Nigeria's Cocoa Export Response to Selected Macro-economic Variables (1971-2013): A Co-integration Approach

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Abstract

This study examines Nigeria's cocoa export response to selected macro-economic variables, namely: export price, exchange rate, interest rate, domestic price of cocoa, quantity of cocoa produced and trade openness from 1971 to 2013. The specific objective was to evaluate the response of Nigeria's cocoa export to variations in these variables in the international market. Secondary data were utilized for the study and they were sourced from Central Bank of Nigeria (CBN) Statistical Bulletin, National Bureau of Statistics, Federal Ministry of Agriculture Production Yearbook and the Food and Agriculture Organization reports. Data were analyzed using graphical method to ascertain the trends in cocoa export (the dependent variable) and export price, foreign exchange rate, interest rate, domestic price, domestic cocoa production and trade openness (the independent variables respectively). Temporal properties were checked using Autoregressive Integrated Moving Average (ARIMA) model, and the meaningful long-run and short-run relationships between the variables were determined by the use of Johansen Maximum Test of Co-integration and Vector Error Correction model (VECM) respectively. The elasticity of cocoa export to the independent variables was measured by constant elasticity model. Findings revealed that the long- and short-run VECM estimated coefficients of cocoa export price (0.14 and 0.06) and foreign exchange rate (0.29 and 0.06) respectively were not significant at 5% level of significance. Furthermore, it showed that the long-run (0.14 and 0.29) and short-run (0.06 and 0.06) elasticity of export price and foreign exchange rate respectively were not statistically significant at 5% though they possessed a long-run relationship with the volume of cocoa exported over the period under review. Finally, the elasticity of other macro-economic factors such as interest rate (0.329), cocoa production (0.88) and domestic price of cocoa (0.37) favoured cocoa exports in the period under review both in the long-run and short-run. The volume of Nigeria's cocoa export was increasing, though not dramatically. Increases in the independent variables, however, appeared to be more marked. Based on the findings, it was recommended that effective promotion of cocoa exports through the National Export Promotion Council (NEPC) should be more proactive by way of providing information to farmers on the prevailing conditions in the world cocoa market to inform timely action/reaction.

Key words: Elasticity, Cocoa export, ARIMA, Vector Error Correction Model

Introduction

Nigeria's export sector is dominated by the export of primary commodities which include agricultural products, mainly cocoa, coffee, cotton, fish, live animals and unprocessed minerals such as gold, to mention but a few. Cocoa accounts for only 0.3% of Nigeria's Agricultural Gross Domestic Product (GDP) (Odeh, 2014). The average annual cocoa bean output in Nigeria between 2000 and 2010 was 389, 272 tonnes (FAO, 2013). FAO (2013) submitted that only 3% of cocoa produced in the country is utilized as staple food within Nigeria's borders. The balance is either exported or termed as "other utility."

Price and exchange rate are two major instruments for influencing the volume of export trade. Nigeria has been tinkering with these economic policy instruments to improve the prospect of demand for her commodities in the international market. The effect of such manipulation and its feedback into policy making needs to be regularly checked to ascertain the magnitude of effect and to ensure the continued relevance of such variables.

