



# **Competitiveness of Nigerian Cashew Nuts in the Global Market (1961 – 2016): An Application of Vector Error Correction Model (VECM)**

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## **ABSTRACT**

Cashew grows almost everywhere in Nigeria. Cashew is a major cash crop with high potential to generate foreign exchange and to create employment, as well as curb desertification in Nigeria. The continuous increase in cashew production will depend on the international competitiveness and the effects of policy intervention. This paper analysed the competitiveness of Nigeria's cashew nuts in the global market. Secondary data were used for this study; national annual aggregates from 1961-2016. The aggregates were obtained from the Food and Agriculture Organization (FAO) website, Annual Abstract of Statistics of the National Bureau of Statistics (NBS), and Annual Reports of the Central Bank of Nigeria (CBN). Descriptive statistics such as line graphs were used to examine the trends in cashew nuts production, export and competitiveness. Also, Phillips Perron co-integration test and vector error correction model (VECM) were used to determine the drivers of competitiveness of Nigerian cashew nuts in the global market. From the results, the total quantity of cashew nuts export from Nigeria was 704,221 metric tons and the average volume was 12,575.37 metric tons from 1961-2016. The lowest comparative advantage (RCA) of 0.7% was recorded in 1968, while the highest comparative advantage of 209.7% was recorded in 1989, which can be attributed to the structural adjustment policy in 1985. The lowest coefficient of variation was 0% in the 1971-1980 sub-period and the highest was 92.82% in the 1991-2000 sub-period, showing high instability in the production of cashew nuts in Nigeria. Annual growth rate in cashew nuts export quantity was highest (114.15%) in the 1981-1990 sub-period while it was lowest (-7.66%) in the 1991-2000 sub-period. The revealed comparative advantage (RCA) from 1961-2016 was 182.77 percent, showing high instability in RCA as shown by coefficients of variation, ranging from 102.59 percent to 21.2 percent. Results of vector error correction analysis showed that world price of Nigeria's cashew ( $p \leq 0.05$ ), inflation rate ( $p \leq 0.05$ ), export quantity ( $p \leq 0.05$ ) and production quantity ( $p \leq 0.05$ ) significantly influence Nigeria's cashew competitiveness in the world market. It was concluded that world price of Nigeria's cashew and inflation rate impede competitiveness while export quantity and production quantity improve it. Policies to sustain and improve the observed production and export quantities and lower inflation rates will improve competitiveness of Nigeria cashew nuts.

**Keywords:** Competitiveness, Comparative advantage, Inflation rate, Export quantity, Production quantity

## **1.0 INTRODUCTION**

Globally, Cashew nuts are produced in Africa, Latin America and South East Asia. The leading producing countries of these regions are Vietnam, India, Brazil, Indonesia and Nigeria. The world production quantity of raw cashew nuts stood at 4,898,210 metric tons, with a gross production value of US\$4,287,466.57 at constant price (FAOSTAT, 2016). India, Vietnam and Brazil are the highest importers of Cashew nuts in the world, importing 65.26%, 32.70% and 0.87% respectively of the total import quantity (FAOSTAT, 2016). According to the Centre for Promotion of Imports from developing Countries (CBI, 2017), processing capacity in these two countries (India and Vietnam) exceeds the crop

and therefore they import a lot of raw material from outside growing areas. India processes around 1.59 million tons of cashew nut every year though it produces only around half of the quantity that it processes. Also, Vietnam processes about 0.90 million tons of cashew nut every year (CBI, 2017).

International Trade Centre (ITC, 2015) explained that although Africa is the second largest raw cashew nuts producing region in the world, benefitting from availability of fertile land, favourable conditions for cashew cultivation and relatively cheap labour, it remains at a competitive disadvantage to Asian processors. Notwithstanding the importance of African raw cashew nut supply, the crop is exported unprocessed, leaving the opportunities for job creation, local value addition and poverty reduction largely untapped.

Cashew grows almost everywhere in Nigeria with production spanning across 27 out of 36 States in all the geo-political zones. Nigeria is one of the top ten cashew nuts producers in the world. The production of cashew nuts is estimated to about 100,000 tons of raw nuts per annum. About 60 to 70% of the local production is commercialized of which about 90% is exported in the form of raw nuts. Cashew is a high potential export-oriented agricultural crop and represents 7 to 8% of non-oil export earnings (ITC, 2011). Despite the dominance of this crop in many states, yield per hectare is not encouraging.

