Analysis of Some Drivers of Cocoa Export in Nigeria in the Era of Trade Liberalization

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Anotace

Příspěvek analyzuje některé determinanty vývozu kakaa z Nigérie v prostředí volného obchodu. Na základě výsledků kointegrací při využití Johansenovy kointegrace a OLS regresních metod je v případě Nigérie prokázán dlouhodobý rovnovážný vztah vývozu kakaa a vysvětlujících proměnných, jakými jsou množství produkce kakaa, domácí spotřeba a cena na světovém trhu. Navíc výsledky OLS potvrzují pozitivní vztah mezi vývozem a světovou cenou kakaa, otevřeností obchodu, REER a objemem světového exportu kakaa (statisticky významné na úrovních 0,01 a 0,05). Výsledky však potvrzují inverzní vztah mezi vývozem kakaa a domácí spotřebou (statisticky významné na úrovni 0,01). Z celkových hodnocení vyplývá, že Nigérie má z hlediska vývozu kakaa komparativní výhodu. Proto by Nigerijská vláda a partneři měli vytvořit příznivé podnikatelské prostředí včetně pobídek a dotací motivujících výrobce kakaa a obchodníky, a poskytovat jim cenově dostupné půjčky, které jim umožní zabezpečit udržitelnou produkci kakaa i jeho vývoz.

Klíčová slova

Export kakaa, kointegrace, liberalizace obchodu, světová cena.

Abstract

This contribution analysis some determinants of cocoa export in Nigeria in the era of free trade. Using Johansen cointegration and OLS regression methods, the cointegration results show there exists a long-run equilibrium relationship between cocoa exports and the explanatory variables such as quantity of cocoa production, domestic consumption and the world price in Nigeria. More so, the OLS results provide a positive relationship between cocoa export and world price, trade openness, REER, and quantity of world cocoa export (statistically significant at the 0.01 and 0.05 levels). However, the results show an inverse association between cocoa export and domestic cocoa consumption (statistically significant at 0.01 level). The findings indicate that Nigeria has a comparative advantage in cocoa export. The Nigerian government and partners should create an enabling environment and some incentives to stimulate cocoa producers and traders by subsidizing farm inputs, and providing affordable loans to them to ensure sustainable cocoa production and export in the country.

Key words

Cocoa export, cointegration, trade liberalization, world price.

Introduction

The integration and expansion of world trade through the reduction of trade barriers such as import tariffs, quotas and foreign investment rules are among the significant elements of free trade. The trend of international trade has remarkably risen since the creation of World Trade Organization (WTO) as a body for trade negotiations, policies and rules.

Trade liberalization has been one among the key forces that are driving globalization in recent decades. There is no doubt to say that, both developed and developing countries have seen the export of agricultural commodities like cocoa as a vehicle for transforming agricultural development and improving the livelihood of farmers/producers and national development. However, partly due to unfavourable trade rules and the neglect of the agriculture sector of the economy, trade has not yielded the anticipated results as poverty, and hunger persists in many Sub-Saharan African countries like Nigeria.

Prior to the discovery and extraction of crude oil in Nigeria, especially before the oil boom in the 1970s, the country was solely dependent on the agriculture, especially cocoa crop as the main source of foreign earnings. Even though, agricultural exports have experienced severe neglect as crude oil presently accounts for over 90% of the Nigeria's export products; cocoa is still the largest crop export and the principal export products after oil and gas.

Historically, Nigerian cocoa products were marketed through monopoly by the Nigerian marketing board (NCB), under the direct control of the government (Cadoni, 2013). To foster trade liberalization in African countries, the World Bank (WB) and the International Monetary Fund (IMF) introduced a program, called Structural Adjustment Programme (SAP) between 1980 and 1990. The banks stressed that agricultural marketing boards in countries like Nigeria and Ghana were ineffective, and they suggested in liberalizing agriculture following to the liberalization of foreign exchange or free market pricing policies. Consequently, the government of Nigeria was the first West African country to scrap its board (abolished marketing boards in the country) in 1986, and liberalized cocoa trade in the same year (Gilbert, 2009).