The response of cocoa exports to variations in macroeconomic variables in developing countries like Nigeria remains a controversial issue. The determinants of agricultural export are normally divided into two main parts, namely; internal and external determinants. Governments and the business communities are concerned about the consequences of an appreciation of her nation's currency on exports and local production (Liu *et al.*, 2013). However, researchers are of the view that foreign exchange rate is mainly unconnected with economic fundamentals such as exports. For instance, Dekle *et al.* (2008) discovered that elasticity of exports with respect to exchange rate is not statistically different from zero for every G-7 countries for the given period of 1982-1999. Arene *et al.* (2013) comprehensively examined the response of cocoa export market to trade policy changes in Nigeria, and observed that the Nigerian cocoa export market has been relatively unstable and would likely continue over time. The coefficients of production 101527, (in metric tonnes) and the ratio of the export price to the producer price (RPX) 2160.510 were positive and significant respectively. Ebi and Ape (2014) investigated the supply response of several agricultural export commodities in Nigeria from 1970 to 2010. An econometric Error Correction Model (ECM) was applied to evaluate export supply behaviors of the several commodities chosen: ground nut, soybeans, cocoa, benni seed, rubber, palm-oil, cotton seed, and cocoa. The findings show that the export supply response to changes in relative price was fairly significant and positive for most of products except for soybeans and cocoa which showed otherwise. Both Short-run price elasticity and non-price elasticity showed less than unity (0.01 to 0.77). Furthermore, some studies in developing countries found that internal determinants such as producer prices and internal trade policies are fairly and positively significant in some countries while other works found that external deterministic factors like export price, foreign exchange rate, trade liberalization policies are significant in determining volume of agricultural export (Kingu, 2014). In an era of varying and unstable policy regimes and macroeconomic policy variables over time, there are conflicting statements in theory on whether export price, exchange rate, interest rate, domestic price and other policy variables impede or favour cocoa export trade (Cho *et al.*, 2002). Generally, cocoa export response to export price fluctuations, exchange rate, interest rate and some other policy variables in developing countries produce mixed results and lack uniform direction (Kingu, 2014). This research uses more recent data to reexamine the situation in Nigeria.

The main objective of this study was to examine the response of Nigeria's Cocoa export to export price, exchange rate variation, interest rate, domestic price of cocoa, quantity of cocoa produced and trade openness in the international market by determining the trend in the volume of Nigeria's export of cocoa over the period 1971 to 2013, the trend and magnitude of change in the international market price of cocoa over the period under review, the trend in foreign exchange rate movement in Nigeria and the response of the volume of cocoa export to selected macroeconomic variables over the period.

Materials and Methods

The study was carried out in Nigeria. Annual time series data for the period 1971-2013 were utilized. The data were: export price of cocoa (EP), domestic prices (DP) of cocoa, interest rate (IR), exchange rate (ER), quantity of cocoa output (LCO), trade openness of cocoa export (TO) which were the explanatory variables while volume of cocoa export (CEt) measured in tons of cocoa was the explained variable. These were used as explanatory variables while the volume of Nigeria's cocoa export was the explained variable. Data were sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin (CBN, 2011, 2012), National Bureau of Statistics (NBS, 2010), Federal Ministry of Agriculture Production Yearbook (2013) and the Food and Agricultural Organization (FAO – various issues from 1971-2013).

Data analysis involved: (i) the use of graphical methods to show trends in the movements of the dependent and independent variables. (ii) checking for the temporal properties of the variables in the model for Unit Root in order to determine their stationarity using Auto Regressive Integrated Moving Average (ARIMA) and Augmented Dickey-Fuller (ADF) test. (iii) meaningful short-run and long-run equilibrium relationships between the dependent and independent variables were determined using Johansen Maximum Likelihood Test of Co-integration and Error Correction Mechanism (ECM).

Test of Unit Root

The regression equation to test for stationarity according to Gujarati (2004) is expressed as given below:

$$\Delta \ln X_t = \alpha_0 + \Sigma^p_{t-1}\alpha_1\Delta \ln CE_{t-1} + \Sigma^p_{t-1}\alpha_2\Delta \ln EP_{t-1} + \Sigma^p_{t-1}\alpha_3\Delta \ln DP_{t-1} + \Sigma^p_{t-1}\alpha_4\Delta \ln IR_{t-1} + \Sigma^p_{t-1}\alpha_5\Delta \ln ER_{t-1} + \Sigma^p_{t-1}\alpha_6\Delta \ln QC_{t-1} + \Sigma^p_{t-1}\alpha_7\Delta \ln TO_{t-1} + \beta_1\ln CE_{t-1} + \beta_2\ln EP_{t-1} + \beta_3\ln DP_{t-1} + \beta_4\ln IR_{t-1} + \beta_5\ln ER_{t-1} + \beta_6\ln QC_{t-1} + \beta_7\ln TO_{t-1} + U_t$$ .... *(eqn 1)*

