

PERFORMANCE ANALYSIS OF COCOA MARKETERS IN ONDO STATE, NIGERIA

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Abstract

Cocoa is a means of foreign exchange earnings for some of the West African countries. Hence, it becomes necessary to apply a functional market analysis to cocoa markets at the primary production level. This paper determined profitability and its correlates among cocoa marketers in Ondo State, Nigeria. Using multi stage sampling technique, fifty merchants were selected. Socio-economic characteristics of respondents collected were analyzed using descriptive statistics such as frequency and percentages while Gross margin analysis was employed to determine the profitability of the enterprise in the study area. Gini coefficient was used to examine the market structure while Ordinary Least Square regression model was used to ascertain the influence of some factors on the profitability of respondents. The result showed that 92% of respondents were married, with high (80%) literacy level. Most of the marketers have been on the job for long with the mean being about 18 years. The analysis also revealed that 66% of these marketers were primary assemblers while only 34% were bulk merchants. The profitability and efficiency ratio for the enterprise were 0.032 and 1.032, respectively. Gini coefficient value of 0.680175 obtained in this study indicates a high level of inequality in income among the respondents. The result also revealed that determinants of profitability in the enterprise were volume of goods handled by a marketer as well as its involvement in exportation. Ownership of a truck and the cost of warehousing were inversely proportional to profitability. The study concludes that the participation of a marketer in exportation of cocoa influences the volume handled and the profitability.

Keywords: cocoa, profitability, market concentration, Gini coefficient

Introduction

Cocoa is a perennial tree crop produced in many tropical countries. Currently, the production is centered in the West African countries namely, Cote d'Ivoire, Cameroon, Ghana and Nigeria.

These West African countries and Indonesia, collectively accounted for 70.4% of world cocoa production, in 2007 (World Cocoa Foundation, 2010). Cocoa plays a significant role in most of these economies as a source of foreign exchange. There are 5 – 6 million cocoa farmers worldwide; with 40 – 50 million people depending upon cocoa for their livelihood. Smallholder farmers produce about 90% – 95% of all cocoa. The typical size of a smallholder farm is about three hectares, with a colossal proportion of the farms in the size group of 2 – 5 hectares (WCF, 2012). As at year 2009, the global market value of the annual cocoa crop was \$5.1 billion (US dollars); also in February 2010, the price of cocoa was \$3,325.60 per ton (USD) (WCF, 2010). Cocoa had been the primary agricultural stake of the Nigerian economy until 1970's when the crude oil was discovered in commercial quantity in the country. It has remained a valuable crop and major foreign exchange earner among other agricultural commodities exported by the country (Ajayi, and Oyejide, 1974; ICCO, 2001).

Apart from its contribution to the nation's economy, cocoa is a plant-based food. It contains carbohydrates, fats, proteins, natural minerals and some vitamins and a group of compounds which exhibit health benefits like several other plant foods such as tea, red wine, fruits, vegetables and nuts cocoa (Taubert *et al*, 2007).

Despite the numerous benefits derived from cocoa, its production and marketing in Nigeria have been facing challenges which include: low yield, inconsistent production patterns, incidence of pests and diseases attack, the use of simple farm tools, as well as inconsistent market prices. Oduwale (2004) identified aging cocoa farms as one of the factors responsible for the decline in cocoa production in south western Nigeria. He observed that about 60% of cocoa farms were established over 40 years ago. Before, the liberalization of cocoa trade, the marketing and distribution of cocoa produce in Nigeria were controlled by the government through the establishment of the marketing board. The government controls the price through the monopoly of both the internal and external marketing of the produce. Once the cocoa is bought from the farm, it becomes the property of the government. Government was so involved in the pricing because, (i) the price of cocoa was still

exogenously determined, (ii) Government earned good income from cocoa production and sales (both internally and externally), and (iii) because of fluctuation of cocoa prices in the world market, government maintains buffer with which it stabilizes price so as to maintain stable price thereby encouraging farmers to produce more. However, the emergence of Structural Adjustment Programme (SAP) in 1986 led to the deregulation of cocoa price, thus allowing the forces of demand and supply to determine the price of the produce. The Structural Adjustment Program touted as the antidote to poverty and market inefficiencies that have persisted in developing countries, led to the dissolution of government-run marketing boards in most cocoa producing countries (Gilbert, 1997). With the advent of trade fair trade concepts, liberalization of the marketing chain of cocoa has been widened and extended. The marketing channel between cocoa farmers and exporters encompasses at least two middlemen, the retailers and wholesalers. Retailers purchase from farmers and sell to wholesalers. The wholesalers' in turn resell to exporters. Hence, there is no direct government involvement in the internal and external marketing of the product as the prices are determined by the world cocoa market. However, the government is involved in administering and regulating the various aspects of the cocoa trade such as quality, supervision and taxation.