Through SAP, Nigeria was expected to implement certain policy reforms as a condition for receiving financial assistance from these world's financial institutions. The policy conditions included among others: trade liberalization; privatization of state corporations; and currency devaluation. The cogent objectives for liberalization in cocoa products were to accelerate competition in the marketing chain and export, to hand off states and donors from the burden of marketing cocoa products while at the same time obtaining a higher share of the world prices for cocoa producers. They argued that, markets are more efficient and competitive than the State in resource allocation and that the appropriate role of the government should be to provide a conducive environment and investment climate for the private sector to flourish.

During the SAP period in Nigeria, currency exchange control on all currency transactions were also abolished as soon as the era of liberalization began in 1986. They argued that floating exchange rate is better than fixed exchange rate. Thus, market forces should be allowed to determine the value of domestic currency against the basket of international currencies. Several studies

(Central Bank of Nigeria, 2008; Ogunleye, 2009; Umaru, Sa'idu and Musa, 2013) confirmed that real effective exchange rate (REER) is a driver of trade in products like cocoa in Nigeria especially after SAPs introduction. The Central Bank Nigeria (2008) found out that terms of trade (TOT), nominal effective exchange rate (NEER) and real exchange rate have effects on export trade in the country.

However, critics argued that these world's financial institutions also brought pains and undermined development in the developing countries more than the anticipated benefits. According to them, trade liberalization has exposed many aggro-allied industries in Nigeria into import competition from established global companies which led to the closure these firms. As a result, the country presently depends on finished products (i.e. foreign companies' process of cocoa beans to chocolate and powder) from developed countries for consumption as postulated by the dependency theory.

Some researchers have attempted to determine the drivers of cocoa exports in Nigeria and other countries. For instance, Boansi (2013) find a significant positive relationship between cocoa exports and production in Ghana. Arguably, increases in exports of cocoa beans could stimulate producers to double their efforts to increase production in the country.

Abolagba et al. (2010); Ndubuto et al. (2010) attempt to explore factors that seem to be affecting the export of cocoa from Nigeria. They found that Nigerian cocoa production positively associated with cocoa exports from the country to other parts of the world. They stressed that Nigeria has high comparative advantage in the exportation of cocoa products. Similarly, Amoro and Sheni (2013) examine the factors that appear to influence cocoa export in Cote D'Ivoire. Using OLS approach, they found a positive relationship between cocoa export and domestic cocoa outputs. Their results, however, showed an inverse connection between cocoa export and domestic consumption.

Yeboah, Shaik, Wozniak and Allen (2008) use gravity model to estimate the potential bilateral cocoa export commodities in the era of trade liberalization with 16 major cocoa producing nations to the United States of America (US). Using panel data spanning between 1989 and 2003, they found that differences between resource endowments, economic size of countries, and the sum of bilateral gross domestic product (GDP) of the U.S., as well as the exporting nations

were the main determinants of trade. They argued that, the producers' share of the world price might increase if trade is liberalized.

Nadeem (2007) investigate the dynamic effects of economic reforms and trade liberalization policy on the performance of agricultural export products in Pakistan. Using Johansen cointegration and vector error correction (VECM) methods, the results indicated that there exists a long-run equilibrium relationship between the real value of agricultural exports, competitiveness, openness and world demand for agricultural products in the country. The results also provided evidence that agricultural export development is more elastic to changes in national factors. Similarly, Daramola (2011) examined the export performance of cocoa and palm kernel in Nigeria. Using cointegration and error correction model (ECM), the results showed an association between cocoa export and quantity produced, producer price, world prices and real exchange rates in Nigeria. He also found a long run relationship between cocoa export and all the explanatory variables in the cointegration model. He stressed that the world price is a strong driver of cocoa export from the country, the world price of cocoa export is an incentive for farmers to increase production and export.

Akanni, Adeokun and Akintola (2004) determine the impacts of trade liberalization on the major agricultural products such as cocoa, palm kernel, groundnut and palm oil in Nigeria. They found out that free trade associated with these export commodities. They argued that, stakeholders should formulate policies that would stimulate investment in cocoa and other products to increase annual output, export and earnings.