The presence of unit root problem or non-stationarity was assessed through the hypothesis given as under:

H$_0$: $\alpha_1 = \alpha_2 = \alpha_3 = \alpha_4 = 0$ (the time series X_t is Non-Stationary or have unit root)

H$_a$: $\alpha_1 < 0$, $\alpha_2 < 0$, $\alpha_3 < 0$, $\alpha_4 < 0$ (the time series X_t is Stationary or does not have unit root)

Where:

α_0 = Constant term

X_t = Time series

$\ln CE_{t-1}$ = Lagged Cocoa Export

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$lnEP_{t-1}$= Lagged Export Price of Cocoa
$lnDP_{t-1}$= Lagged Domestic price of Cocoa
$lnIR_{t-1}$= Lagged Interest Rate
$lnER_{t-1}$= Lagged Exchange Rate
$lnQC_{t-1}$= Lagged Quantity of Cocoa produced
$lnTO_{t-1}$= Lagged Trade Openness
U_t = White noise
α_1- α_5= coefficients of the first-differenced explanatory variables
β_1- β_4= coefficients of the explanatory variables
p= Lag length

Augmented Dickey-Fuller (ADF) tests was carried out to test the regression results to show the existence of unit roots as expressed in the hypotheses above.

Test for Co-Integration

Johansen Maximum Likelihood Test of co-integration by simple differencing is performed to determine the existence of long-run relationship among the variables. Gujarati (2004), explained that cointegration test is carried out to determine long-term, or equilibrium relationship between two variables. This is expressed below:

$$\Delta lnXCO_t = \alpha_0 + \beta_1 lnCE_{t-1} + \beta_2 lnEP_{t-1} + \beta_3 lnDP_{t-1} + \beta_4 lnIR_{t-1} + \beta_5 lnER_{t-1} + \beta_6 lnQC_{t-1} + \beta_7 lnTO_{t-1} + U_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots.(eqn\ 2)$$

Error Correction Model (ECM):

The ECM revealed that the change in a variable at time t was not only dependent on lagged changes in its independent variables, but also on its own lagged changes. The short-run dynamic relationship was established as specified below:

$$\Delta lnCE_t = \alpha_0 + \Sigma^p_{i=1} \alpha_1 \Delta lnCE_{t-i} + \Sigma^p_{i=0} \alpha_2 \Delta lnEP_{t-i} + \Sigma^p_{i=0} \alpha_3 \Delta lnER_{t-i} + \Sigma^p_{i=0} \alpha_4 \Delta lnDP_{t-i} + \Sigma^p_{i=0} \alpha_5 \Delta lnIR_{t-i} + \Sigma^p_{i=0} \alpha_6 \Delta lnQC_{t-i} + \Sigma^p_{i=0} \alpha_7 \Delta lnTO_{t-i}\ \delta ecm_{t-1} + U_t\ \dots\dots\dots\dots\dots\dots(eqn3)$$

Where:
Δ = Speed of adjustment
$lnCE_{t-1}$ = Lagged Cocoa Export
$lnEP_{t-1}$ = Lagged Export Price of Cocoa
$lnDP_{t-1}$ = Lagged Domestic price of Cocoa
$lnIR_{t-1}$ = Lagged Interest Rate
$lnER_{t-1}$ = Lagged Exchange Rate
$lnQC_{t-1}$ = Lagged Quantity of Cocoa produced
$lnTO_{t-1}$ = Lagged Trade Openness
U_t= White noise
Ecmt-1 =Error Correction term lagged for one period

Results and Discussion

Trend in the Volume of Cocoa Export in Nigeria

Figure 1 showed that the volume of cocoa export had been fluctuating in the pre-structural adjustment programme (Pre-SAP) era (1971-1985), structural adjustment programme

