$444.9 billion in 2019 in purchasing power parity (PPP) terms and as the biggest player in the Economic Community of West African State (ECOWAS) regional bloc [Nigeria Economic Society (NES), 2020; World Bank Report, 2020].

As an open economy, studies have shown that Nigerians have a high penchant for foreign goods with heavy reliance on imports of finished and semi-finished products from within the African continent and beyond (Adeleye, Ogundipe, Ogundipe, Ogunrinola and Adediran, 2019; Otto, 2009). This according to Otto, (2009) is partly due to its low industrial status and the flow of economic resources from petroleum products. As at 2008, about N80 billion was targeted for rice imports (a product Nigeria could export). Nigeria imports several agricultural products which she has capacity to be net exporter for, thus losing substantial revenue from these products (Otto 2009). This dependence has meant that whatever inflation that exists in the international market is imported into the country thereby making imported inflation an expectant phenomenon in the country. Apart from agricultural products, clothes, chemical produce, wood, minerals, automobiles and household consumers are increasingly imported from across countries who have signed the African Continental Trade Agreement with South Africa, Ivory Coast, Benin, Ghana, Niger, Togo, Egypt, Morocco, Congo and Eswatini forming the top largest import sources for Nigeria respectively:

FIGURE 1. NIGERIA'S TOTAL IMPORTS FROM AfCFTA MEMBERS ($'000) 1995-2018
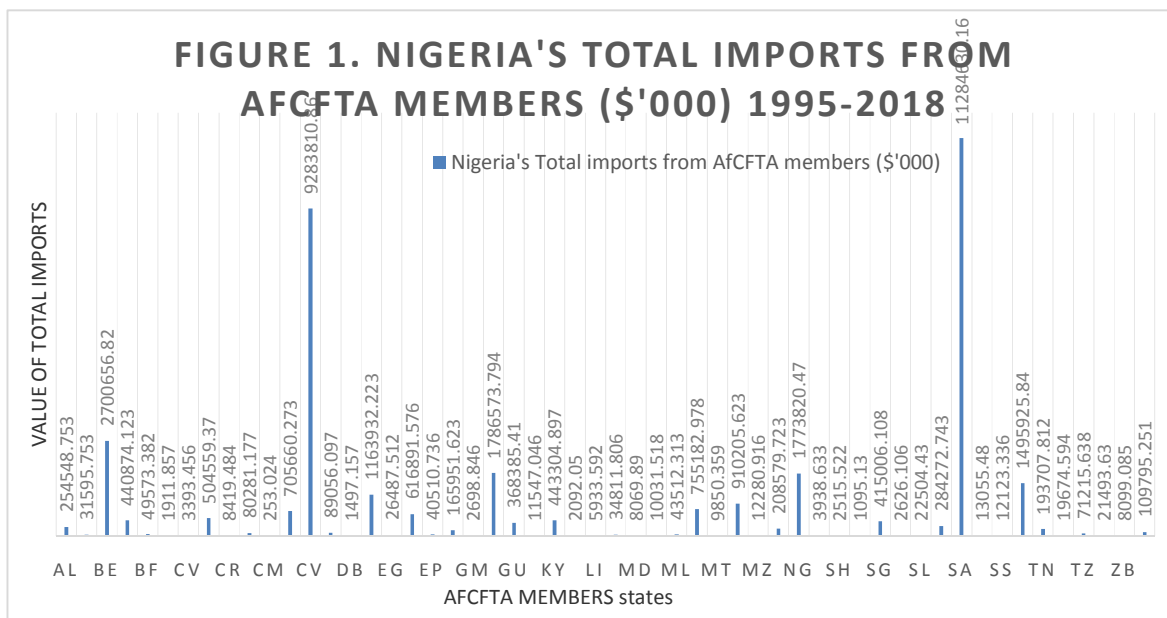
Source: United Nations Conference on Trade and Developments (UNCTAD) (2020)

In Nigeria, the concern for imported inflation is high since inflation is a function of import prices (Arestis and Sawyer, 2002). Imported inflation impinges directly on the economy via four channels. First, an increase in import prices will lower the relative price of domestic goods,

thereby raising demand for these goods. Secondly, it will affect the balance of payments, thereby directly influencing the domestic money supply. Thirdly, a rise in prices abroad will cause domestic producers to raise prices. Finally, an increase in the price of imported goods will ceteris paribus, raise the over-all cost of living (Turnovsky and Kaspura, 2016).According to the World Bank (2020), Nigeria inflation rate for 2018 was 12.09%, a 4.43% decline from 2017. Nigeria inflation rate for 2017 was 16.52%, a 0.85% increase from 2016 and has volatile over the years as shown in figure 2:

Figure 2. Inflation Rates in Nigeria (1995-2018)
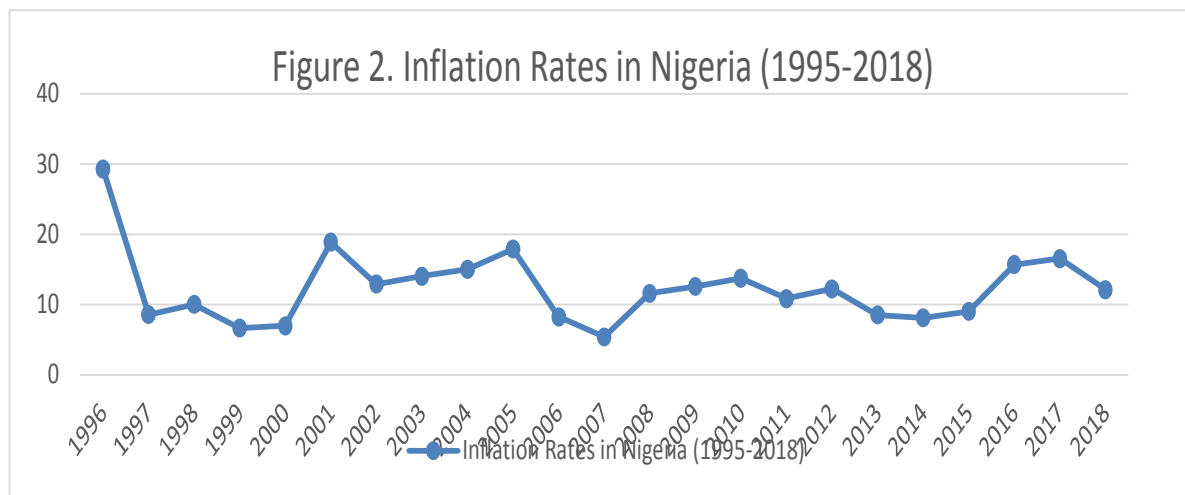
Source: World Bank Indicators (2020)

As shown in fig2, Nigeria faces immense challenges in regulating imports and achieving domestic price stability. Hence, it remains doubtful whether the AfCTA policy of reducing trade barriers and import policy making in Nigeria has achieved success. Some of the main challenges facing Nigeria macroeconomic climate is her import dependent tendencies (Ubi, Lionel, & Eyo, 2012). Most importantly is the problem of her import dependent on industrial sector and the weakened bargaining strength of her currency occasioned by the continual fall in the price of crude oil (her economic mainstay). One of the cited advantages of the free trade area is that it will increase competition which will further bring down prices of traded commodities across the continent (Zhu, 2019). For Nigeria, little or no attention is given to the factor market (such as OPEC and other key players in the oil industry) outside of AfCFTA where Nigeria's input prices are being determined. As a result, cost push inflation (imported inflation) sets in and Nigeria's commodity prices may become higher than the average prices in the continental free trade area, thereby leading to glut and dumping placeif policy measures are not put in place to checkmate this.

In the light of the above discourse, reviewed empirical studies (Perez-Saiz, 2019; [1]UNECA, 2018; Kebe, 2019; Fofack, 2018; Bello and Gass, 2018; Zhu, 2019, UNCTAD, 2018) on the Macroeconomic implication of the African Continental Free Trade Area (AfCFTA) have been centered on the economic growth and trade flows, with none emphasizing on the concern for imported inflation into Nigeria being the largest Economy via free import trade from the regional economic communitiess on the continent. This implies that investigations of such as it relates to Nigeria is rare, to the best of our knowledge. The work of (Turnovsky and Kaspura, 2016) which asnalysed imported inflation in a short-run macroeconomic model is

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[1] United Nations Economic Commission for Africa (UNECA)

focused on Canada and Austrsalia without relating it to a free trade area, therefore, generalized findings may not be adequate for policy prescription concerning Nigeria's macroeconomy; hence the need for a country specific study for Nigeria inflationary trend. To this end, the crucial questions to be answered are: to what extent do importation within the AfCFTA framework impacts on inflation in Nigeria? What is the trend of AfCFTA transactions trend that fuels inflation for Nigeria?

Following the introduction, the rest of the paper is structured as follows; the next section provides stylized facts on AfCFTA and imported inflation for Nigeria. Section 3 provides a review of literature. Section 4 details the theoretical framework and methodology, while section 5 presents and discusses the empirical findings. Section 6 concludes the paper with some policy recommendations.

Stylized Facts on the African Continental Free Trade Area (AfCFTA) and Imported Inflation in Nigeria

The African Continental Free Trade Agreement (AfCFTA), which came into force in May of 2019, is currently the world's largest free trade zone (based on number of countries) since the founding of the World Trade Organization in 1995. 54 out of 55 African countries have signed the agreement, with the only non-signatory being Eritrea (Zhu 2019). The free trade area comprises 1.3 billion people, encompassing a $3.4 trillion economic bloc. As part of the agreement, trade will be gradually liberalized through the removal of tariffs on most goods across Africa. In addition, AfCFTA seeks to progressively eliminate non-tariff barriers (NTBs) which play a significant role in hindering intra-African trade. Intra-African trade remains low despite steady increases in recent decades; intra-African exports make up 19% of total African exports, in contrast to 69% for intra-Europe trade (UNECA, 2018, Zhu, 2019).

Nigeria has over the years, maintained trade relationship with member of the AfCFTA with a view to achieving the objectives of the free trade area. This has been eminent following the diversified range of products being imported form countries across the African continent into Nigeria as shown in figures 3-9. From the regional economic communities on the continent, countries which form the largest import locations for Nigeria are Morocco, Ivory Coast, Egypt, Kenya, Cameroon and South Africa, from the respective eight regional economic communities which are recognized as the building blocks of the African Union – [2]AMU, [3]ECOWAS/CEN-SAD, [4]COMESA, [5]IGAD/EAC, [6]ECCAS, and [7]SADC (UNECA, 2020).

