

## Determinants of Agricultural Exports

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**ABSTRACT** The study examined the factors that influence agricultural exports with specific reference to Cocoa and Rubber. Secondary data was used for this study. Ordinary Least Squares regression (OLS) was used in analyzing the relevant data. The OLS findings revealed that rubber export is influenced significantly ( $p < 0.05$ ) by domestic rubber production ( $b = 68124.857$ ), producer price ( $b = 10741.503$ ), exchange rate ( $b = -17078.957$ ), domestic consumption ( $b = -27094.147$ ) and interest rate ( $b = 14991.565$ ). For cocoa, the OLS shows that cocoa output ( $b = 0.847$ ), domestic consumption ( $b = -0.850$ ) and rainfall (44.074) significantly ( $p < 0.05$ ) influence cocoa export. It is recommended that there should be value addition in respect of the cocoa being exported.

### INTRODUCTION

Agriculture has been the most important single activity in the Nigeria economy, with about 70% of the total working population engaged in it. In spite of the predominance of the petroleum sub-sector in Nigeria's economic growth and development, agriculture remains a major source of economic resilience (Ojo and Akanji 1996). However, the oil boom in the early nineteen seventies caused a drastic fall in the percentage contribution of the agricultural sector to 35 percent of GDP in the early eighties. The nation used to produce about 15% of world cocoa and was second largest producer of the crop in the world in the 60s (Utomakili and Abolagba 1996). Today, the country is far behind the New World major producers such as Cote'd' Ivoire, Ghana and Indonesia. One of the most dramatic events in Nigeria over the past decade was the devaluation of the Nigerian Naira with the adoption of a Structural Adjustment Programme (SAP) in 1986. A cardinal objective of the SAP was the restructuring of the production base of the economy with a positive bias for the production of agricultural exports. The foreign exchange reforms that facilitated a cumulative depreciation of the effective exchange rate were expected to increase the domestic prices of agricultural exports and therefore boost domestic production (Adubi and Okunmadewa 1999). The present situation of the smallholder sector in Nigeria is unclear. To some extent farmers have gone back to their original holdings induced by the high prices for natural rubber prevailing in the country. Present estimates

of small-holder area of 100,000ha consist of old planting of seedling rubber and yields are therefore very low. These plantings have been considered to be in urgent need of rehabilitation since the 1970s. The same story can be said of cocoa (Alabi et al. 2004).

In Nigeria, agricultural exports have played a prominent role in economic development by providing the needed foreign exchange earnings for other capital development projects. From the initial trade in Palm oil, Nigeria's agricultural export has enlarged to include cocoa beans and palm kernel. Available statistics indicate that in 1960, agricultural export commodities contributed well over 75% of total annual merchandise exports (Ekpo and Egwaikhide 1994). Nigeria also ranked very high in the production and exportation of some major crops in the world in the 1940s and 1950s. For instance, Nigeria was the largest exporter of palm oil and palm kernel, ranked second to Ghana in cocoa and occupied a third position in groundnut. Olayide and Essang (1976) observed that Nigeria's export earnings from major agricultural crops contributed significantly to the Gross Domestic Product (GDP). Similarly, Ekpo and Egwaikhide (1994) observed a long-term relationship between agricultural exports and economic growth in Nigeria.

At present Nigeria has lost its role as one of the world's leading exporters of agricultural commodities. In addition, the country is currently suffering from a declining as well as fluctuating income from its heavy dependence on oil exports. With the present situation in the oil market, it has become necessary for the country to reconsider

its agricultural commodity export position. This study therefore aims to examine the factors that can influence the export of cocoa and rubber with the following specific objectives:

- i. estimate net trade balance in agricultural trade.
- ii. determine the possible factors influencing the rubber and cocoa export trade.
- iii. proffer some policy recommendations based on the findings of this investigation.