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(SAP) era (1986-1994) and post structural adjustment programme (Post-SAP) era (1995-2013). It showed that Nigeria attained a peak volume of cocoa exports in the Post-SAP era at 285,623 in 2013 and a minimum export value of 92,891 in 1985 (SAP era). It can also be seen from the graph that the quantity of cocoa exported declined in the Pre-SAP era from 1971 to 1975 before it gained a little but unstable increase, and it kept fluctuating into the SAP and Post-SAP era. In the Pre-SAP era, the volume of cocoa export stood at 271,738 tonnes in 1971 and 92,891 in 1985. SAP era recorded a value of 148,426 in 1986 and 187,000 in 1994. It was also observed that the Post-SAP recorded 132,713 in 1995 and 285,623 in 2013. This fluctuating trend of cocoa is in line with Arene and Nwachukwu (2013) who opine that Nigeria's cocoa export value has been fluctuating and would likely continue that way over time. In all, we can say that there was a relative increase in the export of cocoa over these different policy regimes, though there were fluctuations. It also shows that the trend of cocoa export over this same period has been relatively unstable.
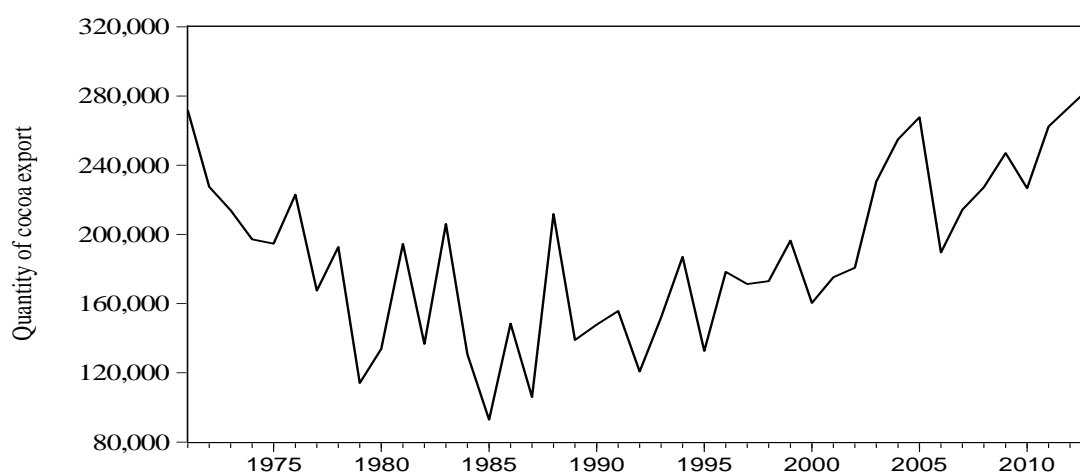