From the figures 2 above, it can be seen that around the time of introduction of AfCFTA around 2018 and 2019, there have been massive fluctuations on general price levels in Nigeria. As noted by the World Bank (2020), Nigeria's inflation rate for 2018 was 12.09%, a 4.43% decline from 2017. Nigeria inflation rate for 2017 was 16.52%, a 0.85% increase from 2016 and has volatile over the years as earlier shown in figure 2 above. However, a further breakdown of the import trends shows that Nigeria has over the years, imported items such as fuels, plastic and rubber, etc., of which it has comparative advantage as shown in table below:

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[2] Arab Maghreb Union (AMU)
[3] Economic Community of West African States (ECOWAS)/The Community of Sahel-Saharan States (CEN-SAD)
[4] Common Market for Eastern and Southern Africa (COMESA)
[5] Intergovernmental Authority on Development (IGAD)/East African Community (EAC)
[6] Economic Community of Central African States (ECCAS)
[7] Southern African Development Community (SADC)

Table 1: Stylized fact on Nigeria's import trade from selected member states within the AfCFTA

| Selected AfCFTA member	Top Imported Commodities by Nigeria	Value of Imports ($ '000)	Year
Cameroon	Chemicals Vegetables	35,893.45 23587.33	2017
Egypt	Textiles and Clothing Fuels	53516.81 43243.12	2018
Morocco	Chemicals Food Products	101731.17 29905.47	2018
Ivory Coast	Fuels Chemicals	74335.38 66081.11	2018
Kenya	Vegetables Textile and Clothing	13811.61 3873.15	2014
South Africa	Plastic and Rubber Machineries and Electrical appliances.	102322.41 61313.04	2018

Source: Researcher's computation with data from WITS (2020)

2. Literature Review

Imported Inflation is a type of inflation suffered by economies with high reliance on imported goods or services. Such inflation could arise from the dumping of goods in the importing economy either as inputs or final output (Otto & Ukpere, 2016). The high prices of these imported goods are transmitted into the local economy which leads to an inflationary tendency as conceptualized below:

Figure 3. Conceptual Framework on import prices and imported inflation
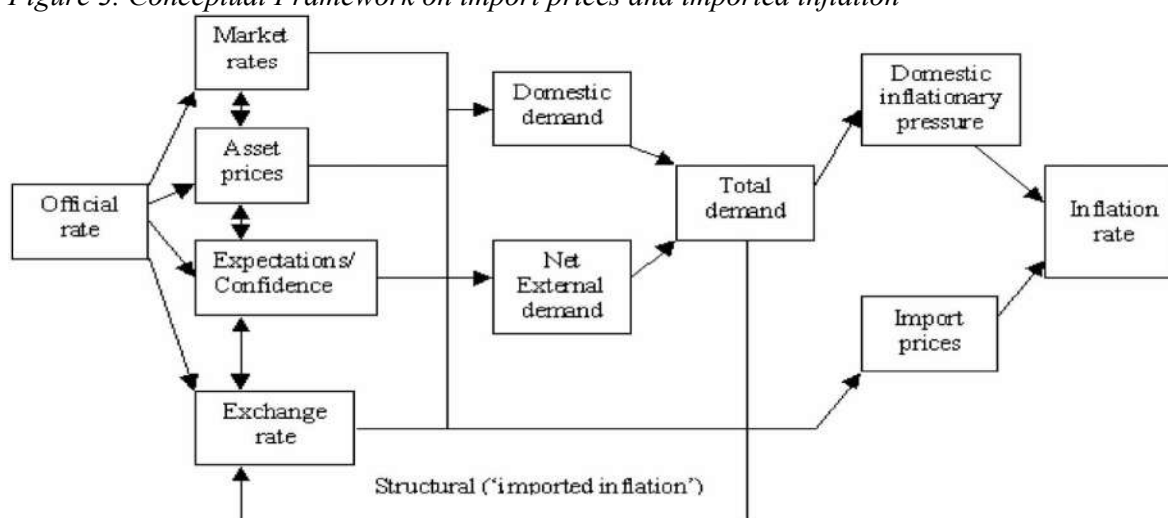
Source: Arestis and Sawyer, (2002)

2.1 Theoretical Literature
The Structuralizes Theory of Inflation (Imported inflation)

The structuralists theory maintained that less developed countries by the nature and size of their economies are more vulnerable to inflationary tendencies, Argy (1970). They based this argument on the fact that there are stringencies or holdups such as, economic rigidities, institutional and socio- political influences in these countries, in varied ways that obstruct output growth. Looking at inflation from the supply side of the economy, the theory identifies some mechanisms that fuel inflation

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as low inelastic supply of food items and agricultural products due to foreign exchange shortage and the presence of bottlenecks in the agricultural sector (Azumah, 2016).

The structuralist model of imported inflation is based on imported capital and intermediate goods are essential inputs in the production process of developing countries (Taylor, 1983 & Wijnbergen, 1983 as cited by Nell, 2014). In line with this view, the ability of developing countries to finance imported goods is limited by an acute foreign exchange shortage. The shortage of foreign exchange earnings is mainly because many developing countries only export a few primary commodities (or low technology labour intensive products) with relatively low income elasticities in world markets, while the demand for imports has a high income elasticity (Nell, 2014). Based on these assumptions, the inflation process can briefly be described as follows; A rise in the demand for imported goods financed by increases in the demand for bank credit, which is accommodated by the monetary authorities. The high demand for imported capital and intermediate goods and the shortage of foreign exchange reserves, inevitably place pressure on the current account of the balance-of-payments and lead to rise in import prices and rise in general price level.