According to FAO (2016), Nigeria's yield in terms of Cashew Nuts is relatively low at 23, 922 kg/ha in 2016, when compared to yields from other countries within the same period such as Peru (47,756 kg/ha), Philippines (75,521 kg/ha), Vietnam (43,447kg/ha) and Mexico (24,971 kg/ha). Its product potentials had not been well harnessed due to varied factors ranging from low yielding plantations to inadequate farm management, processing facilities and marketing problems. Most cashew trees start bearing fruit in the third or fourth year and are likely to reach their mature yield by the seventh year with favourable conditions. The average nut yield of a mature tree is in the range of 7-11 kg per annum (Azam-Ali and Judge, 2004).

Cashew is largely produced on small scale, and the average delivery per farmer is roughly 300kg per hectare per season. The export free on board price of raw cashew nuts has fluctuated between US\$3,000 - 3,500 per tonne from January to August 2010, while the local market price of cashew nuts per ton ranges from US\$2667 to 3333 (~~₦400,000.00~~ to ~~₦500,000.00~~) to deliver it to Lagos, Nigeria, point of export (1 USD = 150 NGN) (Ayemibo, 2010; Nwachukwu *et al.*, 2010). The estimated value of raw cashew nuts exports from Nigeria varies from US\$ 25 to 35 million annually. The incentive to add value through increasing quality supply is low with Nigerian raw nuts prices discounted in the world market (20%-30%) compared to those of neighbouring countries (Patrick and Oroch, 2005).

Cashew is a major cash crop with high potential to generate foreign exchange and to create employment, as well as curb desertification in Nigeria. The crop is an important industrial raw material with rising demand in the confectioneries, food, and beverage industries. It is important in the conservation of environment. Industrial demand for the commodity is also increasing in the international markets. The continuous increase in cashew production will depend on the international competitiveness and the effects of policy intervention (Kaplinsky, 2004). The removal of all forms of tariffs will change the structure of economic incentives. This, in turn, will cause major adjustments in the pattern of production, allocation of resources and trade flows.

In order to analyse the competitiveness of Nigerian Cashew Nuts in the global market, this paper answers the following questions:

- i. What are the trends in the domestic production, export quantity and competitiveness of cashew nuts in Nigeria?
- ii. What are the growth rates in the domestic production, export quantity and competitiveness of cashew nuts in Nigeria?
- iii. What factors influence the competitiveness of Nigerian Cashew nuts in the World market?

**2.0 METHODOLOGY**

**2.1 Study Area**

This study covers Nigeria. Nigeria is situated in the West African region and lies between latitudes 4<sup>0</sup>N to 14<sup>0</sup>N and longitudes 3<sup>0</sup>E to 15<sup>0</sup>E. It has a land mass of 923,768 sq.km. It is bounded in the north by Niger Republic, in the west by Benin Republic and in the east by Cameroon Republic. The country’s topography ranges from lowlands along the coast and in the lower Niger Valley to high plateaus in the north and mountains along the eastern border. Much of the country is laced with productive rivers. Nigeria’s ecology varies from tropical forest in the south to dry savanna in the far north, yielding a diverse mix of plant and animal life.

**2.2 Sources and Types of Data**

Data used by the study were national annual aggregates obtained from secondary sources. Data on Nigerian Cashew nut production quantity, domestic cashew nut export quantity and Nigerian agricultural production quantity which covered the period under study (1961-2016) were mainly obtained from several issues of the Production Yearbook published by the Food and Agriculture Organization (FAO), and FAOSTAT website. Also, data on Gross Domestic Product were obtained from National Bureau of Statistics (NBS) Annual Abstract of Statistics and several issues of the Central Bank of Nigeria’s (CBN) Annual Reports databases.

**2.3 Analytical Techniques**

Descriptive statistics such as line graphs and time series analysis such as (Phillips perron test, co-integration test and vector error correction model) were used to analyse the data.

**2.3.1 Descriptive statistics**

Table and Line graphs were used to capture the trends in the cashew nuts production, export and competitiveness between the periods of 1960 and 2016.