Yusuf and Yusuf (2007) examine some drivers that determine the export performance of three principal agricultural products (cocoa, rubber and palm-kernel) in Nigeria in the era of liberalization. Using error correction model (ECM), the results showed that each of the three variables in the equation was cointegrated. Their results indicated that there exist both short run and long run equilibrium relationships between the dependent variables and their determinants. They called for the promotion of agricultural exports as an integral tool to reduce the burden of Nigeria's dependence on oil exports.

Darkwah and Verter (2014) analyze some determinants of cocoa production in Ghana for the period 1990-2011. Using Johansen cointegration and OLS regression approaches.

The cointegration test indicated a long run equilibrium relationship between cocoa bean production, the world price and cocoa export. Their OLS results showed a positive association between cocoa production and cocoa export. Conversely, the results revealed a negative relationship between cocoa production and world prices. They argued that, Ghanaian government had fixed the price of cocoa in order to protect producers from the price shocks on the international market. Consequently, farmers were likely to respond to the world price signals in the opposite directions.

Those studies did not include all the variables used in this study. More so, in view of the significance of cocoa as a principal crop export and a major source of foreign earnings from non-oil exports in Nigeria, it is imperative to determine cocoa export factors. Thus, the importance of this study. This article is an attempt empirically to verify some determinants (cocoa output, the world price, trade openness, real exchange rate) which appear to be driving cocoa exports in Nigeria for the past two decades.

This contribution is structured as follows: section 1 presents an introduction, and some empirical evidence related cocoa exports. Part 2 presents a theoretical framework, while part 3 presents the trend of cocoa production and export in Nigeria. Part 4 presents materials and methods, while part 5 presents empirical results and discussion. Finally, part 6 concludes the study.

Theoretical framework

Because cocoa production is based on the climatic condition, it could easily be linked to the international trade theories such as the comparative and absolute advantage models as well as the Heckscher – Ohlin trade theory (factor endowment theory) which explained why countries involve in trade.

The absolute advantage trade theory was coined by Adam Smith (1776) who is regarded as the father of modern economics. Smith defined absolute advantage as the process by which a country can produce a particular good at a lower cost than the other country. Therefore, a country that trade across national borders should specialize in producing goods that it has an absolute advantage over another. Smith maintained that; all countries would benefit if they practice free trade and specialize in what they could produce cheaply. Smith assumed that every country had an absolute advantage over another. What if a nation

has an absolute advantage in producing everything? Comparative advantage theory has answered this question.

The comparative advantage theory was propounded by David Ricardo (1817), who stressed that countries would mutually benefit from each other even if one has an absolute advantage over the other in producing of all the goods that they are trading. Ricardo postulated that the country should specialize in producing goods that it has the highest output relatively at the lowest cost in comparison with the other country. The theory was based on, among other assumptions; only two countries (e.g., Nigeria and Czech Republic) involve in the trade; trade only two products (e.g., cocoa and wheat); no trade barriers and there is a balance of trade.

Heckscher – Ohlin trade theory was coined by Eli Heckscher and Bertil Ohlin based on the theory of comparative advantage. The theory is also called 'factor endowment theory' because it stressed that the pattern of production and trade across the national borders would depend on the factor endowments. The theory maintained that the international trade takes place due to the differences in the comparative costs of factors of production that arise, due to the abundant or insufficient resources (cocoa) within countries. The theory argued that the country should produce and export products that it has cheap factor(s) of production and import products or inputs that are scarce locally (Blaug, 1992). Due to the favourable tropical climatic condition which a significant endowment factor for cocoa farming, Nigeria has taken the advantage and concentrated on producing and exporting cocoa products to parts of the world.

Paul Robin Krugman (1984) provides the first theoretical explanation of the role of agriculture in national development and its effects on export product. The theory argued that the expansion of agricultural export could lead to a significant increase in the demand for the nations' outputs, which in turn might lead to increase of real output.

The exchange rate is an important in cross-border trade. Difficulties that arise in the measurement of the real effective exchange rate (REER) in countries like Nigeria may hamper international trade because most countries would like to manipulate their exchange rates all in a bid to make their products appear more globally competitive. According Catão (2007), establishing whether a currency is undervalued or overvalued

has always been problematic, just as changes in terms of trade and differences in macroeconomic policies may constitute dire consequences to trade liberalization.