Wage Theories and Prices

According to Keynes's Law of demand contained in the book of Fellner and Haley (1949), a general reduction of price for labour will lead to a reduction in costs, in incomes, and in demand. Keynes pointed out that costs incurred in producing any commodity constitute the incomes out of which comes the demand. Thus, under certain circumstances a change in wages and so in total costs including normal profits will bring an equal change in demand. The implication is that, if wages constitute costs and if a rise in costs brings about a rise in prices and inflation from the cost-push school of thought, then increase in wages brings about increase in prices and inflation which is the wage-push inflation. Another aspect of the theory is that if increased wages raises income

level, consumers' purchasing power is enhanced which creates an increased aggregate demand and with a given aggregate supply, prices go up hence inflation sets in. In another vain, when employers translate the increased wages into high prices, it leads to wage- price spiral triggering inflation (Azumah, 2016).

2.2 Empirical Literature

A number of studies have been conducted to unravel the way forward for member nations on the ratification of the AfCFTA agreements. UNCTAD (2018) investigated the challenges and opportunities of tariff reduction of African Continental Free Trade Area amongst African countries using the trend analysis on intra African trade in goods in four different scenarios. The results indicate significant welfare gains output and employment expansion and intra African trade growth in the long run. The study indicated that both cost and benefits are reduced if sensible products are exempted from liberalisation and recommended that there will be free flow of capital as more member nations ratify the policy for their benefits.

Jibrilla (2018) investigated the African Continental Free Trade Area (AfCFTA) and its implications for Nigeria employing descriptive technique with secondary data from Central Bank of Nigeria, this study discovers that Nigeria can well fit into the Free Trade Area. The study further suggested that since Nigeria has the opportunity to benefit from the Free Trade Area more than any other country in the continent, AfCFTA ratification should be fast tracked by the policy makers.

Perez-Saiz (2019) estimate welfare gains based on a computable general equilibrium simulation (CGE) of a complete removal of intra-African tariffs and a 35% reduction in NTBs, modelled as ad valorem tariff equivalents. The finding reveals that a removal of tariffs increased welfare in Africa by only 0.05%, while reducing NTBs increased welfare across the continent by 1.7%. Based on the findings, the study recommended that there should be the policy should not economic pressure which would pressure workers into migration under difficult and unsafe conditions.

UNECA (2018) models AfCFTA using the MIRAGE CGE model through a double qualification approach. Their findings show that the overall GDP of the continent increases by only 1%, which can be explained by 83% of African exports directed towards foreign countries. They conclude from its results that AfCFTA "will be a game changer for stimulating intra-African trade". As recommendation however, the study implored African countries to key into the AfCTA as it will increase in intra-African trade between 15% ($50 billion) and 25% ($70 billion).

Using the descriptive method on the other hand, Fofack (2018) indicates the challenges in successfully liberalizing intra-African trade, including institutional resistance and the large costs of infrastructure development needed to boost trade. Among other findings, the study observes the large role of NTBs in hindering trade between African countries as of today, specifically border delays, multiple licensing requirements, and intensive sanitary inspections and regulations and suggested that countries within the regional economic communities will create a single market and deepen the economic integration of the continent.

Also, using trend analysis and investigating the income inequality and economic integration within the AfCFTA framework, Bello and Gass (2018) noted that tremendous income disparities across African countries could problematize continental integration, making it hard to bring win-win outcomes for all countries involved. While Egypt, Nigeria and South Africa combine to account for over 50% of Africa's GDP, the six sovereign island nations of Africa combined account for only 1%. Diversified economies such as Ethiopia and Cote d'Ivoire are projected to benefit the most from AfCFTA in the short term, while economies with large manufacturing bases such as South Africa and Kenya are able to export to more destinations. As suggestion however, the study implored resource-dependent economies such as the Republic of Congo and Chad which risk being outcompeted by more diverse, to diversify their economic base to reap the benefit of free trade.

From the reviewed studies above, it is quite easy to deduce that studies involving the AfCFTA and macroeconomic performance are very scanty. However, due to the dart in literature on the tendency of AfCFTA on influencing imported inflation, this study therefore fills this gap by focusing on a specific country (i.e., Nigeria).

3.0. Methodology

In analysing the African continental free trade area's prospect of causing imported inflation for Nigeria, the study made use of a 2-stage econometric procedure. First, the Augmented Dickey-Fuller (ADF) test was conducted to ascertain the order of integration of the variables, then the Auto Regressive and Distributed Lag (ARDL) model was employed to account for long-run and short-run dynamics. The ARDL model was introduced originally by Pesaran and Shin (1999) and further extended by Pesaran et al. (2001). The ARDL approach has the advantage that it does not require all variables to be I(1) as the Johansen framework and it is still applicable if we have I(0) and I(1) variables in our set. The study employed annual secondary time-series data on total imports from Morocco, Ivory Coast, Egypt, Kenya, Cameroon and South Africa since they form the largest import sources from the respective eight regional economic communities which are recognized as the building blocks of the African Union – AMU, ECOWAS/CEN-SAD, COMESA, IGAD/EAC, ECCAS, and SADC (UNECA, 2020), exchange rates and inflation rates from 1995 to 2018. The trading members were selected based on the fact they represent Nigeria's largest import market amongst members of their respective regional economic communities. Morocco, Ivory Coast, Egypt, Kenya, Cameroon and South Africa form the largest individual import sources from AMU, ECOWAS/CEN-SAD, COMESA, IGAD/EAC, ECCAS, and SADC respectively (UNECA, 2020). The data are obtained from the (UNCTAD, 2020), World Bank Development

Indicators (WDI, 2020) and Central Bank of Nigeria Statistical Bulletin (2018).