Figure 1: Trend in the Volume of Cocoa Export

Trend and Magnitude of Change in the Export Price of Cocoa

Figure 2 indicates a sharp upward and downward movement of international and local market prices of cocoa. Price variation in the cocoa market is mainly due to the liberalization of the marketing system, and forces of demand and supply with little or no intervention by the government in the Pre-SAP and SAP periods. Pre-SAP era recorded a steady increase in export price of cocoa from 1972 to 1979 owing to Nigeria's contribution to world agricultural product export during this period (Olomola, 2007). There was a sharp fall in the export price from 3782 in 1979 to US$1818 in 1980. In the SAP era, the fall continued steadily to as low as US$57 in 1992. Post-SAP era recorded a sharp increase in 1995 to of US$1192 and again decline from1996 to 1998. The fluctuating trend continued up to 2013. Arene and Nwachukwu (2013) attributed the sharp decline in the quantity of cocoa export to political instability during the SAP and early Post SAP periods that made the international community to place export sanctions on Nigeria.
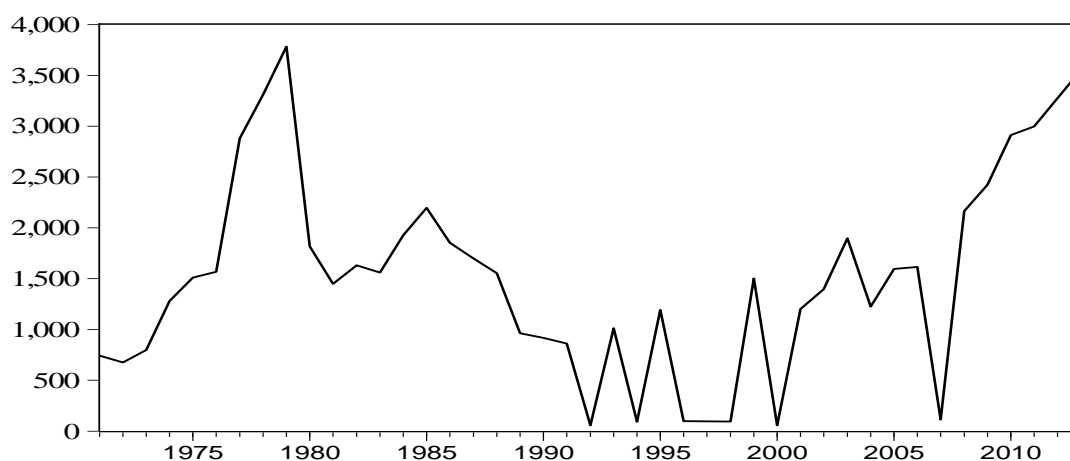
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Figure 2: Trend in the change of Export price of Cocoa.

Trend in Foreign Exchange Rate Movement in Nigeria

Figure 3 shows the trend in foreign exchange rate movement in Nigeria. Exchange rate movement has been unstable and with remarkable increase since 1998. That is the post-SAP era. The figure showed a slight and unnoticeable increase in early Pre-SAP era (1971-1983). During the SAP era, there was a steady increase in exchange rate between the Nigerian Naira and the United States dollar, and recorded a high value of 22.05 in 1993, The period, 1994 to 1998, recorded a rigid and unchanged exchange rate of 21.88 owing to government intervention to regulate exchange rate movement during this period, and this had an adverse effect on the quantity of cocoa that was exported during that same period. In the Post-SAP era, exchange rate increased steadily from 1999 to 2013 with a highest value of N159.88 to 1 US$.
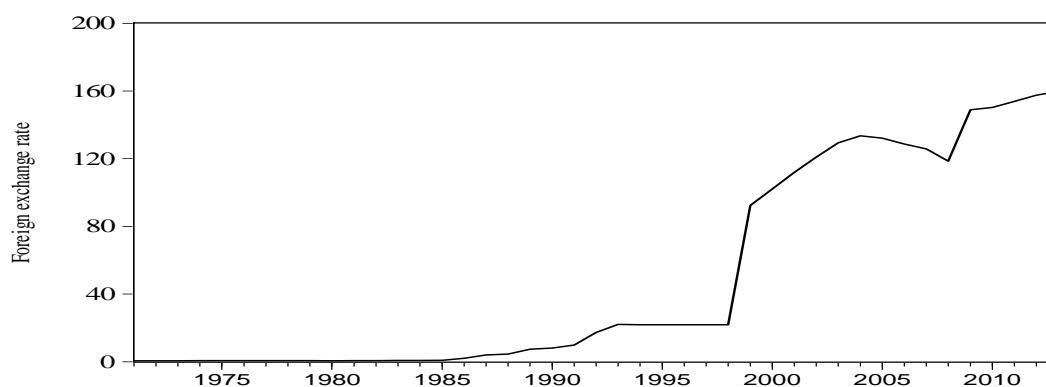

Figure 3: Trend in foreign exchange rate movement in Nigeria

Exchange rate increase over these policy regimes can also be attributed to the discovery of oil and neglect of the agricultural sector which mounted pressure on the naira and caused its depreciation when compared to foreign currencies especially the United States dollar (Ettah, Akpan and Etim, 2011).