Cocoa production and export from Nigeria

Statistical data available from FAO (2013) as presented in figure 1 shows the trend of annual cocoa production and export in the world (measured in tonnes) and the share Nigeria cocoa production and export as a percentage of world cocoa production and export for the period 1981-2011. As shown in figure 1, within three decades, annual cocoa bean output in the world has drastically increased from 1.7 million tonnes in 1981 to 4.7 million tonnes in 2011. In the same direction, the annual world cocoa export has also increased from 1.1 million metric tonnes to 3.2 million metric tonnes within the period between 1981 and 2011, making an average of 4.6% annual export growth rate. This increment could partly attribute to trade liberalization in cocoa commodities. Despite the fact that trade barriers still exist in primary agricultural products, cocoa crop is liberalized as the major processors are western companies.

Nigeria is the fourth largest cocoa producer in the world after Ivory Coast, Indonesia and Ghana, and the third largest exporter of the cocoa crop after Ivory Coast and Ghana. It implies that, Nigeria is a major supplier or competitor of the cocoa crop in the world. This is partly because of the favourable tropical climatic conditions in the country and other top producing countries.

Despite the fact that, many raw agricultural commodities from the developing countries faced trade restrictions, data available indicated there is trade liberalization in raw cocoa bean products. Figure 2 shows that Nigeria recorded over 55% average annual cocoa export as a percentage of domestic cocoa bean output between the period 1987 and 2011. On a yearly basis, the country reported the highest of cocoa export as a percentage of production with 87.3% in 1999 and lowest with 35% in 1998. The major cocoa export destinations are Western Europe and North America where cocoa processing industries are located. However, as shown in figure 1, Nigeria's cocoa (cocoa, beans) export as a percentage of world export has fluctuated and decreased from 12.6% in 1981 to 8.5% in 2011. This partly because other countries are exporting the product more than Nigeria. More so, cocoa export was neglected by the Nigeria government as the country concentrated more on crude oil export than non-oil products like cocoa.
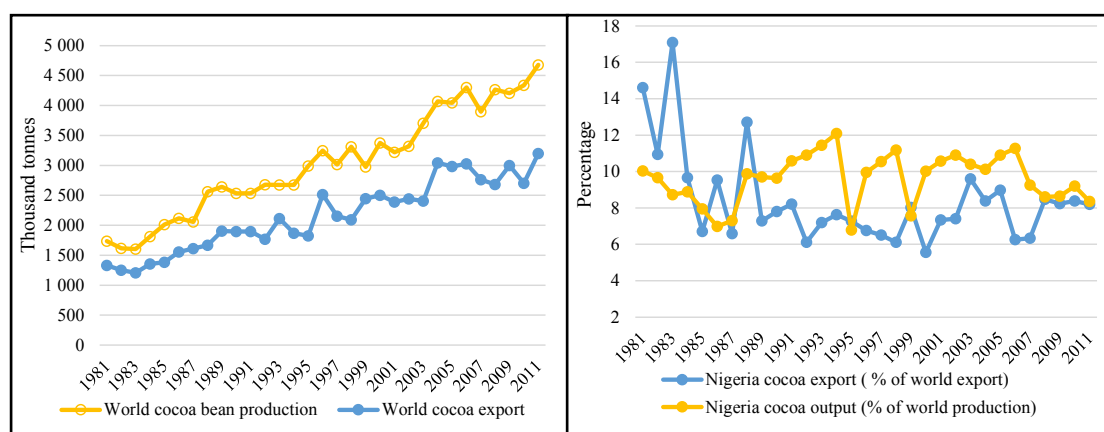
Source: Authors' analysis based on FAOSTAT, 2013