**2.3.2 Competitiveness / Revealed Comparative Advantage (RCA)**

Competitiveness was measured by revealed comparative advantage of Nigeria’s cashew nuts in the global market. This is done by calculating the proportion of a country’s share of exports for a single commodity to the exports of all commodities and the similar share for a group of selected countries, expressed by Boansi (2013) as follows:

$$RCA_{ij} = \left( \frac{X_{ij}}{X_{it}} \right) / \left( \frac{X_{nj}}{X_{nt}} \right) \dots\dots\dots (1)$$

Where, *X* means export,  
*i* indicates a given country, *j* is a given product, *t* is a group of products and  
*n* is the group of selected countries

In computing the RCA index for this analysis;  
*X<sub>ij</sub>* represents Nigeria’s total cashew export, *X<sub>it</sub>* represents Nigeria’s total agricultural export.  
*X<sub>nj</sub>* represents world’s total cashew export, *X<sub>nt</sub>* represents world’s total agricultural export

**2.3.3 Phillips-Perron Test**

Phillips and Perron (1988) developed several unit root test that have become popular in the analysis of financial time series. The Phillips-Perron (PP) unit root tests differ from the Augmented Dickey Fuller (ADF) tests mainly in how they deal with serial correlation and heteroskedasticity in the errors. Where the ADF tests use a parametric autoregression to approximate the autoregressive-moving-average model (ARMA) structure of the errors in the test regression, the PP tests ignore any serial correlation in the test regression. The test regression for the PP tests is t

$$\Delta y_t = \beta \cdot D_t + \pi y_{t-1} + u_t \dots\dots\dots (2)$$

Where *u<sub>t</sub>* is I (0) and may be heteroskedastic; condition in which the variance of the residual term, or error term, in a regression model varies widely.

Empirical research based on time series presumes that observed data are stationary. That is, such a series has a mean; variance and auto covariance at several lags that are time invariant. However, most macroeconomic variables exhibit trends. That is, they grow over time. Thus, the implication of working with non-stationary series results in spurious regression (Nelson and Plosser, 1982; Newbold and Granger, 1974). Thus, forecasting and policy implication drawn from such spurious regression analysis would be misleading. A possible way out is to employ the use of unit root testing procedure to ascertain the stationarity of the series and order of integration of the series. This study used the well-known Phillip–Perron (PP) test by Phillips and Perron (1988).

**2.3.4 Johansen Co-integration**

A co-integration test was performed to determine the existence of long-run relationship among the variables. This is to ensure that the regression of the variables will be meaningful and non-spurious. It would also show if a long run relationship exists among the variables. If the trace statistic and the Max-Eigen statistic are greater than the 5% critical values, the null hypothesis of no co-integration will be rejected in favour of the alternative hypothesis at that level. The trace statistic and the Max-Eigen statistic show that there is co-integration among the variables implying a long run equilibrium relationship. The Johansen co-integration was used to investigate the existence of a long-run relationship between the variables.

**2.3.5 Vector Error Correction Method (VECM)**

The Vector Error Correction Model (VECM) was used to determine the factors influencing the competitiveness of Nigeria’s cashew nuts in the world market. Following, Ahmad and Ghazi (2014), the general vector error correction model adopted for this study to eliminate the problem of spurious estimates is of the form:

$$RCA = (\beta_0 + \beta_1INFL_t + \beta_2INT_t + \beta_3EXCH_t + \beta_4PPRIC_t + \beta_5WCE_t + \beta_6PRODQTY_t + \beta_7NCE_t + ECM_{t-1} + \mu_t) \dots\dots\dots (16)$$

Where:

- RCA* = Revealed comparative advantage.
- INFL* = Rate of inflation in the economy (percentage).
- INT* = Interest rate on agricultural loans (percentage).
- EXCH* = Exchange rate in the economy (percentage).
- PPRIC* = Producer price of Nigeria’s cashew (in US\$).
- WCE* = World cashew nuts export (in tons).
- PRODQTY* = Nigeria Production quantity (in tons)
- NCE* = Nigeria’s cashew nuts export (in tons).
- β's* = unknown parameters to be estimated.
- ECM<sub>t</sub>* = error correction factor.