### METHODOLOGY

The data for this study were obtained from secondary sources. They include the following; Food and agricultural organization (FAO), reputable journals and the Internet; and supplemented with primary data as Collected by the Rubber Research Institute of Nigeria (RRIN) and Cocoa Research Institute of Nigeria (CRIN). Four (4) different policy regimes have been identified and categorized for this study. The pre-1970 period (1961-1969), pre-SAP period (1970-1985), SAP period (1986-1994) and the post-SAP period (1995-2005). The pre-1970 period witnessed a minimum direct government intervention in agricultural development. The pre-Structural Adjustment Programme (SAP) era witnessed an increasing migration of able-bodied youths from the rural to urban areas. The Structural Adjustment Programme period was the era SAP was introduced in Nigeria. The post- Structural Adjustment Programme era is a period that witnessed activities in the agricultural sector after the Structural Adjustment Programme.

Ordinary least squares (OLS) method was used to determine variables affecting export of cocoa and natural rubber. The function is stated as:

$$X_t = f(Q_t, P_t, W_t, N_t, D_t, R_t, Int)$$

- i.  $X_t$ = natural rubber\cocoa export quantity (tonnes) between 1970 and 2005
- ii.  $Q_t$ =quantity of natural rubber\cocoa output (tonnes) between 1970 and 2005
- iii.  $P_t$ =average producer price of natural rubber or cocoa (₦/tonne) between 1970 and 2005
- iv.  $W_t$ =average world market price of natural rubber\cocoa (₦/tonne) between 1970 and 2005
- v.  $N_t$ =exchange rate (Naira to 1 U.S. dollar) between 1970 and 2005
- vi.  $D_t$ =domestic consumption (tonnes) of cocoa and rubber between 1970 and 2005

- vii.  $R_t$ =average total rainfall in major producing states(mm\yr) between 1970 and 2005
- viii.  $Int$ =Interest rate (%) between 1970 and 2005

### RESULTS

#### Average Net Trade Balance during Different Policy Regimes in Nigeria

Table 1 shows the average net trade balance during the 4 different policy regimes. The average net trade balance for total agricultural products on value at base year price (1000 US \$) from 1970 to 2004 range from -178,149.11 to -764,819.73.

**Table 1: Average net trade balance during different policy regimes in Nigeria**

Period	Net trade balance ('000 US\$)
1961-1969 (pre-1970)	842,767.59
1970-1985 (pre-SAP)	-178,149.11
1986-1994 (SAP)	-265,614.67
1995-2004 (post-SAP)	-764,819.73

Source: Computed from FAO Database, 2005.

#### Determinants of Cocoa Export (OLS Regression)

The result of the OLS regression is presented in Table 2. Regression analysis was carried out using Linear function. Linear function was used as it fits the model based on having the highest number of significant variables affecting cocoa export and the highest adjusted  $R^2$  value. The adjusted  $R^2$  was 0.789, implying that the independent variables explain 78.90% of the total variation in cocoa export. The value was significant at 1% for cocoa production (mt) ( $b=0.847$ ) and domestic consumption (mt) ( $b=-0.850$ ). The F-value (18.634;  $P < 0.05$ ) is significant at 1%, implying that the model is significant.

#### Determinants of Rubber export (OLS Regression)

The result of the OLS method is presented in table 3. Semi log function best fit the model as it has the highest number of significant variables affecting rubber export and high-adjusted  $R^2$  value. The adjusted  $R^2$  was 0.838; Implied that the independent variables explain 83.80% of the total variation in the rubber export. The value

**Table 2: Ordinary least square estimates for cocoa export**

<i>Variable</i>	<i>Coefficients</i>	<i>T</i>	<i>Sig.</i>
Constant	- 32424.547	- 0.870	0.392
Cocoa output (mt)	0.847*	6.876	0.000
Producer price of cocoa (₦/mt)	0.175	0.639	0.529
World Price of cocoa (₦/MT)	- 1.253	- 0.341	0.736
Exchange Rate	- 76.819	- 0.343	0.735
Domestic consumption (mt)	- 0.850*	- 8.019	0.000
Interest rate (%)	- 418.779	- 0.634	0.532