Figure 1: World cocoa bean production and export ('000 t) and percentages in Nigeria, 1981-2011.
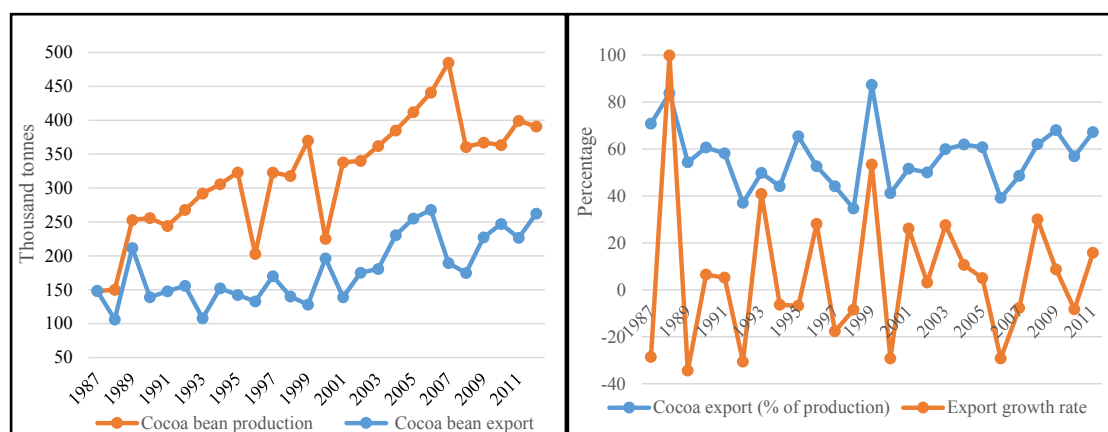
Source: Authors' analysis based on FAOSTAT, 2013

Figure 2: Cocoa production and export ('000 t) and export (% of production) in Nigeria, 1987-2011.

Cocoa is the largest agricultural export commodity in Nigeria. Figure 2 shows a fluctuating quantity of cocoa production and export in the country between 1987 and 2011. Cocoa production in the country has increased from 150 thousand tonnes in 1987 to 391 thousand tonnes in 2011. Nigeria cocoa export even though slightly fluctuated, it has steadily increased from 106 thousand tonnes to 262 thousand tonnes between 1987 and 2011. The fluctuation of the quantity of cocoa export from Nigeria could be attributed to the world price, exchange rate, domestic production and supply for export, neglect of cocoa related activities, etc. For instance, both cocoa domestic and world price over the years were far from consistent.

Historically, as compared to large scale grains like wheat and corn, world cocoa prices have been less prone to severe price shocks. Arguably,

this may *"be due to the difference in scale of global production and consumption, as well as differing degrees of speculative investment;"* thus, it is likely to exacerbate volatility in the primary commodity prices (World Cocoa Foundation, 2014, p. 9). Reflecting, inter alia, changes in global cocoa prices, partly due to the variations in the global value relative to the national currency, and a particular national market structure and conditions, competition, and quality. Although world market prices have increased over the years, real farm gate prices in several producing countries did not reflect this upward trend. The difference between world cocoa *"prices and producer prices in countries could be attributed to the aforementioned factors that affected producer price fluctuations"* (International Cocoa Organization, 2012, p. 8).

Materials and methods

Data sources

This study used mainly secondary data such as books, article journals and annual statistical data from various institutions. For the empirical analysis, annual time series data between 1990 and 2011 were obtained from various reliable sources such as the Food and Agriculture Organization (FAO) of the United Nations, United Nations Conference for Trade and Development (UNCTAD) database, and the International Monetary Fund (IMF) world economic outlook database.

Model specification

The model specified the annual quantity of cocoa export (tonnes) as a dependent variable, which is being explained by the quantity of cocoa output (tonnes), domestic consumption (tonnes), the world price (US$), quantity of world cocoa export (tonnes), trade openness, and real effective exchange rate.

