Profitability and operational efficiencies of cocoa marketing in Abia State, Nigeria

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A R T I C L E I N F O	ABSTRACT

Key Words	The study assessed the profitability potentials of cocoa marketing in Abia State, Nigeria. A multi-stage sampling was adopted to select 80 cocoa farmers. Data was collected using a structured questionnaire. Descriptive statistics, marketing efficiency model and net farm revenue were employed in the data analysis. It was found that 69% of the respondents were men, 44% of the farmers (majority) were between ages 35 and 44 years. It was found that cocoa marketing is profitable as shown by the positive profit received. The marketers incurred an average variable and fixed cost of N 27,026 and ₦9,500 respectively. The marketers earned average total revenue of ₦53,862 per month, which indicates that an average marketer earned ₦17,336 as net income per month and realized 32 kobo in every ₦1.00 invested. The margin of 15.71% shows that cocoa marketing is profitable. The efficiency value of 1.474 suggests that cocoa marketing is efficient in the study area. Age, quantity sold and marketing experience were positively related to profit at 5 percent, 10 percent and 1 percent significant levels respectively while an increase in household size, distance to market, transportation costs and storage cost will reduce the level of profit of cocoa marketing. Shortage of capital, cost of marketing and storage facilities were the major constraints militating against cocoa marketing. It was concluded that cocoa marketing is profitable. We recommend that storage facilities and access to loans be provided to cocoa marketers not only as agricultural loans but as part of small and medium scale enterprises (SMEs) development grant, to expand their capacities.
Profitability,	
Operational Efficiencies	
Cocoa Marketing	
Marketing efficiency	
Value chain of cocoa	

1.0 Introduction

The Agriculture occupies a dominant position in the economy of Nigeria. The sector plays an important role in the provision of food, raw material for industries, employment for the majority and foreign exchange earnings. The country's major exports before the oil boom were mainly cash crops such as cocoa, groundnuts, cotton, gum arabic, rubber, ginger etc. (Odukoya, 2009). Cocoa production and marketing activities are essential for national macroeconomic balances and rural livelihood. According to Nkamleu *et al.,* (2010), cocoa production is dominated by four countries with Cote d'Ivoire and Ghana producing approximately 41 percent and 1 percent of the world output respectively while Cameroun and Nigeria each contributed approximately 5 percent of the world cocoa production. More so, the major markets for cocoa in the developed countries are United Kingdom, France, Germany, United States of America, Netherlands and Canada (International Cocoa Council, 2007). The contribution of cocoa to Nigerian economy cannot be over emphasized

owing to its contribution to the foreign exchange and economic development of the nation (Abang, 1984; Folayan *et al.,* 2006; Fadipe *et al.,* 2012). However, Folayan et al., (2006) opined that cocoa production declined after 1971 season, when its export decreased to 216,000 metric tons in 1976, and 150,000 metric tons in 1986, therefore reducing the country's market share to about 6th and 5th largest producer. Hence, the production of tree crops like cocoa and food crops such as cassava are being promoted through the presidential initiative to diversify the country's over dependence on oil. This has encouraged the production of cocoa and the participation of many people in cocoa marketing. Nkang *et al.,* (2007) reported that cocoa stakeholder's forum was held in Calabar, Nigeria to deliberate on the state of the cocoa sub sector and ways to boost cocoa production, domestic utilization and export. More so, efficient food marketing system according to Ladele *et al.,* (1997) helps to reduce post harvest losses, ensure adequate returns to farmers' investment and expansion in food production, thereby enhancing the level of food security in the country. Also, studies such as (Tura *et al.,* 2010; Bassey *et al.,* 2013; Oladapo *et al.,* 2007) lend credence to the importance of adequate marketing system. Therefore, given the rapidly increasing world demand for cocoa, it is necessary to carry out a study that will explore the potential and economics of cocoa marketing. For this study, the socio-economic characteristics of the marketers were examined. More so, the profitability of cocoa marketing in the study area as well as the determinants were analyzed and the constraints to cocoa marketing identified.

2. Research Methods

The study was conducted in Ikwuano L.G.A. of Abia State Nigeria. Ikwuano L.G.A. has a lad mass of about 60059km as well as population of about 61,214 according to the 2006 population census (National Population Commission, 2006).

The main occupation of Ikwuano people is farming. The soil of the L.G.A. is fertile though slightly acidic. The major food crops grown are cassava, yam, vegetable, maize etc while tree crops grown mainly are cocoa, rubber and oil palm. Various kinds of livestock and poultry are also raised by Ikwuano people.