Since the prices of cocoa are now determined by market forces of demand and supply, the marketing intermediaries (exporters, middlemen and assemblers) took advantage of this. This, of course, had a direct impact on farmers' incomes and food security as low prices have crushed farmers' willingness to invest in fertilizer, pesticide and insecticide to boost and protect their crop. Consequently, cocoa marketing suffer from various setbacks such as ranging from shortage of supply and price fluctuation etc. Given this, there is the need for an efficient cocoa marketing system to establish an effective linkage between producers and marketer. The problem, therefore, relates to the application of the functional market analysis to the cocoa markets at the primary production level. Hence, the study aimed at determining the profitability and efficiency ratio for the enterprise as well as identifying factors influencing profitability among cocoa marketers in Ondo State.

Methodology

Study Area

This study was carried out in Ondo State. It lies between latitudes 5°45' and 7°52'N and longitudes 4°20' and 6°05'E. Its land area is about 15,500 square kilometers. Ondo State is bounded on the

east by Edo and Delta states, on the west by Ogun and Osun States, on the north by Ekiti and Kogi States and on the south by the Bight of Benin and the Atlantic Ocean. Ondo State has eighteen Local Government Areas (LGAs). The climate of Ondo State is of the Lowland Tropical Rain Forest type, with distinct wet and dry seasons. In the south, the monthly mean temperature is 27°C, with a monthly mean range of 2°C, while the mean relative humidity is over seventy five percent (75%). However, in the northern part of the state, the monthly mean temperature and its range are about 30°C and 6°C respectively. The monthly mean relative humidity is less than seventy percent. In the south, rain falls throughout the year, but the three months of November, December and January may be relatively dry. The mean annual total rainfall exceeds 2000 millimeters. However, in the north, there is marked dry season from November to March when little or no rain falls. The total annual rainfall in the north, therefore, drops considerably to about 1800 millimeters. An important aspect of the vegetation of the state is the prevalence of tree crops. The major tree crops grown include cocoa, kola, coffee, rubber, oil palms and citrus.

Sampling Technique

A multi-stage sampling technique was employed in the study. The first stage involves a purposive selection of five dominant cocoa producing LGAs in Ondo State. They are: Idanre, Ondo West, Odigbo, Owo, and Akure South. The second stage involves a random selection of ten marketers from each of the LGAs thus making a total of fifty marketers. Primary data were collected using a structured interview schedule.

Analytical models

Descriptive statistics such as frequency counts and percentages were used to analyze some socio-economic characteristics of the respondents. Gini coefficient was used to examine the market concentration for cocoa marketers and the gross margin analysis was employed to determine the profitability of cocoa marketers in the study area. Mathematically, the Gini coefficient was represented by equation (1) i.e.

$$G.C = 1 - \sum XY$$

Where,

G.C = Gini Coefficient value

X = the percentage of cocoa marketers

Y = the cumulative percentage of their sales.

The gross margin was represented by equation (2) i.e.

$$GM = GI - TVC$$

Where,

G.M = Gross margin

G.I = Gross Income

TVC = Total variable cost

To estimate the degree of influence of some selected variables on the profitability in cocoa marketing, a regression of the following general form was estimated as stated in equation (3):

$$Y = f(X_1, X_2, X_3, X_4, X_5, X_6, \mu_i)$$

Where Y = Profitability

X_1 = Purchase cost

X_2 = Transport cost

X_3 = years of formal education

X_4 = Export (yes = 1, otherwise = 0)

X_5 = Ownership of Vehicle (D = 1, if marketer owns a vehicle, D = 0, if otherwise)

X_6 = Cost of warehousing.