The multiple regression model is specified here below:

$$QCEX = f\ (QCP,\ DCON,\ WP,\ QWCEX,\ TOPEN,\ REER) \qquad (1)$$

Thus, the econometric model 1 is mathematically specified as follow:

$$\ln QCEX_t = \beta_0 + \beta_1 \ln QCP_t + \beta_2 \ln DCON_t + \beta_3 \ln WP_t$$
$$+ \beta_4 \ln QWCEX_t + \beta_5 \ln TOPEN_t + \beta_6 \ln REER_t + \varepsilon_t \quad (2)$$

where;

$\ln QCEX_t$ is the natural log of annual quantity of cocoa export (tonnes), $\ln QCP_t$ is the natural log for the quantity of cocoa production (tonnes), $\ln DCON_t$ is the natural log of domestic consumption of cocoa products (tonnes), $\ln WP_t$ is the natural log for the world price of cocoa beans (US$), $\ln QWCEX_t$ is the natural log for aggregate of world cocoa export (tonnes) proxied for competitiveness, $\ln TOPEN_t$ is the natural log of trade openness index ((Exports+ Imports)/Nominal GDP)*100), is an indicator of trade liberalization, $\ln REER_t$ is the natural log of real effective exchange rate measured for the value of domestic currency as against foreign currencies, is the error term, β_0 represents constant, while β_1, β_2, β_3, β_4, β_5, and β_6 are coefficients of each variable in the model.

These variables in the model are selected because they appear to be the major drivers of cocoa export in Nigeria in recent years. For instance, it is assumed that the more the quantity of the cocoa bean is produced the more it would be available for export. High rate of cocoa consumption in Nigeria might reduce export, an increase of the cocoa price on the world market may induce traders to increase its export. Due to lack of time series data, some variables that are also likely to have an impact on the cocoa export in Nigeria are not selected.

Stationarity test: Because, annual time series data is prone to spurious regression results when *x* and *y* series are non-stationary (random walk). A variable is said to be stationary (not random walk) when its mean and variance are constant over time. Time series data is the difference to produce other sets of observations such as the first-difference and the second-difference values. The order of integration using Augmented Dickey- Fuller (ADF) and Philips-Perron (PP) unit root tests (Muhamed, 2008) as presented in model 4.

X level	x_t
X 1st - differenced value	$x_t - x_{t-1}$
X 2nd – differenced value	$x_t - x_{1-2}$ (4)

Cointegration test: Cointegration approaches are used to determine if there exists a valid long-run relationship between two or more variables in the model. For the result to be valid, two conditions must be satisfied: the data series for each variable involved ought to be integrated into the same order, and, there must exist a stationary linear combination. Several studies (Hendry, 1986; Johansen, 1988), have suggested a number of cointegration methods.

In order to determine the number of Cointegration vectors, Johansen (1988) used two tests: trace and the maximum Eigenvalue tests. Trace statistic, tests the null hypothesis of no cointegrating vectors (*r = 0*) against the general alternative of one or more cointegrating vectors (*r > 0*), while maximal Eigenvalue statistics tests the null hypothesis of *r* cointegrating vector(s) present against the specific alternative of (*r + 1*) cointegrating vector(s) present. These test statistics are computed as:

$$LR_{trace}(r/n) = -T \sum_{i=r+1}^{n} \ln(1-\hat{\lambda}_i) \qquad (5)$$

$$LR_{max}(r/n+1) = -T \ln(1-\hat{\lambda}) \qquad (6)$$

Model 5 test for trace, whereas model 6 tests for maximal Eigenvalue statistics. Where $\hat{\lambda}$ is

the estimated values of the characteristic roots obtained, and *T* is the sample size or number of observations in the model.

Results and discussion

1. Unit root test

The order of integration using both ADF and PP unit root tests is shown in table 1. The test results show that only two variables (QCEX and QWCEX) fail to reject the null hypothesis of a unit root in levels, but become stationary after first difference. Given that all the variables in the model have become stationary, we proceed to run Johansen cointegration and ordinary least squares (OLS) regression models.

2. Johansen test for cointegration

The model selection for cointegration is usually computed using an information criterion method, known as lag-order selection criteria. We have chosen lags 1 and proceed to run the Johansen

cointegration test Based on the evidence provided by the information criterion,

Table 2 presents the results of both Johansen trace and maximal Eigenvalue tests for cointegration among the variables in the models. Both Maximal Eigenvalue and Trace tests indicate for the rejection of the null hypothesis of no cointegration vectors at the 5% significance level (statistic is greater than 0.05 critical value). An alternative hypothesis is accepted that there is a long run equilibrium relationship between the all the variables in the model. It implies that the all the variables are moving together in the long run.