Table 1 shows the regression estimates of volume of cocoa exports over the period under study. The R^2 value of 0.66 (66%) explains variation in volume of cocoa export by variation in time. It means that 66% of the variation in volume of cocoa exported over the period studied can be explained by variation in time. The t value of -1.86 shows that QCE (-1) is

negative and not statistically significant at 5% critical level.. This indicates that there was steady increase in the quantity of cocoa export over the period reviewed (1971-2013). The F-statistic (9.85) and P-value (0.000) showed that the coefficient was significant at 1% level.

Table 1: Estimated Regression of Trend of Volume of Cocoa Exports

Variable	Coefficient	Standard Error	t-Statistic	Probability
QCE(-1)	-0.312233	0.167474	-1.864366	0.0718
D(QCE(-1))	-0.506617	0.178183	-2.843249	0.0078*
D(QCE(-2))	-0.303913	0.179467	-1.693423	0.1004
D(QCE(-3))	-0.380527	0.167689	-2.269248	0.0304*
D(QCE(-4))	-0.583100	0.132905	-4.387337	0.0001**
C	9613.523	26343.49	0.364930	0.7176
R^2= 0.66	**Adj.R^2=0.60**	**F-stat= 9.85**	**P =0.000**	

Source: Extracted from Results Provided by E-view Econometric software
** Significant at 1%, *Significant at 5% level.

Table 2 shows the regression estimates of cocoa export price over the period under review (1971-2013). The R^2 value of 0.19 (19%) explains variation in cocoa export price by variation in price. It means that 19% of the variation in cocoa export price over the period studied could be explained by variation in time. The t value of -1.39 shows that EXPRICE (-1) was negative and not statistically significant. This indicates that there was steady increase in the cocoa export price over the period (1971-2013). The F-statistic (2.88) and P-value (0.04) showed that cocoa export price was significant at 5% level.

Table 2: Estimated Regression of Trend of Cocoa Export Price

Variable	Coefficient	Standard Error	t-Statistic	Probability
EXPRICE(-1)	-0.190272	0.136806	-1.390813	0.1726
D(EXPRICE(-1))	-0.272652	0.166810	-1.634501	0.1106
C	254.4720	318.8299	0.798143	0.4299
R^2= 0.19	**Adj.R^2=0.12**	**F-stat= 2.88**	**P =0.04**	

Source: Extracted from Results Provided by E-view Econometric software
** Significant at 1%, *Significant at 5% level

Table 3: Estimated Regression of Trend of Foreign Exchange Rate

Variable	Coefficient	Standard Error	t-Statistic	Probability
FXR(-1)	0.013283	0.031674	0.419356	0.6772
C	3.160152	2.400932	1.316219	0.1956
R^2= 0.00	**Adj.R^2=-0.02**	**F-stat= 0.17**	**P =0.68**	

Source: Extracted from Results Provided by E-view Econometric software

Table 3 shows the regression estimates of foreign exchange rate over the period under study. The R^2 value of 0.02 (2%) means that 2% of the variation in foreign exchange rate over the period studied could be explained by variation in time. The t value of 0.419

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explains FXR (2%) is positive and statistically not significant. This indicates that change in the foreign exchange rate over the period (1971-2013) cannot be explained by the 2% variation in time. The F-statistic (0.17) and P-value (0.68) clearly indicates that foreign exchange rate was not significant at 5% level.

Table 4 shows the summary results of the first difference statistics and augmented Dickey-Fuller (ADF) tests for order of integration of our variables.

Test for Co-integration

Having established that variables are non-stationary at level and stationary at first difference, a co-integration test among the variables was carried out. The co-integration test establishes whether there is a short and long-run relationship among these variables in the cocoa export. The Johansen maximum likelihood was used in the test. The result is given in Table 5

Table 4: ADF Unit Root Test Results and First Difference Statistics

Variables	Level	First difference	OI	R^2	Adj R^2	F-stat
LCE	-1.864366	-7.250507*	1(1)	0.88	086	45.04
LEP	-1.390813	-9.179336*	1(1)	0.69	0.67	42.13
LDP	-0.834209	-4.290339*	1(1)	0.35	0.29	6.44
LER	-1.744124	-6.138201*	1(1)	0.50	0.47	18.85
LIR	-3.791788	-7.197837*	1(1)	0.71	0.68	28.85
LQC	-0.858617	-9.308205*	1(1)	0.70	0.68	43.37
LTO	-2.111386	-5.626312*	1(1)	0.47	0.44	16.55