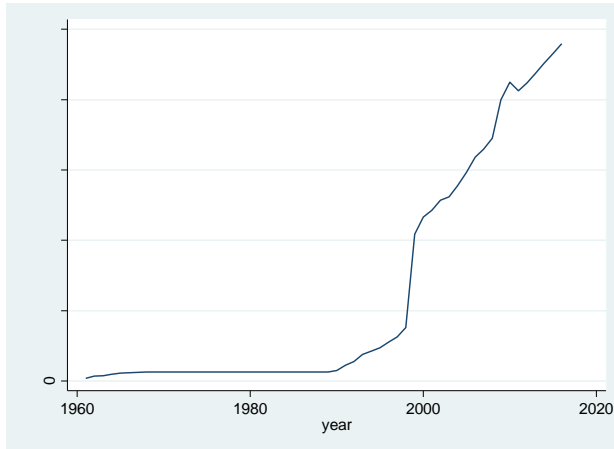
**3.0 RESULTS AND DISCUSSIONS**

**3.1 Trends in the domestic production, Export quantity and Competitiveness of cashew nuts in Nigeria**

**Trend in the domestic production (tons) of cashew nuts in Nigeria**

Domestic production has been on consistent increase since 1961 till 2016 as it can be seen in Figure 1. Nigeria attained the highest production peak of 958,860 metric tons in 2016. This was as a result of farmers’ response to rising international market prices of cashew nuts and adoption of improved production practices. Nigeria recorded the lowest production of 7,000 metric tons in 1961, which was before the structural adjustment programme (SAP) in 1985. The total domestic production of cashew nuts was 13,978,685 metric tons (1961–2016) and the average volume was 249,619.375 metric tons per year. The visible improvements attained suggest that the structural adjustment programme (SAP) in 1985, put in place by the government to diversify the foreign exchange earning of the country other government interventions like National Economic Empowerment and Economic Development Strategy (NEEDS) yielded result. The significant policy reforms include agricultural trade liberalization which led to abolition of marketing boards, thus ensuring fair producer prices to the farmers, the ban on importation of

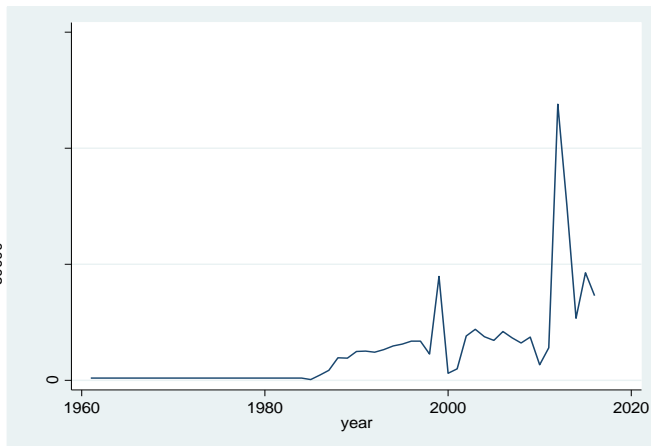
some agricultural commodities in order to encourage their domestic production, diversification of agricultural commodities with emphasis on value addition, the provision of incentives to farmers and others involved in the agricultural export trade chain and the restructuring of institutions saddled with the responsibility of monitoring the quality of agricultural exports, and agricultural export promotion in order to improve their efficiency (Federica *et al.*, 2013; Akanni *et al.*, 2009; Sekumade, 2009; Briggs, 2007; and Ogunkola *et al.*, 2006).



**Figure 1: Line graph of domestic production of cashew nuts in Nigeria (1961-2016)**  
**Source: Computed from FAOSTAT, 2019**

**Trend in the export quantity (tons) of cashew nuts from Nigeria**

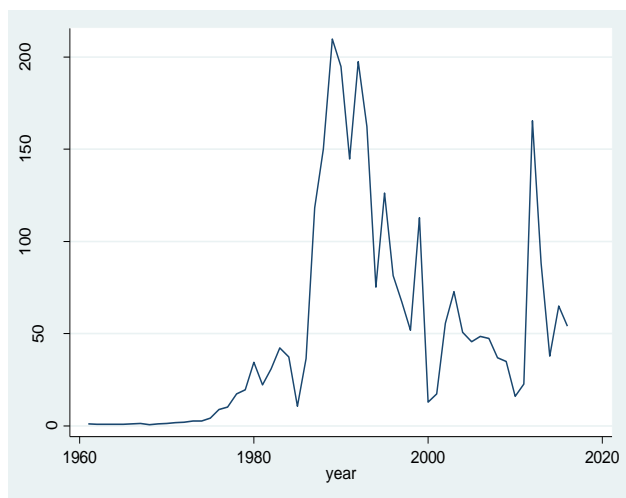
The trend of export quantity of cashew nuts from 1961 to 2016 is shown in Figure 2. Nigeria was consistent in export quantity of 1000 metric tons from 1961-1984 and fell to 232 metric tons in 1985, which can be adduced to indirect tax imposition on cashew farmers and newly emanating policy (SAP). Nigeria recorded the lowest export quantity this same year and the highest export quantity of 118,977 metric tons in 2012. The total export quantity of cashew nuts from Nigeria was 704,221 metric tons and the average volume was 12,575.37 metric tons over the period covered by the study.