When a cointegration is established, it can be viewed as an indirect test of long run causality. We, therefore, conclude that variables in the models are likely to be driving cocoa exports in Nigeria in the long run. When a cointegration is established, it is advisable to run Vector error correction model (VECM). However, we have opted to run ordinary least squares (OLS) regression analysis.

Variable		ADF Stat	Order of integration	PP Stat	Order of integration
lnQCEX	Level	**-2.116**	1(1)	-2.033	1(1)
	First diff	-7.436***	1(0)	-8.476***	1(0)
lnQCP	Level	-2.674	1(1)	-2.576	1(1)
	First diff	-8.166***	1(0)	-9.376***	1(0)
lnDCON	Level	**-3.970 *****	1(1)	-4.286***	1(1)
lnWP	Level	-0.698	1(1)	-0.845	1(1)
	First diff	-3.748**	1(0)	-3.711 **	1(0)
lnQWCEX	Level	-1.643	1(1)	-1.328	1(1)
	First diff	-7.218 ***	1(0)	-9.087 ***	1(0)
lnTOPEN	Level	-3.986 **	1(0)	-4.308 ***	1(0)
lnREER	Level	-1.284	1(1)	-1.268	1(1)
	First diff	-4.468	1(0)	-4.508 ***	1(0)

Note: McKinnon (1991) critical values are: -2.630 for 10%, -3.000 for 5% and -3.750 for 1% level
Source: Own work

Table 1: ADF and PP tests for unit root (constant term only).

Hypothesized No. of CE(s)	*Trace Test*		*Maximum Eigenvalue test*	
	Statistic	0.05 critical value	Statistic	0.05 critical value
None	166.3418	124.24	52.4106	45.28
At most 1	113.9312	94.15	44.4741	39.37
At most 2	69.4571	68.52	30.2443	33.46
At most 3	39.2128	47.21	17.3006	27.07
At most 4	21.9122	29.68	13.9120	20.97
At most 5	8.0002	15.41	7.9723	14.07
At most 6	0.0279	3.76	0.0279	3.76

Source: Own work

Table 2: Johansen cointegration test results (constant only).

3. Diagnostic test for OLS regression model

Table 3 present results of diagnostic tests. The results of the tests seem to satisfy the prior econometric test as all the P. values of the diagnostic tests in table are greater than 0.05 level. More so, all the results of the tests show that the model is linear and correctly specified. It also shows that the variability of a variable has minimum variance, and they are not heteroskedasticity, and the error term is normally distributed. The variables used in the model are not autocorrelated. Given that all the classical assumptions of the linear regression model were fulfilled, we have continued with the OLS estimation method. The OLS regression result is presented in table 4.

4. OLS regression model results

As shown in table 4, it appears that the estimated model is a "good fit" given that the Adjusted R-squared is about 73% is accounted for the variability in the dependent variable in the model. More so, the p. value and F. statistics

in the model indicated that all the variables in regression model jointly influence cocoa export from Nigeria (statistically significant at the 0.01 level).

Even though the quantity of cocoa production appears to have a positive connection with cocoa export in Nigeria, it is statistically insignificant (see table 4). The result also shows an inverse relationship between cocoa export and domestic consumption (DCON), statistically significant at 0.01 level. It thus means that, a 1% increase in domestic cocoa consumption may decrease cocoa export from Nigeria by 0.13%, holding other variables constant (see table 4). This result is in consonance with the works of Amoro and Sheni (2013) who also found a negative relationship between cocoa export and domestic consumption in Ivory Coast.

Nevertheless, the result indicates that the world price (WP) has a positive influence on cocoa export from Nigeria to other parts of the world

Test	Test- statistic	P. value
Non-linearity test (squares)	8.39385	0.210645
Ramsey's RESET	0.077797	0.92558
White's test for heteroskedasticity	14.44	0.273494
Breusch-Pagan test for heteroskedasticity	2.89066	0.82244
Test for normality of residual	2.29511	0.317412
Breusch-Godfrey test for first-order autocorrelation	3.74415	0.0734584
Test for ARCH of order 1	0.0403926	0.840715
Test for ARCH of order 2	1.1857	0.55275

Source: Own work

Table 3: Diagnostic test.