Source: Extracted from Unit Root Results Provided by E-view Econometric software
Note: Mackinnon critical values for ADF at 5% is -2.9399. Where OI means Order of Integration

Table 5: Co-integration Test Results
Unrestricted Co-integration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
At most 1 *	0.758932	137.5902	95.75366	0.0000
At most 1 *	0.491720	79.26046	69.81889	0.0073
At most 2 *	0.400589	51.51484	47.85613	0.0218
At most 3 *	0.301699	30.53069	29.79707	0.0411
At most 4 *	0.224576	15.80737	15.49471	0.0449
At most 5 *	0.122958	5.379234	3.841466	0.0204

Source: Extracted from co-integration results provided by E-view Econometric software
* Denotes rejection of the hypothesis at 5% level.

The Johansen co-integration tests (Table 5) showed that the Trace statistic value connotes the existence of 1, co-integration for the lagged quantity of cocoa export; and lagged exchange rate respectively. At most 2 co-integration for Lagged Interest rate, At most 3 shows co-integration for Lagged domestic price of cocoa, 4 co-integration for Lagged output of cocoa production and At most 5 shows co-integration for Trade openness. All variables were significant at 5% level. Therefore, it can be deduced from the results shown above that there exists a reliable long-run relationship between the specified exogenous variables in ascertaining the response of cocoa export.

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It is important to note that though not explicitly reported, Lagged Domestic price, Lagged Interest Rate, Lagged Quantity of Cocoa Produced and Lagged Trade openness were found to be stationary at first level differencing as revealed by their level graph and ADF statistics and results showed that they were all co-integrated.

Vector Error Correction Model

The Vector Error Correction Model was used to determine the short-run relationship between the variables and the speed of adjustment of these variables to long-run equilibrium.

Generally, the coefficients are expected to be negative and significant at 1% which indicates that a short-term adjustment between the explanatory variable will amount to a stable long-run adjustment of the dependent variable to equilibrium (Gujarati, 2004; Kingu, 2014).

Table 6 shows the long-run Vector Error Correction Model (VECM) of cocoa export to selected policy variables in Nigeria.

Table 6: Long Run VECM Estimates for Cocoa Export Response to Selected Policy Variables

Variables	Coefficient	Standard Error	t-Statistics
LCE	1.000000	-	-
LEP	0.138848	0.26401	0.52592
LDP	-0.203943	0.25736	-0.79245
LER	0.289336	0.25320	1.14269
LIR	0.328709*	0.04019	8.17906
LCO	-0.879499*	0.19667	-4.47203
LTO	0.046530	0.02590	1.79660

Source: Extracted from Vector Error Correction Estimates results provided by
E-view Econometric software,
* Denotes rejection of the hypothesis at 1% level respectively.

As expected, a negative and significant coefficient shows the dynamic adjustment of these variables in the long-run. From Table 6, it is observed that 1% increase in the quantity of cocoa produced led to an increase in the quantity of cocoa exported by 0.88%. This implies that the export of cocoa responds to an increase in cocoa production by the speed of 88% per annum in the long-run. This is in line with the finding of Kingu (2014) that increasing agricultural output by one percent increased cotton lint export earnings by 55% in his study of the determinants of Tanzanian export of cotton lint.

A 1% increase in interest rate will amount to 0.328% decrease in the export response of cocoa. Though the coefficient was positive, it was statistically significant at 1% level. Trade Openness also showed a positive value of 0.047% which explains a decrease in the quantity of cocoa export upon a 1% increase in Trade openness. It goes further to explain that more the trading platform and environment is open, the more economic agents and export intermediary activities are increased and this will influence the export of cocoa in the long-run.

