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Determinants of the Profitability of Palm Oil Marketing in Umuahia Agricultural Zone of Abia State, Nigeria

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Abstract

The study analyzed the determinants of the profitability of palm oil marketing in Umuahia Agricultural zone of Abia State. Multi stage sampling technique was employed to select 60 palm oil marketers. Primary data was collected with the aid of well-structured questionnaire. Data obtained were analyzed using descriptive statistical technique, marketing margin profitability models, and ordinary least squares multiple regression technique. Results of the descriptive statistical technique showed the mean age of the respondents to be 47 years with a household size of 5 persons. 77% of the palm oil marketers were males while only 23% were females indicating the dominance of the male folks. Mean marketing experience of the palm oil marketers was estimated to be 16 years. The gross and net marketing margins were estimated at ₦55, 288.91 and ₦54, 076.91 respectively. Marketing Margin was found to be ₦81,221.22 and profitability was estimated at 0.33. Age, household size, education and marketing experience were statistically significant at 5% and influenced the profitability of palm oil marketing in the area. However, considering the net profit from palm oil marketing, there is need to intensify its management principles to further harness more profitable outcomes in future engagements. Also enabling environment should be created to make production and marketing of the product less stressful, especially for women entrepreneurs.

Kewords: Determinants, Palm oil marketing, Profitability, Net returns, Multistage sampling, Regression analysis, Abia State.

Introduction

Palm oil is an edible vegetable oil derived from the *mesocarp* (reddish fruit) of the fruit of oil palms, primarily the African oil palm-*Elaeisguineensis*, and to a lesser extent from the American oil palm-*Elaeisoleifera* and the *paripa* palm-*Attaleameripe*. Palm oil is naturally reddish in colour because of high beta-carotene content (Tridge, 2020). It is the world`s largest source of edible oil and fat production (Mpoc, 2007). It is further seen as the world's second major vegetable oil, after soya bean oil with world annual production of fresh fruit bunches approaching 100 million metric tons per year (Stock- brokers, 2020). Ibekwe (2008) opined that palm oil is currently the second largest traded edible oil and accounts for about one quarter of the world`s fat and oil supply.Ideally, two kinds of oil are obtained from oil palm, the red palm oil extracted from the fibrous layers (*Mesocarp*) of the nuts, and the palm kernel oil which is obtained from the kernel. The former is the focus of this work. It is worthwhile to note that palm oil is not only used domestically (as edible oil) but also used in 50% of products, con- sumers' purchase and use on daily basis (Shahbandeh, 2020). Palm oil and its derivatives (fractions of the oil) are used in the manufacture of prepackaged food, cosmetics, cleaning products, hair care, soaps and other personal care items, for instance palm wax is used in the manufacture of candles, etc (NAN, 2019 and Mathew, 2007) and this account for high demands for the oil. Production is never regarded to be complete until the product gets to the final consumers, thus the essence of marketing. Palm oil marketing is concerned with all stages of operation that aid movement of the product from the producers to the consumers. These processes include assemblage, storage, and transportation, grad- ing and financing (Nwauwa, 2012). Marketing of palm oil in Nigeria takes place in

homes, roadsides, local/periodic market centers and stalls. These can be both wholesale and retail types in both urban and rural centers (Olagunju, 2008). The distribution and marketing of agricultural products are as essential as the production itself (FAO,2003). The nature of agricultural produce demands efficient marketing to avoid wastage or spoilage. Palm oil is no exception to this requirement. The fact that they are majorly produced in the rural areas where there are challenges of low infrastructures like good road net- works, storage and processing facilities pose a great concern for both production and marketing (Few- nets, 2020).Furthermore, poor communication channels, exploitative taxes, inadequacy of economic data for planning and research, high transportation cost, low provision of market information and quality control, bulky nature as well as high perishability tendency also constitutes a major constraint to palm oil marketing. Previous studies on oil palm marketing in Nigeria had equally aligned with the above assertion (Bussiness-Insider, 2020).Other problems include high level of intermediaries in the marketing / distribution chain. The wholesalers and retailers with their allies constitute 50% of players in the marketing activities in Abia State and dictate the prices of palm oil which is also influenced by wide demand and supply gap (Obasi, 2014). Most marketers' in order to make excessive gain (abnormal profit) engaged in the hoarding of palm oil to create artificial scarcity, thus they buy at a very cheap rate during the boom period (dry season) and hoard for resale during periods of shortage (rainy season) which usually results to price hikes. Considering this backdrop, empirical evaluation of marketing margin and the profitability of palm oil marketing in Umuahia Agricultural zone of Abia State is of essence to determine whether it is profitable or not and to ascertain the magnitude of the gains that could be obtained by improving the marketing system of palm oil in the area and thus increase profitability and improve the nation's gross domestic product (GDP).