The sample of the study comprised of all cocoa marketers in Ikwuano L.G.A. of Abia State. Two stage sampling procedures were adopted to select the sample size. The first stage was purposive sampling of 4 autonomous communities from the local government where cocoa producers were also the marketers. Also, two markets (Ndoro and Ariam) were also selected based on the concentration of cocoa marketers in the markets. The second stage involves the random selection of 10 marketers who were also the producers making a total of 40 marketers from the autonomous communities. In addition, 20 marketers were randomly selected from the two markets to give a total of 40 cocoa marketers. In all, the sample size was made up of eighty (80) respondents. The data for this study were obtained using a well-structured questionnaire from primary sources through oral interview and personal observation.

Method of Data Analysis

Simple description statistics like tables, frequencies and percentages as well as econometric tools were used in the data analysis. The socio-economic characteristics of the respondents and the constraints militating against cocoa marketing in the study area were analyzed using simple descriptive tools like tables and frequencies while the profitability of cocoa marketing was analyzed using the cost and return, gross margins and marketing efficiency indices. Multiple regression technique was used to analyze the profitability of cocoa marketing in the study area.

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Model specification
Marketing margin (mm) model is given as:

MM: Selling price - Purchase price   x 100

             Selling price   1

Marketing Efficiency (M.E.) model is given as:

M.E.   =   Net return   x   100

               Total marketing cost   ……..(1)

Costs and returns model is given as:

Profit ($\prod$)   =   TR - TC   ……(2)

Where,

TR   =   Total Return

TC   =   Total Cost

N/B: TC   =   TFC + TVC

Where,

TFC   =   Total Fixed Cost

TVC   =   Total Variable Cost

Multiple regression analysis
The model specified was subjected to four functional forms and the lead equation was selected based on the economic, econometric and statistical criteria. The four functional forms fitted were linear, semi-log, Cobb-Douglas and exponential. Explicitly, the four functional forms are shown thus:

Linear; $Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 +……. + b_9X_9 + \mu$ ………………(3)

Semi-log;

$Y = \log b_0 + b_1\log X_1 + b_2\log X_2 + b_3\log X_3 + b_4\log X_4 +…..+b_9\log X_9 + \mu$ ………(4)

Cobb-Douglas;

$\log Y = \log b_0 + b_1\log X_1 + b_2\log X_2 + b_3\log X_3 + b_4\log X_4 +…….+b_9\log X_9 + \mu$ …………..(5)

Exponential; $\log Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 +……….+b9X9 + \mu$ ……………...(6)

Where;

b_0 is the intercept

$b_1 – b_9$ are the coefficients to be examined and $X_1 – X_9$ are the explanatory variables defined in equations 3 to 6 above

The implicit form of the model is specified as follows:

$Y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, X_9 + \mu)$ ..(7)
Y= Profits (Net returns, ₦), X_1 = Age of marketers (Years), X_2 = Household size (number of people living with the marketer), X_3 = Level of education (years), X_4 = Distance to the nearest market (Km), X_5 = Transportation cost (₦), X_6 = Storage cost (₦), X_7 = Quantity of cocoa sold (kg), X_8 = Cooperative membership (1=member, 0= otherwise), X_9 = Marketing experience (Years), e = Error term.

Some variables were dropped due to the presence of multicollinearity which could have affected the result of the analysis.

3. Results and Discussion

Socio-economic Characteristics of Respondents

The socio-economic characteristics of the cocoa marketers are presented in Table 1. The features examined include sex, age, marital status, household size, level of education and cooperative membership. From the table 1, the information drew from the survey shows that 69% of the respondents are men. This indicates that more men participated in cocoa marketing than females. Since most of the marketers were cocoa farmers, the stress associated with cocoa farming would have been the reason for the result. About 44% of the respondents were between ages 35 and 44years, which formed the majority. This shows that these marketers are young and in their active years. Age relates to strength, innovativeness, activeness and efficiency and corroborates to Nwaru (2004). The marital status of the respondents as given by the table above shows that majority of the respondents accounting for about 92% were married and only 8% single.

The dominance of the married could indicate a large household and may be a source of labour

thereby reducing expenses on hired labour for the marketing operations. Marketers with secondary education accounted for the highest proportion of the entire respondents (63%). This implies that the marketers could read, write, make better resource allocation and efficiently too. The marketing experience distribution of the respondents shows that 56% of the marketers had experience between 6 and 10 years followed by 25% who had experience of between 11 and 15 years.