**Figure 2: Line graph of export of cashew nuts from Nigeria (1961-2016)**  
**Source: Computed from FAOSTAT, 2019**

### Trend in the competitiveness (%) of cashew nuts of Nigeria in world market

The trend of competitiveness of cashew nuts in the world market from 1961 to 2016 is shown in Figure 3. It can be deduced that Nigeria's cashew nuts competitiveness dwindled over years. Nigeria recorded the lowest comparative advantage of 0.7% in 1968 which indicates that the country had no comparative advantage in exporting cashew nuts as a result of unfavourable tax imposed on cashew farmers, lack of subsidies on inputs, and etcetera. The highest comparative advantage of 209.7% was recorded in 1989, which can be attributed to the intervention of structural adjustment policy in 1985.



**Figure 3: Line graph of competitiveness of cashew nuts of Nigeria in world market (1961-2016)**

**Source: Computed from FAOSTAT, 2019**

### 3.2 Growth rates in the domestic production, Export quantity and Competitiveness of cashew nuts in Nigeria

#### Growth rate in the domestic production (tons) of cashew nuts in Nigeria

Table 1 shows the growth rate in the domestic production of cashew nuts in Nigeria. The highest annual growth rate (93.56%) in cashew nuts production was recorded in the 1991-2000 sub-period which was within the Structural Adjustment Programme (SAP) era. The lowest annual growth rate (0%) in cashew nuts production was recorded in the 1971-1980 sub-period; before the Structural Adjustment Programme (SAP) era. The all period annual growth rate in cashew nuts production was 131.47%. The coefficient of variation ranged from lowest (0%) in the 1971-1980 sub-period, to highest (92.82%) in the 1991-2000 sub-period. This shows a high instability in the domestic production of cashew nuts in Nigeria.

The major reasons for decline and instability in the volume of agricultural production, in the 1981-1990 sub-period, according to Akanni *et al.* (2009), was the oil boom which heralded an era of decay and decline in agricultural output and in the overall contribution of agricultural sector to the economy, evidenced by the Dutch disease, which made agriculture to lose its foreign exchange earnings capacity, domestic revenue importance and suffer serious policy neglect. Additionally, Nwachukwu *et al.* (2010) opined that decline in the domestic production of agricultural export commodities was due to inconsistent production patterns, problems of pests and diseases, low technology adoption and ageing of trees. Also, Ajatomobi (2011) reported that inefficient agricultural trade policies, especially the activities of the marketing boards, which created wide gap between internal prices of agricultural export commodities and producer prices received by the farmers, contributed immensely to fall in the volume of agricultural exports in the 1971-1980 and 1981-1990 sub-periods.

The growth recorded in the volume of agricultural production in the 1981-2016 period was because of massive agricultural trade policies reforms under the Structural Adjustment Programme (SAP) introduced in 1986 and National Economic Empowerment and Economic Development Strategy (NEEDS).

**Table 1: Growth rate in the domestic production (tons) of cashew nuts in Nigeria**

Sub-period	Total volume ('000 tons) per annum	Annual Percent change	Coefficient of variation
1961-1970	199000	25.7	30.65
1971-1980	250000	0	0
1981-1990	255000	2	6.2
1991-2000	1625000	93.56	92.82
2001-2010	6307861	7.52	19.37
2011-2016	5341824	2.69	5.68
<b>All Period</b>	<b>13978685</b>	<b>+131.47</b>	<b>154.72</b>

Source: Computed from FAOSTAT, 2019

### Growth rate in the export quantity (tons) of cashew nuts in Nigeria

Table 2 shows the growth in the export quantity of cashew nuts in Nigeria. The highest annual growth rate (114.15%) in cashew nuts export quantity was recorded in the 1981-1990 sub-period. The significant increase recorded in the export of cashew nuts over this period can be attributed to the effect of the Structural Adjustment Programme (SAP) between 1985 and 1989, which reduced significantly the importation of food items, as well as diversification from crude oil as the major export commodity; priority was given to the agricultural sector.