3.1 Model Specification

From the selected variables above, we draw a function for imported Inflation for Nigeria in line with the postulations of Arestis and Sawyer (2002) who hinted that import prices (being a function of exchange rates) and net external demand/imports (which is facilitated by the existence of a free trade area) forms the key determinants of imported inflation. Our model is thus given as:

$$INF = f(MCO, CIV, EGT, KEN, SAF, CMR, EXR) \quad (1)$$

Where *INF* is Nigeria's inflation rate, CIV is value of Nigeria's import from Ivory Coast, MCO is value of Nigeria's imports from Morocco, *EGT* is value of Nigeria's imports from Arab Republic of Egypt, *KEN* is value of Nigeria's imports from Kenya, *SAF* is value of Nigeria's imports from South Africa, *CMR* is value of Nigeria's imports from Cameroon and EXR is real exchange rate. Since the study is

a time series analysis, the equation can be expressed as:

$$INF_t = \beta_0 + \beta_1 MCO_t + \beta_2 CIV_t + \beta_3 EGT_t + \beta_4 KEN_t + \beta_5 SAF_t + \beta_6 CMR_t + \beta_7 EXR_t + \varepsilon_t \quad (2)$$

Here, ε_t represents the white noise error term at time t, β_0 is a constant which represents the estimated value of inflation rates when the explanatory variables are zero. β_{1-7} are the slope coefficients of $MCO, CIV, EGT, KEN, SAF, CMR$ and EXR respectively while *t* represents the time index. *l* = the natural logarithm of the variable.

The a priori expectation of the explanatory variables in the model is expected to be; $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6 > 0$ while $\beta_7 < 0$.

These expectations are based on the structuralist model of imported inflation in that high demand for imported capital and intermediate goods and the shortage of foreign exchange reserves inevitably place pressure on the general price level in the country.

4.0 Presentation and Analysis of Results

4.1 Correlation Matrix

Table 2: Correlation Matrix of the Indicators

Correlation	INF	LCIV	LEGT	LKEN	LSAF	LMCO	LCMR	EXR
INF	1.000000							
LCIV	-0.269772	1.000000						
LEGT	-0.433706	0.777789	1.000000					
LKEN	-0.331263	0.851778	0.920428	1.000000				
LSAF	-0.345083	0.910544	0.898406	0.909067	1.00000			
LMCO	-0.137178	0.578469	0.798488	0.761652	0.74060	1.00000		
LCMR	-0.248747	0.698960	0.660455	0.622681	0.72602	0.66543	1.00000	
EXR	-0.304433	0.396908	0.763846	0.732500	0.56073	0.80081	0.36042	1.000000

Source: Authors' compilation, 2020

Result in Table 2 above gives a preliminary idea of the relationship among the variables. A brief look at the table shows that all the variables have negative relationships with INF. However, there exist positive relationships among the selected explanatory variables – CIV, EGT, KEN, SAF, MCO, CMR and EXR. By implication however, all the variables have negative and moderate relationship with inflation.

4.2 Time Series Properties of the Variables

The Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root tests were conducted for each series, and the results are presented in Table 3.

Table 3: Results of Unit Root Tests

Variables	Augmented Dickey-Fuller (ADF)		Phillip Perron (PP)		Decision
	First Difference	I(d)	First Difference	I(d)	
INF	-12.03386	I(0)	-12.38875	I(0)	I(0)
LCIV	-7.304925	I(1)	-6.895619	I(1)	I(1)
LEGT	-5.863416	I(1)	-5.947913	I(1)	I(1)
LCMR	-6.879782	1(1)	-7.567538	1(1)	1(1)
LKEN	-4.059797	I(1)	-4.059797	I(1)	I(1)
LSAF	-4.272282	I(1)	-4.272282	I(1)	I(1)
LMCO	-4.161723	1(1)	-4.106646	1(1)	1(1)
EXR	-3.506894	I(1)	-3.513416	I(1)	I(1)

Note: *, ** and *** denote 1%, 5% and 10% level of significance respectively Source: Computed by the Author with E-views 9.1
Source: Authors' compilation, 2020

The results of Augmented Dickey Fuller (ADF) unit root tests depicted in table 3 verifies that of the Phillip Perron (PP) tests. The results indicates that while inflation rate (INF) was stationary at level, imports from Ivory Coast (LCIV), imports from Egypt (LEGT), imports from Cameroon (LCMR), imports from Kenya (LKEN), imports from South Africa (LSAF), imports from Morocco (LMCO) and real exchange rate (EXR) became stationary only after the first difference. Simply put, the PP test confirmed that of the ADF test. Since the order of integration of the variables are mixed and none of the variables is stationary at second difference, it becomes necessary to employ the ARDL model which is the appropriate modus operandi of analysis that captures the combination of I(1) and I(0) stationary variables, according to Pesaran et al (2001), is the ARDL model. The primary form of the ARDL model is given as:

$$\Delta INF_t = \beta_0 + \sum_{i=1}^n \beta_{1i} \Delta INF_{t-1} + \sum_{i=1}^n \beta_{2i} \Delta CIV_{t-1} + \sum_{i-1}^n \beta_{3i} \Delta EGT_{t-1} + \sum_{i=1}^n \beta_{4i} \Delta CMR_{t-1} +$$
$$\sum_{i=1}^n \beta_{8i} \Delta KEN_{t-1} + \sum_{i=1}^n \beta_{6i} \Delta SAF_{t-1} + \sum_{i=1}^n \beta_{7i} \Delta MCO_{t-1} + \sum_{i=1}^n \beta_{8i} \Delta EXR_{t-1} + \alpha_1 INF_{t-1} +$$
$$\alpha_2 CIV_{t-1} + \alpha_3 EGT_{t-1} + \alpha_4 CMR_{t-1} + \alpha_5 KEN_{t-1} + \alpha_6 SAF_{t-1} + \alpha_7 MCO_{t-1} + \alpha_8 EXR_{t-1} + \mu_t \qquad (4)$$

where Δ is the first difference operator, β_0 is the drift component and μ_t is the white noise error term.