*Source:* Computed from data

F = 18.634;

Adjusted R<sup>2</sup>=0.789

\*Significant at 1 percent

**Table 3: Ordinary least squares estimates for rubber export**

<i>Variable</i>	<i>B</i>	<i>T</i>	<i>Sig.</i>
Constant	-731123.324	- 1.721	0.094
Rubber Production (mt)	68124.857*	8.647	0.000
Price of Rubber (₦/mt)	10741.503*	2.745	0.009
World Price of Rubber (₦/mt)	1798.804	0.322	0.749
Exchange Rate	- 17078.957*	- 2.717	0.010
Domestic consumption(mt)	- 27094.147*	- 10.367	0.000
Interest rate (percent)*	14991.565*	4.578	0.000

*Source:* Computed from data

F value 30.085

Adjusted R<sup>2</sup> = 0.838

\*Significant at 1 percent.

was significant at 1% for rubber production (mt) (b=68124.857), producer price (₦/mt) (b=10741.503), exchange rate (b=-17078.957), domestic consumption (mt) (b=-27094.147) and interest rate (%) (b=14991.565). The F value (30.085; P<0.05) is significant at 1%, implying that the model was significant.

## DISCUSSION

The net trade balance value shows that agriculture remains a deficit trade balance. During the pre-1970 era, Nigeria was involved in the exports of its agricultural products notably cocoa, natural rubber and palm oil. This contributed immensely to foreign earnings for the country. The implication of net exports shows that agricultural exports can adequately finance agricultural imports. Generally, the net trade balance value shows that Nigeria remains a net importer with regards to agriculture. In summary, based on the results of table 1, in which net export values for the different policy regimes studied had negative values, it can be concluded that agricultural exports cannot finance agricultural imports.

The positive sign for the cocoa production

implies that an increase in production will lead to an increase in export. Conversely, a reduction in domestic consumption of cocoa will lead to an increase in the export of cocoa.

The appropriate sign on rubber production is positive; it implies that an increase in production will stimulate an increase in export. The producer's price was also significant and has a positive sign. This is in agreement with Okoruwa et al. (2003), who reported that an increase in producer's price of rubber will lead to an increase in export of rubber. The implication is that an increase in the producer's price of rubber to match world price will encourage maintenance of rubber farms and increased output. The official exchange rate was significant but has a negative sign. This finding is in agreement with Mesike (2005) who also reported a negative relationship between rubber export and exchange rate. This implies that the lower exchange rate that occurred during the devaluation of domestic currencies led to increased exports. Domestic consumption has a negative relationship with rubber export. This implies that a reduction in domestic consumption will lead to an increase in export supply and vice-versa.

## CONCLUSION

Nigeria earned substantial foreign exchange from cocoa and natural rubber exports. However, major fluctuations in the export earnings have raised concern about the country's future growth potentials and self-sustainability. This study has established the major or significant determinants of cocoa and natural rubber exports.

## RECOMMENDATIONS

The result of the study showed that output, domestic consumption, interest rate, producer price and exchange rate have key roles to play in the export of cocoa and natural rubber in Nigeria. In order to improve the export supply of the two cash crops, the following steps are necessary.

There is need for value addition to cocoa being exported. This will attract more revenue than raw cocoa. This will also stimulate local consumption. Conservation and rehabilitation programmes for rubber should be organized in areas where degradative processes are about to set in. Also, uncontrolled felling of rubber trees should be checked and farmers encouraged through appropriate pricing mechanisms, to replant the cleared and rehabilitate the old rubber plantations.

The Federal Government should ensure that there is only a small margin between the producer prices and world price of rubber, so that rubber farmers can benefit substantially from international trade.

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