The lowest annual growth rate (-7.66%) in cashew nuts export quantity was recorded in the 1991-2000 sub-period. This situation, according to Adubi and Okunmadewa (1999), can be attributed to the volatility of the exchange rate and the increasing inflation rate which retarded the growth of the agricultural export sector. The all period annual growth rate in cashew nuts export quantity was 115.43%. The coefficient of variation ranged from lowest (0%) in the 1961-1980 sub-period, to highest (107.06%) in the 1981-1990 sub-period. This shows a high instability in the export quantity of cashew nuts in Nigeria.

**Table 2: Growth rate in the export (tons) of cashew nuts in Nigeria**

Sub-period	Total volume ('000 tons) per annum	Annual Percent change	Coefficient of variation
1961-1970	10,000	0	0
1971-1980	10,000	0	0
1981-1990	42,519	114.15	107.06
1991-2000	161,060	-7.66	0.67
2001-2010	162,824	3.35	35.58
2011-2016	317,818	5.59	72.45
<b>All Period</b>	<b>704,221</b>	<b>+115.43</b>	<b>215.76</b>

Source: Computed from FAOSTAT, 2019

### Growth rate in the competitiveness (%) of cashew nuts in Nigeria

Table 3 shows the growth in the competitiveness of cashew nuts in Nigeria. Results show that the revealed comparative advantage of cashew nuts fell by 102.17% and 0.69% a year, in the 1991-2000 and 2001-2010 sub-periods, respectively. However, revealed comparative advantage rose by 182.22 % and 77.39 % annually during the 1971-1980 and 1981-1990 sub-periods, respectively. The total revealed comparative advantage over the entire study period was 182.77 %. There is high instability in the revealed comparative advantage as shown by coefficients of variation, ranging from 21.2 % to 102.59 %.

The steady decline in the indices of competitiveness of cashew nuts, measured by market and the high degree of instability in 1961-1970 sub-period, as reported by Manyong *et al.* (2005), was due to the oil price shocks which led to influx of large foreign exchange earnings (Dutch disease), resulting into overvaluation of the naira and general price distortions, which adversely affected price competitiveness of the agricultural export commodities. There was also high rate of inflation due to increase in the wage



structure leading to drastic reduction in cost competitiveness of the agricultural export commodities, as well as flooding the local markets with high quality imported agricultural commodities at prices which were substantially lower than the unit costs of producing their local substitutes, thereby making them uncompetitive.

**Table 3: Growth rate in the competitiveness (%) of cashew nuts in Nigeria**

Sub-period	Total percentage per annum	Annual Percent change	Coefficient of variation
1961-1970	9.96	2.72	21.2
1971-1980	103.9	182.22	102.59
1981-1990	852.96	77.39	88.9
1991-2000	1032.8	-102.17	54.07
2001-2010	426.12	-0.69	40.29
2011-2016	433.12	23.3	70.51
<b>All Period</b>	<b>2,858.86</b>	<b>+182.77</b>	<b>377.56</b>

Source: Computed from FAOSTAT, 2018

### 3.3 Factors Influencing competitiveness of Nigerian Cashew nuts in the World market.

Of the seven variables that were analysed in this study, inflation rate, export quantity and production quantity significantly influence Nigeria's cashew competitiveness in the world market.

#### Phillips-Peron unit root tests

From the results in Table 4, inflation rate and Nigeria cashew export were stationary at original values while revealed comparative advantage (competitiveness), exchange rate, interest rate, producer price of cashew (US\$), world cashew export and production quantity were not stationary at their original values but stationary at first difference.

**Table 4: Results of Phillips-Peron unit root test**

Variables	I (0)	I (1)
Inflation rate	-4.687***	-7.119***
Interest rate	-1.326	-8.111***
Exchange rate	-1.554	-6.023***
Revealed comparative advantage	-1.639	-7.463***
Nigeria cashew export	-3.855**	-10.109***
Producer price of cashew	-2.515	-10.552***
World Cashew export	-1.358	-9.637***
Nigeria Production quantity	-1.391	-6.425***
<b>Critical value</b>		
1%	-4.139	-4.141
5%	-3.495	-3.496
10%	-3.177	-3.178

Source: Data Analysis, 2019.