The equation above connotes the term with the summation sign represents the error correction dynamics i.e. β_{1-8}, while the second part α_{1-8} represents the long-run relationship. Accounting for the short-term relationship, the primary form becomes;

$$\Delta INF_t = \alpha_0 + \sum_{i=1}^n \alpha_{1i} \Delta INF_{-1} + \sum_{i=1}^n \alpha_{2i} \Delta CIV_{-1} + \sum_{i-1}^n \alpha_{3i} \Delta EGT_{t-1} + + \sum_{i=1}^n \alpha_{4i} \Delta CMR_{t-1} +$$
$$\sum_{i=1}^n \alpha_{5i} \Delta KEN_{t-1} + \sum_{i=1}^n \alpha_{6i} \Delta SAF_{t-1} + \sum_{i=1}^n \alpha_{7i} \Delta MCO_{t-1} + \sum_{i=1}^n \alpha_{8i} \Delta EXR_{t-1} + \delta ECT_{t-1} +$$
$$\varepsilon_t \qquad\qquad (5)$$

Where ECT is the error correction term which is the residuals retrieved from the estimated long-run relationship.

4.3 Lag Length Selection

The next step in our analysis is to select the optimal lag length for the cointegration equation based on the hypothesis that the residuals are serially orthogonal. The lag length which minimises the Akaike Information Criterion (AIC) and Schwarz Criterion (SC) and at which the model does not have autocorrelation is the optimal lag length. For this analysis, we would make use of the SC as the choice for the selection of our optimal lag length.

Table 4: Lag Length Result

Lag Length	AIC	SC
0	25.03627	25.43122
1	17.54916*	21.10375*

Source: Authors' computation (E-views 9.1), 2020

Based on the result in table 4, the lag length which minimises SC is lag one and thus our optimal lag length. Given our optimal lag length, we proceed to test for long-run relationship among the variables.

4.4 Bound Test

To investigate the presence of long-run relationships among the variables, the bound testing under Pesaran, et al. (2001) procedure was used. The bound testing procedure was based on the F-test. The F-test is basically a test of the assumption of no cointegration among the variables against the premise of its existence, denoted as:

$$H_0: \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = \beta_7 = 0$$

i.e., there is no cointegration among the variables.

$$H_1: \beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq \beta_6 \neq \beta_7 \neq 0$$

i.e., there is cointegration among the variables.

Table 5: Bound Test Result

F-Statistics	1%		5%		10%	
4.096941	Lower bound	Upper bound	Lower bound	Upper bound	Lower bound	Upper bound
	2.96	4.26	2.32	3.5	2.03	3.13

Source: Authors' compilations, 2020.

Given the result of the Bound Test, the F-statistic value should be compared with the Pesaran critical value at traditional levels of significance. It is noted by Narayan (2005), that the current critical values reported in Pesaran et al (2001) cannot be used for small sample sizes because they are predicated on the premise of the existence of large sample sizes. Narayan (2001) provided a set of critical values for sample sizes ranging from 30 to 80 observations. They are $2.496 - 3.346$ at 10% level of significance, $2.962 - 3.910$ at 5% level of significance and $4.068 - 5.250$ at 1% level of significance.

Since the F-statistic 4.096941, is greater than the upper bound critical value at 5% level of significance (3.79), we thus reject the null hypothesis and conclude that inflation rates, imports from Ivory Coast (LCIV), imports from Egypt (LEGT), imports from Cameroon (LCMR), imports from Kenya (LKEN), imports from South Africa (LSAF), imports from Morocco (LMCO) and real exchange rate (EXR) have co-movements in the long-run in Nigeria. From the result, we can hence estimate the long-run relationship between imports from selected member states of AfCFTA and inflation in Nigeria.Once it has been established that a long-run cointegration relationship existed,

equation (4) is estimated using the ARDL specification. The result obtained by
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normalizing on ΔINF_t in the long run is reported in Table 6

Table 6: **Estimated long run coefficients using the ARDL approach**
Dependent Variable: (INF)

Long Run Coefficients				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	89.704906	40.255062	2.228413	0.0500*
LMCO	6.363956	2.853148	2.230504	0.0498**
LCIV	-0.863051	2.616731	-0.329820	0.7483
LEGT	5.421601	3.182635	1.703495	0.1193
LKEN	2.006536	3.548002	0.565540	0.5842
LSAF	-8.468176	6.632586	-1.276753	0.2305
LCMR	-8.992518	3.168882	-2.837758	0.0176**
EXR	-0.067379	0.043671	-1.542857	0.1539
R-squared= 0.890745	Adjusted R-squared= 0.759638		F-stat(prob)= 6.79057 (0.002441)	Durbin-Watson= 2.124500

Note: Dependent variable INF; ***(**)[*] indicates rejection of the null hypothesis at 1% (5%)[10%] significance levels respectively.
Source: Authors' compilations, 2020.