Table 1: Frequency Distribution of Respondents According to their Socio-economic Characteristics

Gender	Frequency[**]	Percentage
Male	55	69
Female	25	31
Total	**80**	**100**
Age Range (Years)		
25-34	15	19
35-44	35	44
45-54	20	25
55-64	10	12
Total	**80**	**100**
Marital Status		
Single	6	8
Married	74	92
Total	**80**	**100**
Level of Education		
No formal education	10	12
Primary education	12	15
Secondary education	50	63
Tertiary education	8	10
Total	**80**	**100**
Business Experience (Years)		
1-5	10	12
6-10	45	56
11-15	20	25
16-20	5	7
Total	**80**	**100**
Household size		
1-5	45	56
6-10	25	31
11-15	10	13
Total	**80**	**100**
Cooperative Membership		
Yes	41	51
No	39	49
Total	**80**	**100**

Source*: Field Survey, 2015*

The result indicates that the marketers were well experienced and as such were expected to understand the operations of the system and thus make good management decisions, which will enhance the efficiency of the marketing process. About 56% of the respondents had a household size of 1-5 family members, which is followed by 6-10 family members with the percentage of 31%. Household size has been known to affect labour supply, thus, labour was more available among larger households and expenses on hired labour consequently low and the reverse on the other hand. The distribution of the respondents by cooperative membership shows that 51% of the farmers are cooperative members while 49% are non-members. This implies that 51% of the farmers would have access to loans and innovative ideas while the remaining may not. This is because cooperative membership is a major requirement for receiving certain loans especially from agricultural banks**.**

Cost, Returns, and Performance (Marketing Efficiency and Marketing Margin) Analysis of the Cocoa Marketers.

In order to determine the profitability and performance status of the cocoa marketers, a cost and returns analysis as well as a performance analysis was carried out in this study. The result is presented in Table 2. According to the table, net returns for marketers indicate that cocoa marketing is profitable as shown by the positive profit received. The marketers incurred an average variable and fixed cost of ₦ 27,026 and ₦ 9,500 respectively. The profitability index/ratio for cocoa marketing is 0.3218. This means that for every ₦1.00 invested by the marketers, a return of 32kobo was realized. This conforms to the findings of Folayan *et al.,* (2007) which stated that cocoa trading is profitable.

Table 2: Cost and Returns and Performance Analysis of the Cocoa Marketers

Market variables	Unit	Value
Variable Cost items		
Average Cost of transportation	(₦)	9,153
Average cost of cocoa/bag	(₦)	15,173
Average cost of electricity	(₦)	2000
Average cost of other items (govt. charges etc.)	(₦)	700
Average Variable Cost (AVC)	(₦)	27,026
Fixed Cost items		
Machines/equipment	(₦)	5,000
Rent	(₦)	1,000
Furniture (tables/chairs)	(₦)	2,000
Basins/trays/scales	(₦)	1,500
Average Fixed Cost	(₦)	9,500
Total Cost	(₦)	36,526
Average Gross Returns from sales (Total Revenue, TR)	(₦)	53,862
Net Returns (NR)	(₦)	17,336
Gross Margin (GM)	(₦)	26,836
Profitability index	0.3218	

Source: *Field Survey, 2015*

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Table 3: Marketing Efficiency and Marketing Margin Analysis of the Cocoa Marketers

Selling price	₦	18,000
Purchase price	₦	15,173
Net Returns	₦	17,336
Total Marketing Cost	₦	36,526
Marketing Efficiency/Mark (M.E)		1.474
Marketing Margin (M.M)	(%)	15.71

Source: *Field Survey, 2015*

The result of the marketing efficiency analysis showed that cocoa marketing in the study area is operationally efficient for the traders. According to Scarborough and Kydd (1992), marketing efficiency ranges from zero (0) to infinity. 100% indicates perfectly efficient market, and less than 100% indicates market inefficiency and above 100% indicates excess profit. However, Folayan *et al.,* 2007) stated that efficiency ratio greater than one indicates an efficient cocoa marketing. Given this, the efficiency value of 1.474 as shown in Table 3 above suggests that cocoa marketing is efficient in the study area.

Factors Affecting the Profitability of Cocoa Marketers

To examine the factors affecting the profitability of the cocoa marketers in the study area, the multiple regression model was employed. Four (4) functional forms of the model were tested and the lead equation chosen based on a number of statistical, economic and econometric considerations such as number of significant variables conforming to *a priori* expectations, the R^2 value, F-ratio etc. Considering the above, the semi-log was chosen as the lead equation. The model R^2 showed that 74.6% of changes in profits from cocoa marketing were accounted for by changes in the explanatory variables included in the model and the remaining 25.4% due to error. The F-ratio was significant at 1% implying a good test of fit. he result is presented in Table 4 below. The coefficient of age of marketers was positive and significantly related to profit of marketers at the 5 percent levels. This showed that an increase

in age would increase profit of marketers possibly because age relates to experience, thus, the more aged marketing get, the more profitable they become. This finding contradicts such previous findings as Obasi *et al.* (2012) and Bassey *et al.* (2015) which hold that aged marketers are not innovative and lack the vigor and energy to withstand the rigor of marketing. Household size showed a negative relationship with cocoa marketing profit meaning that profits reduced as household size increased. The reason is that with a large household, more expenses are made in terms of feeding, shelter, healthcare, education and therefore reduce the profits available at the marketers' disposal having made other house expenses. Distance to the nearest market also had a negative influence on profitability at 10%. This implies that as distance increased, profitability decreased. This may be as a result of the high transportation cost experienced. Transportation cost also impacted negatively on the profit of marketers at the 10 percent significance level. Its coefficient (0.222) showed that increasing transportation cost would decrease cocoa profit by 2.22 percent.