A regression analysis was employed and various functional forms were fitted i.e. linear, semi-log, double-log and exponential. The lead equation was selected based on the following criteria: F-statistics, t-ratio, adjusted R^2 and conformity with *a priori* expectation.

Results and Discussion

Socio-economic characteristics of the farmers

Data in Table 1 shows that the modal age group among cocoa marketers in the study area was between 40 and 49, 98% were males. About 92% were married while 80% of them were literate. Most of the cocoa marketers were highly experienced. The costs and returns for the enterprise were computed.

Table 1: Socioeconomic characteristics of respondents

Socioeconomic characteristics of respondents	Frequency	Percentage (%)	Relative Frequency (%)
Gender			
Male	49	98	98.00
Female	1	2	100.00
Total	50	100.00	
Age of respondents (years)			
30 – 39	15	30.00	30.00
40 – 49	17	34.00	64.00
50 – 59	12	24.00	88.00
Above 60	6	12.00	100.00
Total	50	100.00	
Marital Status			
Singles	4	8.00	8.00
Married	46	92.00	100.00
Widow	0	0.00	100.00
Widower	0	0.00	100.00
Total	50	100.00	
Educational level			
No formal education	10	20.00	20.00
Primary school	4	8.00	28.00
Secondary school	21	42.00	70.00
Tertiary institution	15	30.00	100.00
Total	50	100.00	

Market Experience (years)			
< 10	9	18.00	18.00
11 – 19	21	42.00	60.00
20 – 29	12	24.00	84.00
30 – 39	6	12.00	96.00
40 & above	2	4.00	100.00
Total	50	100.00	

Source: Field survey, 2011

Estimated Cost and Returns of the Enterprise

Data in Table 2 presents the expenses incurred in cocoa enterprise on the average and per ton on a monthly basis. The mean sales volume was 209.16 ton. The average selling price was ₦334,600 per ton, while the gross revenue was ₦69,984,936.00. The average total variable cost (TVC) and gross margin estimated per marketer were ₦67,850,718.00 and ₦2,134,218.00 respectively. Since the difference between the gross revenue and gross margin is positive in the enterprise, it could be said that cocoa marketing is profitable in the study area.

Market Performance of the Enterprise

Efficiency and profitability ratio were used to examine cocoa marketing performance as specified below:

Efficiency ratio (ER) = Gross revenue ÷ Total cost

Profitability ratio (PR) = Gross margin ÷ Total cost

The market performance of the cocoa enterprise is presented in Table 3. Efficiency ratio (1.032) shows that for every ₦1.00 invested; the marketer realizes ₦1.03 while the profitability ratio (0.032) revealed that for every ₦1.00 invested, a gross margin of ₦0.03 is generated. The positive values of profitability ratio of 0.032 and an efficiency ratio of 1.032 greater than unity are an indication that the marketing operations are efficient. Furthermore, the total marketing margin was 14.78% and farmers' share was 85.24%. The average marketing margin can be rated as low. The mean marketing margin of primary assemblers (5.04%) were lower than those of bulk merchants/exporters (9.74%). This could be attributed to the handling costs incurred among bulk merchants/exporters which are less compared to primary assemblers. The average farmer's share of 85.24% was an indication that the proportion of the consumer price going to the farmer was favourable.

Table 2: Estimated cost and returns in the enterprise

Expenses Incurred	Cost per ton (₦)	Mean (₦)
Cost of purchase	314,200.00	65,718,072.00
Transportation cost	1,242.90	259,964.96
Labour cost	1,280.00	267,724.80
Storage cost	353.39	73,915.05
Jute bag	3,808.00	796,481.28
Taxes and levies	3,511.95	734,559.46
Total	324,396.24	67,850,718.00

Source: Field survey, 2011

Table 3: Statistical breakdown of Market Performance of the Enterprise

Variable	Value
Total Variable Cost	₦ 67,850,718.00
Gross Revenue	₦ 69,984,936.00
Gross Margin	₦ 2,134,218.00
Profitability ratio (π/TC)	0.032
Efficiency ratio (TR/TC)	1.032
Farmers' share	85.24%
Mean Marketing Margin of wholesalers	5.04%
Mean Marketing Margin of exporters	9.74%
Total Marketing Margin	14.78%

Source: Field survey, 2011

Table 4: Computation of Gini coefficient for Cocoa marketers in Ondo State, Nigeria