Dependent variable: lnQCEX				
Variables	**Coefficient**	**Std. Error**	*t-ratio*	*p-value*
const	-0.018032	0.0278387	-0.6477	0.52695
lnQCP	0.061907	0.10723	0.5773	0.57228
lnDCON	-0.129427	0.0423554	-3.0557	0.00801***
lnWP	0.378955	0.1515	2.5014	0.02444**
lnQWCEX	1.10249	0.258926	4.2579	0.00069***
lnTOPEN	0.698914	0.163789	4.2672	0.00067***
lnREER	0.544038	0.218398	2.491	0.02494**
R-squared	0.80822			
Adjusted R^2	0.7315			
F (6, 15)	10.53575			
P-value (F)	0.0001			

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

Source: own work

Table 4: OLS, using observations 1990-2011 (T = 22).

(statistically significant at the 0.05 level). It implies that, all things being equal, a 1% increase in the world price, cocoa export from Nigeria is likely to increase by 0.38%. This result is in consisted with the findings by Daramola (2011) who also found a positive relationship between cocoa export and the world price in Nigeria. Arguably, the world price is a strong driver of cocoa export in the country.

Similarly, the results provide a strong positive relationship between cocoa export and quantity of world cocoa export (QWCEX), statistically significant at 0.01 level. A 1% increase of aggregate world cocoa export is likely to induce Nigeria to export cocoa by 1.1%. Nigeria is the fourth largest cocoa producer in the world and the third largest exporter of the cocoa crop after Ivory Coast and Ghana. Due to the favourable tropical climatic conditions (factor endowment), Nigeria has a comparative advantage in cocoa production and export.

Table 4 also shows that trade openness index (TOPEN) has a positive influence on cocoa export from Nigeria (statistically significant at 0.01 level). Holding other variables constant, a 1% increase in the level of trade openness proxied for liberalization, Nigeria is likely to increase the quantity of cocoa export by 0.70%. Trade openness indicates the size of Nigeria in the international trade or the integration of the country into the global economy. It implies that as trade openness index increases, cocoa export may also increase in the country.

In the same direction, the result in table 4 also show that real effective exchange rate (REER) has positive influence cocoa export in Nigeria, statistically significant at 0.01 level. This implies that, holding other variables constant, a 1% increase in the real effective exchange rate might boost cocoa export from Nigeria to other parts of the world by 0.54%. This result is consistent with the empirical works of Daramola (2011) who also found a positive association between cocoa export and the real exchange rates in Nigeria. The country adopted floating exchange rate regime upon the introduction of SAP in 1986 as among the tools for liberalization. Arguably, this could drive cocoa export if the value domestic currency is stable as against the basket of international currencies.

Finally, we conclude that variables in the model such as the world price, domestic cocoa consumption and trade openness indicate to have influence on cocoa export from Nigeria to other parts of the world. Due to lack of comprehensive data, other variables that are likely to have an impact on cocoa export in the country were not incorporated in the model. Future research should incorporate other variables like domestic producer price, annual rainfall to determine their impact on cocoa bean export in the country.

Conclusion

The aim of this contribution was to analyze some drivers of cocoa export in Nigeria in the era of trade liberalization for the period 1990-2011, using Johansen cointegration and OLS regression methods. Johansen cointegration results show there exists a long-run equilibrium relationship between cocoa exports and the explanatory variables such quantity of cocoa production, domestic consumption, real effective exchange rate and the world price in the country.

More so, the OLS regression results provide evidence that the explanatory variables in the model are the key drivers of cocoa export in Nigeria. The findings show a positive relationship between cocoa export and world price, trade openness, real effective exchange rate, and quantity of world cocoa export in Nigeria production (statistically significant at the 0.01 and 0.05 levels). However, the results show an inverse association between cocoa export and domestic production (statistically significant at the 0.01 level). This implies that the more the cocoa domestic consumption the less the quantity of cocoa that is available for export.

The Nigerian government should create an enabling environment and some incentives by increasing cocoa farm gate prices, subsidizing farm inputs, and providing affordable loans to smallholder cocoa farmers and traders to ensure sustainable cocoa bean production and export in the country.

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