Materials and Methods

This study was conducted in Abia State, which is located in the South Eastern part of Nigeria. The state lies between lattitude $4^{0}40^{1}$N and $6^{0}14^{1}$North and longitudes $7^{0}10^{1}$E and $8^{0}15^{1}$E of the equator. Abia has a total land area of 5,243.7km^{2}, approximately 5.8% land area of Nigeria. It has a total population of 2,833,999 (2006 census). The state shares boundaries with Ebonyi state to the North, Rivers State to the south, Cross river and Akwai bom States to the East and Imo State to the West. The state is made up of seventeen local government areas which are grouped into three Agricultural zones namely; Aba, Umuahia and Ohafia Agricultural zones. The state has a generally undulating terrain with tropical rain forest vegetation. It is noted for her vast agricultural activities and craft. Cash crops grown in the area include oil palm, raffia palm, cocoa, citrus (oranges), kola nuts, banana/plantain and pineapple while the food crops grown include cassava, yam, maize, rice, okra, cocoyam, cucumber and sweet potatoes.

Multi-stage sampling technique was used for this study. In the first stage, two local government areas Ikwuano and Umuahia south were randomly selected from the five local government areas that make up Umuahia agricultural zone. Umuahia Agricultural zone was purposively chosen because of the high concentration of palm oil marketers in the area. The second stage involved the random selection of three communities from each of the two selected local government areas making a total of six communities. The third stage again involved a random selection of two villages from each of these communities, amounting to a total number of 12 villages, and thus, 6 palm oil marketers (wholesalers) were picked from each of these villages giving a total sample of 72 palm oil marketers, but from the questionnaire collected, only 60 marketers were found useful for data analysis. The zonal Agricultural Development Program Coordinator's' (ADPC) provided the sample frame for this selection.

Data were analyzed using descriptive statistics (frequency and mean) marketing margin, profitability models, and ordinary least squares multiple regression techniques. The models are presented as follows,

Marketing margin model

Where,

MM = (SP-PP)/SPx100/1 (1)
MM=Marketing margin (in naira)
SP= Selling price (per liter of palm oil)(in naira)
PP = Purchase price (per liter of palm oil)(in naira)
Profitability models,
Profitability = NR/TC (2)
NR= TR-TC (3)
TR=P x Q (4)
TC=TFC+TVC (5)

Where,

NR=Net Revenue(in naira)
TR=Total Revenue(in naira)
TC= Total Cost(in naira)
TFC= Total Fixed Cost(in naira)
TVC=Total Variable cost(in naira)
P=Unit price of palm oil sold (in naira)
Q=Quantity of palm oil sold(in naira)

Ordinary least squares multiple regression model were equally specified as follows;
Profitability = (X_1, X_2, X_3, X_4, X_5, X_6, X_7, e)
Where
X_1 = Age (Number of years)
X_2 = Sex (Male =1, female =0)
X_3 = Marital status (Married =1, Single = 0)
X_4 =Household size (Number of persons)
X_5 = Occupation (Palm oil marketing =1, Otherwise = 0)
X_6 = Education(Number of years spent in school)
X_7 = Marketing experience(Number of years)
e =error term