Income (sales)	Number of sellers (freq.)	Percentage of sellers	Cumulative Frequency	Cumulative percentage of sellers	Total sales (X)	Percentage of total sales (Y)	XY
< 30,000	11	22	11	22	148,860,000.00	4.26	0.009369
30,001 - 60,000	4	8	15	30	173,400,000.00	4.96	0.003968
60,001 - 90,000	25	50	40	80	1,940,500,000.00	55.51	0.277566
90,001 - 120,000	4	8	44	88	418,000,000.00	11.96	0.009566
120,001 - 150,000	5	10	49	98	642,000,000.00	18.37	0.018366
150,001 - 180,000	1	2	50	100	172,800,000.00	4.94	0.000989
Total	50				3,495,560,000.00	100	0.319825

Source: Field survey, 2011

Marketing Concentration among merchants

The Gini coefficient value of 0.680175 obtained from the mathematical computation of equation (1) implies a moderately high level of concentration in the market as presented in Table 4. The Gini coefficient of 68% reveals that few merchants had the capacity of effecting large purchases of cocoa in the study area. However, there exists healthy competition among merchants.

Result of Regression Model

Data in Table 5 shows the summary of the parameter estimates for the factors that affect the

profitability of cocoa. Based on the F-ratio, T-ratio, Adjusted R^2 and the number and signs of significant variables and conformity with *a priori* expectation, the double log functional form was chosen as the lead equation. The model has adjusted R^2 of 0.54 which indicated that 54% of variations in marketing margin of cocoa were jointly explained by the explanatory variables included in the model. The model has an F-value of 10.57 and was significant at 1% indicating that the model is fit.

The result of the regression analysis revealed that the coefficient of a volume of goods handled (X_1) was significant at 5% and positively related to the profitability meaning that as some products handled increases, the profitability also increases. This agrees with *a priori* expectation and Ali *et al.*

(2008), who reported a positive and significant relationship between purchase cost and selling price in fresh fish marketing in Maiduguri State, Nigeria. Thus, an increase in the volume of cocoa being handled by a merchant increases its selling price resulting in a greater profit.

Table 5: Double-Logarithm Regression Analysis

Variables	Regression Coefficients	Standard Error	T-ratio
Constants	- 22.108	10.487	- 2.108
X_1	2.037	0.824	2.473**
X_2	0.075	0.070	1.075
X_3	0.019	0.172	0.111
X_4	0.771	0.119	6.454*
X_5	- 0.297	0.102	- 2.925*
X_6	- 0.219	0.098	- 2.245**
Adjusted $R^2 = 0.54$			
F-statistics = 10.57			

Source: Field survey, 2011.

NOTE: *, **, *** means significant at 1%, 5%, and 10% respectively.

The involvement of a marketer in exporting cocoa produce was used in the analysis as a dummy variable. The coefficient of the variable export (X_4) was significant at 1% and positively related to the profitability indicating that export increases the cost effectiveness. This result is in conformity with *a priori* expectation and agrees with the findings of Nwaru and Iwuji (2005).

In the same vein, the quantity of produce that a marketer handles defines his scale of business operation. *Ceteris paribus*, the higher this scale, the higher the marketing cost as well as profitability because of a possibility of economies of scale. In other words, the involvement of a merchant in exportation influences the volume he handles leading to greater profitability.

In this study, it was observed that most of the respondents own a truck for the purpose of transporting cocoa from the farm to warehouses. This variable was used and analyzed as a dummy variable. The coefficient of the variable was significant at 1% but negatively related to profitability. This indicates that ownership of vehicle decreases the profitability of a marketer. This is contrary to *a priori* expectation and suggests that marketers who own vehicles had lower profitability due to high cost of maintenance of the vehicles.

Another variable of importance was the cost of warehousing cocoa produced by respondents. The coefficient of cost of warehouse was significant at 5%. This indicated that the cost of storage is inversely related to profitability, as the warehousing cost increases the profitability decreases.

Conclusion:

The paper examined the market performance among Ondo State cocoa marketers in Nigeria. The study revealed that the marketers are efficient and the enterprise was profitable with a high level of inequality in income among the respondents. The identified determinants of profitability among the marketers were volume of goods handled by a merchant and involvement in cocoa exporting.

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