The estimated coefficients of the long-run relationship shows that imports from Morocco and Cameroon had significant impact on inflation in Nigeria, as a unit rise in the imports from morocco as an AfCTA member state increases inflation by 6.36 and from Cameroon, reduces inflation by 8.99. Although, imports from Morocco have a negative nexus with inflation in Nigeria, supplies from Cameroon have shown to have negative and insignificant impact on inflation. This suggests that imported inflation has risen significantly following the increased liberalisation of imports from Morocco induced by the AfCFTA agreements. The results also show that exchange rate had a negative and insignificant impact on inflation in the economy, as a percent rise in exchange rate reduces inflation by 6.7%. This implies that rate of exchange have not really affected import prices into Nigeria from the import destination on the continent. The results further reveal that imports from Ivory Coast had South Africa have negative and insignificant effect on inflation in Nigeria, with 0.86 and 8.47 fall in inflation after a unit rise in the respective imports in the long run. Imports from Kenya and Egypt both have positive but insignificant nexus with inflation in Nigeria and showing a 2.01 and 5.42 rise in inflation after a unit rise in the respective import value.

Table 7: ARDL short-run relationship
Dependent Variable: (INF)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
C	60.74013	25.60806	2.371914	0.0391**
INF(-1)	0.322890	0.061000	5.293255	0.0004***
LMCO	8.104565	2.360717	3.433096	0.0064***
LMCO(-1)	-3.795464	2.047264	-1.853921	0.0934*
LCIV	-0.584381	1.767273	-0.330668	0.7477
LEGT	1.565059	1.564895	1.000105	0.3408
LEGT(-1)	2.105964	1.586541	1.327393	0.2139
LKEN	1.358646	2.391940	0.568010	0.5826
LSAF	1.750403	3.460783	0.505782	0.6240
LSAF(-1)	-7.484293	3.138590	-2.384604	0.0383**
LCMR	-2.580964	1.320404	-1.954678	0.0791*
LCMR(-1)	-3.507964	1.529339	-2.293778	0.0447**
EXR	-0.045623	0.029363	-1.553741	0.1513
ECM				
R-squared= 0.890745	Adjusted R-squared= 0.759638	F-prob = (0.002441)	F-stat = 6.79057	Durbin-Watson= 2.124500

Source: Authors computation (E-views), 2020
Note: Dependent variable INF; ***(**)[*] indicates rejection of the null hypothesis at 1% (5%)[10%] significance levels respectively.

The result of the short-run dynamic coefficients associated with the long-run relationships obtained from the ECM equation (5) is reported in Table 6. The signs of the short-run dynamic impacts are maintained to the long-run save imports from South Africa which have positive but insignificant impact on inflation in Nigeria. The result implies that, although insignificantly, increasing imports from South Africa fuels inflation in the short run. Also, a unit rise in imports from Cameroon will insignificantly reduce inflation by 2.5.

The estimated coefficient for the error correction term had negative sign and significant at 1% level. The results also confirm that imports from the selected AfCFTA members key trade partners on inflation in Nigeria has an automatic mechanism which responds to deviations from equilibrium in a balancing manner. A value of -0.677 for the ECM coefficients suggests a fast speed of adjustment strategy of 68%. This means that approximately 68% of discrepancy in the previous year is adjusted for the current year.

This explains that the whole system can achieve long run equilibrium at the speed of about 68% in one year. The regression for the underlying ARDL equation (5) fits very well at R^2 of 89%. The reason for being a good fit is that it is statistically above the bench mark of 50 percent. As the adjusted (R^2) tends to purge the influence of the number of included explanatory variables, the (R^2) of 0.76 shows that having removed the influence of the explanatory variables, the model is still of good fit and the dependent variable explained by the equation by 76 percent, hence, in terms of the goodness of fit it can be inferred that the test is fair. The Durbin-Watson value of 2.12 indicates that this model is free from serial correlation. Although, Kenton (2020) noted the Durbin–Watson statistic is not suitable for serial correlation test especially when lagged dependent variables are included in the explanatory variables. Thus, we go further by using the LM test to confirm the non-existent of serial correlation in our model as indicated in Table 8. According to Pesaran and Shin (1999), the stability of the estimated coefficient of the

error correction model should also be graphically investigated. A graphical representation of the Cumulative Sum (CUSUM) and the Cumulative Sum of Square (CUSUMSQ) of the Recursive Residual were also established. The cumulative sum (CUSUM) and cumulative sum of squares (CUSUMSQ) plots which is shown in Figure 4 and 5 from a recursive estimation of the model also indicate stability in the coefficients over the sample period.

Table 8: Serial Correlation Test

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	1.280579	Prob. F(2,8)	0.3292
Obs*R-squared	5.577667	Prob. Chi-Square(2)	0.0615

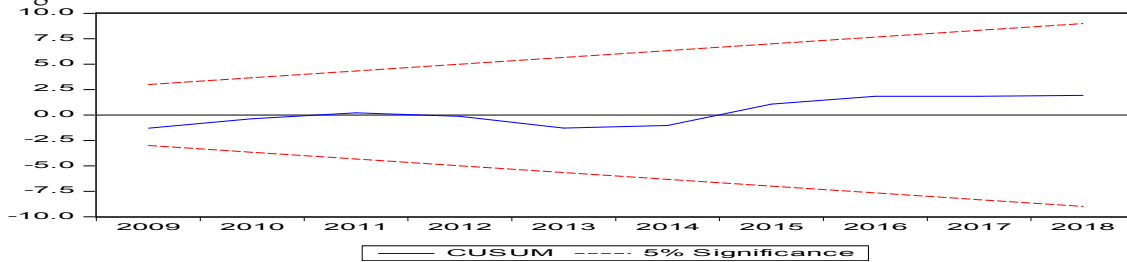*Source: Authors' computation (E-views), 2020*

Given the probability value of 0.0615 percent, we fail to reject the null hypothesis and conclude that our short run model is free from serial correlation.