#### Co-integration test

Results of Johansen test for co-integration used for the variables are presented in Table 5. Results show eight co-integrating equations. For the variables to attain the same wavelength, they were all differenced to the highest order of integration I (2). According to the results, the null hypothesis of no co-integration was rejected by both trace statistic and maximum Eigen statistic for cashew competitiveness and its hypothesized determinants. The trace statistic indicates eight co-integrating equations while the maximum Eigen statistic also indicates eight co-integrating equation both at 5% significance level. This implies that there is a long run relationship existing between the series (revealed comparative advantage and its hypothesized determinants) at 5% level. The presence of co-integration implies that revealed comparative



advantage, inflation rate, interest rate, export quantity, cashew price, world export, exchange rate and production quantity follow the same long run trend. That is, they co-move with one another over time. Meaning that, if all these variables are in disequilibrium, it will be easy to bring them back to equilibrium.

**Table 5: Results of Johansen test for co-integration**

Hypothesized No. of CE(s)	Eigen value	Trace statistic	5% critical value	Max. statistic	5% critical value
None	-	326.0505	156.00	87.8282	51.42
At most 1	0.85797	238.2224	124.24	77.3946	45.28
At most 2	0.82091	160.8277	94.15	53.5485	39.37
At most 3	0.69577	107.2792	68.52	50.2015	33.46
At most 4	0.67228	57.0778	47.21	26.0314	27.07
At most 5	0.43925	31.0464	29.68	14.0761	20.07
At most 6	0.26861	16.9703	15.41	10.9590	14.07
At most 7	0.21615	6.0113	3.76	6.0113	3.76

**Source:** Data Analysis, 2019.

### Short run determinants of Nigeria’s cashew competitiveness

The results of the vector error correction model (VECM) analysis, presented in Table 6, show how deviations from the long-run relationship affect the changes in the variable in the next period. That is, it shows the short-run components of the VECM. The coefficient of multiple determinations ( $R^2$ ) is 0.7152, implying that 71.52% variation in the dependent variable is explained by the independent variables. The  $\chi^2$  value of 87.89442 is statistically significant at 1 percent level (P-value of 0.000), indicating that the model fits the data well. The Durbin Watson statistic (2.34021) implies that there is no presence of serial correlation in the model. The Error Correction Coefficient is considered good if it ranges between 0 and 1 and negative, but if positive, it means the value is unreasonable (Onanuga and Shittu, 2010).

The error correction coefficient (0.0048) is positive and statistically significant at 5 percent level. The negative value of the adjustment coefficient (-0.895) indicates that the model is dynamically stable, and this implies that 1% of the disturbance in the short run is corrected for each year or the system adjust any disequilibrium towards long run equilibrium state at 89.5 percent speed of adjustment.

The coefficient of inflation is significant ( $p \leq 0.05$ ) and negatively influence cashew competitiveness. The sign on the coefficient shows that there is an inverse relationship between inflation rate and the country’s competitiveness. This implies that one percent increase in the inflation rate will lead to 9.94 percent decrease in the country’s cashew competitiveness. This result is in accordance with the findings of Yusuf and Yusuf (2007) that hike in price of agricultural inputs negatively affects agricultural production and trade export which has a similar effect on competitiveness.

The coefficient of world (producer) price of Nigeria’s cashew nuts is significant ( $p \leq 0.05$ ) and negatively influence cashew competitiveness. The negative sign on the coefficient shows that there is an inverse relationship between price of cashew nuts and the country’s competitiveness. This implies that one percent increase in the Nigeria’s producer price of cashew nuts in the world market will lead to 54 percent decrease in the country’s cashew competitiveness. This result corroborates the findings of Nwachukwu *et al.* (2013) that increase in price of agricultural commodities does not improve exports and have similar effect on competitiveness.

The coefficient of production quantity is significant ( $p \leq 0.05$ ) and positively influence cashew competitiveness. The positive sign on the coefficient also shows a direct relationship between production quantity and the country’s competitiveness. This implies that one percent increase in production quantity of cashew will lead to 4.1 percent increase in the country’s cashew competitiveness. This result is in accordance with the findings of Taiwo (2016) and Boansi (2013) that increase in quantity produced of agricultural crops improves the quantity exported, and this has a similar effect on competitiveness.

The coefficient of the country's export quantity is significant ( $p \leq 0.05$ ) and positively influence cashew competitiveness. The positive sign on the coefficient shows that there is a direct relationship between export quantity and the country's competitiveness. This implies that one percent increase in the export of cashew nuts will lead to 25.2 percent increase in the country's cashew competitiveness. This result is in line with the findings of Boansi (2013) that increase in agricultural crop export will improve the country's competitiveness.