This finding support those of Lele and Adu-Nyako (1991) and Madhin (1991) who reported that transportation cost accounted for a larger portion of marketing margin in Africa and Sub-Saharan Africa respectively. Bassey *et al.,* (2015) also agreed to this position. The coefficient of storage cost was negative and significant at the 1 percent level. This implied that increasing storage cost would reduce profit of cocoa marketers by

16.4 percent. This is in line with *a priori expectation*, because cocoa marketing require adequate storage to avoid spoilage.

Table 4. Regression result of Factors Affecting Cocoa Marketing Profitability

Variables	Linear	Exponential	Semi-Log (+)	Double-Log
Constant	0.234	0.361	0.146	0.738
	(-1.200)	(4.383)***	(-1.468)	(0.336)
X_1 (Marketers' age in years)	0.188	0.347	0.194	0.358
	(1.330)	(0.947)	(2.310)**	(0.925)
X_2 (Household size)	0.780	0.903	0.695	0.832
	(-0.281)	(2.122)*	(-2.394)**	(-2.213)*
X_3 (Educational qualification, yrs)	0.173	0.876	0.177	0.873
	(1.769)*	(0.156)	(0.632)	(0.160)
	0.536	0.635	0.756	0.423
X_4 (Distance to market, Km)	(-2.009)*	(-.453)	(-1.998)*	(1.002)
X_5 (Transportation cost, ₦)	0.142	0.937	0.222	0.872
	(-1.485)	(-1.797)*	(-1.831)*	(0.161)
X_6 (Storage cost, ₦)	0.154	0.428	0.164	0.459
	(1.542)*	(0.797)	(-2.907)***	(0.745)
X_7 (Quantity sold, Kg)	0.081	0.650	0.088	0.683
	(1.770)*	(2.456)**	(1.730)*	(2.092)*
X_8 (Cooperative membership)	0.002	0.342	0.452	0.984
	(1.342)	(1.324)	(0.922)	(1.552)
X_9 (Marketing experience, Years)	0.023	0.054	0.445	0.007
	(2.348)**	(2.012)*	(2.774)***	(2.326)**
R^2	0.553	0.533	0.746	0.435
Adj. R	0.473	0.366	0.546	0.372
F-Ratio	5.890***	5.602***	7.558***	2.503**

Source: Field Survey, 2015.

+ Lead equation

Since storage facilities are grossly inadequate in the study area, most marketers resort to smoking and home storage which is not only costly but damage prone, thereby increasing the marketing cost. Though this result agrees with Bassey *et al.,* (2015), it is at variance with (Obasi *et al.,*2012). Quantity sold was positively related to the profitability of cocoa marketing at the 10 percent level of significance. This shows that increasing the quantity of cocoa sold yielded more profit for the marketers in the study area. The coefficient for marketing experience was positive and significant at the 5 percent level. Experienced marketers are perceived to have learnt from the other marketer's experiences due to their prolonged fraternity with them. They have also accumulated enough marketing knowledge through several years of marketing trials and errors (Bassey *et al.,* 2013). This finding lends credence (Obasi *et al.,* 2012). The result of the problems militating against cocoa marketing in the study area showed that all the problems considered had responses on them. The result further showed that

lack of capital and funds was the major problem facing cocoa marketing in the study area. It has been

discovered that cost is the major hindrance faced by several business outlets. This had about 34% respondents agreeing to this.

Table 5. Constraints Militating Against Cocoa Marketing in the study area.

S/N	Problems	Frequency*	Percentage	Rank
1	Lack of capital/funds	27	34	1st
2	High cost of the commodity	18	22	2nd
3	Poor road networks	14	18	3rd
4	High cost of transportation	10	12	4th
5	Poor storage/processing facilities	8	10	5th
	Total	**80**	**100**	

Source: Field Survey, 2015.
*Multiple Responses

Other problems like cost of the commodity, poor road networks, high transportation cost and poor processing/storage facilities all were identified constraints.

4. Conclusion

Cocoa marketing can serve as one of the veritable venture to alleviate poverty in the study area since it is a profitable venture. Based on the profitability potentials of cocoa in the study area, it was therefore recommended that our unemployed youths and young school leavers should be encouraged through awareness campaigns to venture into cocoa marketing. Provision of credit support to cocoa marketers not only as agricultural loans but as part of small and medium scale enterprises (SMEs) development grant, to expand their capacities and income is recommended.

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