4.5 Stability Test Summary

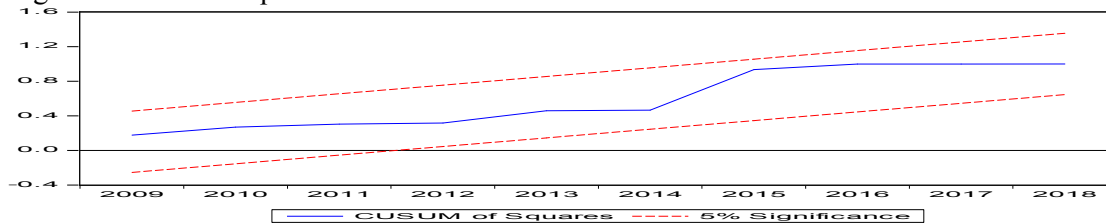The cumulative sum (CUSUM) test and cumulative sum (CUSUM) of squares test were adopted to test the stability of the model. The results of the test are shown below in figures 4 and 5 respectively.

Figure 4: CUSUM test

Source: Authors' compilation (using E-views 9.1), (2020)

Figure 5: CUSUM square test

Source: Authors' compilation (using E-views 9.1), (2020)

The existence of parameter instability is established if the cumulative sum of the residuals and CUSUM square go outside the area between the two critical (dotted) lines. From the figures above, it can be seen that the stability of the model is established; since the CUSUM and CUSUM Square lie within the critical lines.

5.0 Conclusion and Recommendations

In this study, concern has been shown for imported inflation in Nigeria as a macroeconomic implication for AfCTA ratification using the structuralist theory on imported inflation. Also, foreign inflation as induced by imports from the selected AfCFTA members in their regional economic communities has been estimated using the

Autoregressive and Distributed Lag (ARDL) and ADF model techniques as well the trend analysis on major Nigeria's import commodities from the selected countries.

Results reveal that there exists long-run relationship among inflation rate, exchange rates, Nigeria's import trade from Morocco, Ivory Coast, Egypt, Kenya, South Africa and Cameroon. The result also shows that in the short-run model, the interaction among imports from morocco, Egypt, Kenya, South Africa and inflation rates follows apriori expectations while imports from Ivory Coast and Cameroon do not follow apriori expectations. Further findings shows that, the liberalisation of trade on the AfCFTA framework is expected to further increase importation for Nigeria especially on commodities such as chemicals, vegetables, textile and clothing, fuels, food products, plastics and rubber, machineries and electrical appliances. One of the implications of these results is that, since the foreign exchange rate has a negative insignificant impact on the general price level in Nigeria, the nation is immune to inflationary shocks arising from factors affecting foreign exchange. In other words, change in imports prices generally will not lead to significant change in imported inflation in Nigeria. Although within the AfCTA framework, concerns are expected to be given to countries such as Morocco which import values has significant positive impact on the rising inflation in Nigeria both in the short run and long run. On the other hand, imports from Cameroon does not support inflation in Nigeria.

As recommendations however, Nigerian policy makers should take advantage of the AfCFTA framework to create stronger trade ties with Cameroon for the supply of her chemical products and cut down on demand for these products from other AfCFTA member states. Significantly, this will help curtail rise in import prices for the benefit of Nigeria's macroeconomy in the long run. Also, Nigeria should deemphasize on the imports from the northern part of the continent and leverage on the free trade area to explore supplies from countries such as Ivory Coast and Kenya for substitute commodities. This is to enable the reduction in the cost of freight and other factors to be borne by Nigeria owing to nearness to market and other logistics.

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Appendix

AfCFTA Countries	Code	AfCFTA Countries	Code
Algeria	AL	Libya	LB
Angola	AG	Madagascar	MD
Benin	BE	Malawi	MW
Botswana	BT	Mali	ML
Burkina Faso	BF	Mauritania	MA
Burundi	BR	Mauritius	MT
Cabo Verde	CV	Morocco	MC
Cameroon	CA	Mozambique	MZ
Central African Republic	CR	Namibia	NB
Chad	CH	Niger	NG
Comoros	CM	Rwanda	RW
Congo	CG	Saint Helena	SH
Côte d'Ivoire	CV	Sao Tome and Principe	ST
Dem. Rep. of the Congo	CO	Senegal	SG
Djibouti	DB	Seychelles	SY
Egypt	ET	Sierra Leone	SL
Equatorial Guinea	EG	Somalia	SM
Eswatini	EW	South Africa	SA
Ethiopia	EP	Sudan	SD
Gabon	GA	South Sudan	SS
Gambia	GM	Togo	TG
Ghana	GH	Tunisia	TN
Guinea	GU	Uganda	UG
Guinea-Bissau	GB	United Republic of Tanzania	TZ
Kenya	KY	Western Sahara	WS
Lesotho	LT	Zambia	ZB
Liberia	LI	Zimbabwe	ZW