The world (producer) price of Nigeria's cashew nuts, inflation rate, production quantity and export quantity are the significant variables which influence the competitiveness of Nigerian Cashew Nuts in the global market (1961 – 2016).

**Table 6: Results of Vector Error Correction Model**

Error Correction	D(RCA)	D (Inflation rate)	D (Interest rate)	D (Exchange rate)	D (Producer price)	D (World export)	D (Production quantity)	D (Nigeria export)
Ecm	-0.8955*** (2.99)	-3.8719*** (-3.61)	0.3461 (1.41)	-0.5305** (-2.16)	-0.9372*** (-4.50)	0.1318 (0.38)	-0.1854 (-0.79)	-2.1749*** (-2.00)
D (Inflation rate (-1))	-0.0994** (-2.22)	-0.3159 (-2.29)	-0.0490 (-1.62)	0.5730 (1.81)	0.0355 (1.33)	0.0667 (1.48)	0.0182 (0.60)	0.1214 (0.80)
D (Interest rate (-1))	0.4451 (0.51)	0.1695 (0.05)	-0.1888 (-0.28)	0.0278 (0.04)	-0.9792 (-1.74)	2.8076 (2.79)	-0.5950 (-0.88)	-0.1662 (-0.05)
D (Exchange rate (-1))	-0.4790 (-0.63)	-1.7018 (-0.63)	-0.2852 (-0.48)	-0.4852 (-0.78)	0.7482 (1.52)	-2.8754 (-3.26)	0.3742 (0.63)	-0.4932 (-0.18)
D (Producer price (-1))	-0.5402** (-2.39)	1.1625 (1.44)	-0.2504 (0.13)	0.2840 (1.53)	-0.0057 (-0.04)	0.0008 (0.00)	0.0179 (0.10)	1.5106 (1.84)
D (World export (-1))	-0.0980 (-0.87)	-0.1784 (-0.44)	-0.0492 (-0.56)	0.0836 (0.91)	-0.0434 (-0.59)	-5.981 (-4.56)	-0.0804 (-0.98)	-0.7402 (-1.81)
D (Production quantity (-1))	0.0408** (-2.18)	-0.2488 (-0.31)	-0.0817 (-0.56)	-0.0443 (0.91)	-0.1334 (-0.92)	-0.0923 (-0.35)	-0.3991 (-2.28)	3.1042 (-3.83)
D (Nigeria export (-1))	0.2521** (-2.07)	0.2967 (1.70)	0.0051 (1.70)	0.0497 (1.24)	0.0672 (2.11)	-0.0042 (-0.08)	0.0416 (1.08)	0.0214 (0.11)
C	-0.0069 (-0.19)	-0.0013 (-0.001)	-0.0012 (-0.04)	0.0052 (0.17)	-0.0010 (-0.04)	-0.0051 (0.12)	0.0009 (0.03)	-0.0018 (-0.01)
R-squared	0.7152	0.4244	0.3269	0.3420	0.5920	0.5554	0.4424	0.5018
P>chi2	0.0000	0.0041	0.0745	0.0306	0.0000	0.0000	0.0020	0.2103

AIC = 0.2222702, HQIC= 1.524381, SBIC = 3.715151, Durbin W. = 2.340212, Breusch P.= 0.0151, Ramsey test = 0.1041

**Source:** Data Analysis, 2019.

*The asterisks (\*\*, \*\*\*) denote statistically significant level at 5%, and 1% respectively.*

*Note: Figures in parentheses are z-values associated with the respective parameters.*

#### 4.0 CONCLUSION AND POLICY RECOMMENDATIONS

It is established that world (producer) price of Nigeria's cashew, inflation rate, production quantity and export quantity significantly influence Nigeria's cashew competitiveness in the world market; world price of Nigeria's cashew and inflation rate impede competitiveness while production quantity and export quantity improve competitiveness in the long run. This implies that export quantity and production quantity are the significant variables which are the drivers of competitiveness of Nigerian Cashew Nuts in the global market (1961 – 2016).

Policies to sustain and improve the observed production and export quantities and lower inflation rates will improve competitiveness of cashew nuts. Also, encouraging cashew farmers through subsidies on farm inputs (such as high yielding varieties and fertilizers) will improve production quantity, thereby improving the competitiveness of Nigeria cashew nuts.

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