Table 7 shows the short-run VECM estimates of cocoa export response to the selected policy variables. It revealed that exchange rate and export price were not significant

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determinants of cocoa exports as both variables were not significant at both the long-(0.289336 and 0.138848) and short-run (0.056190 and -0.064375) co-integration equations. The speed of adjustment was -0.407. It confirms that there was disequilibrium in the short-run equation. It also shows that there was a high speed of convergence to long-run relationship (equilibrium) amongst the variables. Furthermore the speed of adjustment as revealed from this study showed that the quantity of cocoa exported has to reduce by 40.7% to adjust from short-run disequilibrium to long-run equilibrium per annum. In other words, local domestic production of cocoa adjusts to equilibrium at a speed of 41% per annum and according to Kingu (2014), it connotes a high speed of convergence or adjustment to long-relationship (equilibrium run) amongst the variables.

Table 7: Short Run VECM estimates for Cocoa Export Response to Selected Policy Variables

Variables	Coefficient	Standard Error	t-Statistics
CointEq1	-0.406617**	0.18120	-2.24396
LCE	-0.334700**	0.15563	2.15064
LEP	-0.064375	0.14499	-0.44400
LDP	0.368510**	0.17507	2.10491
LER	0.056190	0.15388	0.36515
LIR	0.007077	0.06109	0.11585
LQC	-0.179014	0.24182	-0.74029
LTO	-0.016184	0.08138	-0.19886
C	-0.063625	0.04783	-1.33025

Source: Extracted from Vector Error Correction Estimates results provided by
E-view Econometric software**,**
** Denotes rejection of the hypothesis at 5% level.

The VECM results also revealed that only the coefficient of the domestic price of cocoa (0.368510) and lagged cocoa export quantity (0.334700) were significant at 5% significant level while other variables were not significant. This implies that the response of cocoa export in the short-run was being adjusted annually to equilibrium by the tinkering of domestic price of cocoa.

Export Response of Cocoa to Selected Policy Variables

Table 8 above identified variables that influence the amount of cocoa export over the period being studied both in the long and short run with their respective regression statistics.

Table 8: Export Response of Cocoa to Selected Policy Variables.

Variables	Export Response	AdjR^2	F-Stat	ECM(-1)
LCE	√	0.34	3.57	-0.41
LEP		0.53	6.69	0.21
LDP	√	0.12	1.70	-0.16
LER		0.41	4.45	-0.94
LIR	√	0.34	3.57	-1.70
LQC	√	0.23	2.51	0.07
LTO		-0.13	0.42	-0.36

Source: Survey Data, 2015

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It is observed that in the short run analysis, only local price of cocoa influences it export with a coefficient of determinant of 0.53 and F-stat of 6.69. Interest rate and Quantity of cocoa export were both significant in the long run with an adjusted R-squared of 0.34 and 0.23 and F-statistics 3.57 and 2.51 respectively. This suggests that when government and its regulatory export agencies are tinkering with export policy variables, considerations should be made on the effect of domestic price in the short term and influence of interest rate and local cocoa production in the long term framework so as to achieve her objective as agro- export promoting nation.

Conclusion and Recommendation

This study examined empirically Nigeria's cocoa export response to selected macro-economic variables from 1971 to 2013. The volume of Nigeria's cocoa exports is increasing but not dramatically and that increases in the independent variables appear to be more marked Cocoa export elasticity to these independent variables were all less than unity and negative in some cases and these variables did not have significant impacts on the volume of cocoa export if they are the only policy variables intended to be used to manipulate the export of cocoa. Therefore, effective policy formulation for Nigeria's cocoa exports should be geared towards identifying other macro-economic variables that affect cocoa export other than the ones captured in this study. Success in this will expedite rapid export growth in Nigeria's cocoa exports. In addition, factors such as price, exchange rate such as were included in this study should be properly monitored and manipulated to ensure it being favourable to the export.

Given that the elasticity response of cocoa exports to these policy variables are all less than unity, it is necessary that the Federal Government through the Nigerian Export Promotion Council (NEPC) look beyond these variables in formulating policies to promote the volume of cocoa traded in the export market.

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