Results and Discussion

Socio-Economic Characteristics of the Farmers

From table 1, below, the mean age of the palm oil marketers was 46.78 years implying that majority of them were relatively young which could have positive effects on their marketing efficiency. This supports the findings of Fewnets (2020) and Alufohai and Ahmadu(2012)that young people are more efficient in accomplishing the tedious tasks associated with oil palm production and marketing. The mean education level of 8 years implies that the respondents are literate enough, and could at least read and write, this will have great impact on their efficiency and enable them to easily adopt modern and efficient ways of marketing palm oil. The mean household size of 5 persons is not so large but means that they can be supportive to the marketers in order to reduce labour cost (Osuji et al. 2020). Marketing experience of 17 years implies that majority of the palm oil marketers are not new entrants, they are well experienced and knowledgeable in palm oil marketing and this will as well enhance efficiency. The table 1, also revealed that more men are involved in palm oil marketing, this could be because of the tediousness of palm oil marketing and this is in line with the findings of Stockbrokers, (2020) and Ehirm (2004) that the activities involved are very strenuous and could be withstood by mostly men who have the strength requirement in the grading, assembling, packaging and transport activities.

Table 1: Socio-economic characteristics of the farmers

Variables	Mean
Age	46.78
Education	8
Household size	5
Marketing experience	16.5

Gender	Frequency	Percentage
Male	46	76.67
Female	14	23.33
Total	60	100
Source:Field survey, 2017		

Estimation of the Average Cost and Returns of Palm Oil Marketing in the Area/Year

Table 2, revealed the costs and returns of palm oil marketing in the area. Total variable cost was estimated at ₦107, 101.62 which is about 98.88% of the total cost. It also showed that cost of palm oil bought formed the major cost, such that it was 74.94% of total marketing cost. This finding is in agreement with Tridge(2020) who reported that cost of acquiring palm oil was the major cost in palm oil marketing. This was followed by transportation and labour costs which amounted to ₦12, 908.89 and ₦10,34990 respectively. The gross and net margin were estimated at ₦55,288.9 and ₦54, 076.91 respectively while the marketing margin, which indicated the numerical difference between the value of sales and purchase was estimated at ₦81,221.22. Profitability ratio estimate of 0.33 implies that 33k was received as net margin for every ₦1 received as value of sales and this buttress the profitability of palm oil marketing in the study area.

Table 2: Estimation of the average cost and returns of palm oil marketing in the area/year

Items	Qty/Price/ Unit(ltr)	Value (₦)	% Total Cost
Revenue:			
Palm oil sold	303.92ltrs@534.32	162,390.53	
Total Revenue		**162,390.53**	
Variable Cost:			
Cost of palm oilbought	323.67ltrs@ 250.78	81,169.32	74.94
Cost of transport		12,908.89	11.92
Cost of labour	213.67kg@8.26	10,349.90	9.56
Cost of packagingmaterial		2,673.51	2.47
Total Variable Cost		**107,101.62**	98.88
Fixed cost			
Rent		1,212.00	1.12
Total fixed cost		**1,212.00**	1.12
Total cost: TVC+TFC		108,313.62	100.00
Gross Margin:(TR-TVC)		55,288.91	
Net Margin: (GM-TFC)		54,076.91	
Marketing Margin(SP-CP)		81.221.22	
Profitability: NM/TR		0.33	
Source: Field Survey, 2017			

Multiple Regression Analysis Results on Factors Influencing Profitability of Palm Oil Marketing in Umuahia Agricultural Zone of Abia State

The result of the multiple regression analysis on the factors influencing the profitability of palm oil

marketing is presented in Table 3 below; the linear function was selected as the lead equation based on magnitude of $R^{2,}$ significance of F-value and number of significant/explanatory variables. The coefficient of multiple determination (R^2)was 40%. This implies that the explanatory variables in the model explained 40% of the total variations in the profitability of palm oil marketing. The F statistics of 10.770 significant at 1% means that linear model has the best goodness of fit in explaining the factors that influence profitability of palm oil marketing in the area. The coefficients of age, household size, education and marketing experience were statistically significant at 5%, and further influenced the profitability of palm oil marketing in the area. However, age has a negative coefficient of (-0.083) this is consistent with apriori/hypothesis. The negative coefficient attached to age indicates a decrease in profitability with increase in age of the palm oil marketers. This is in line with the earlier studies of Ehirim (2004) and Adeokumugbowa et al, (2013) which posited that palm oil marketing involved strenuous activities of assembling, packaging and transporting from the farm gate to the local markets and young marketers could perform better than aged ones. However, the coefficients of household size was positive (0.630) which implies that increase in household size leads to increase in profitability of the palm oil marketers since household size is an important sources of family labour in agricultural marketing which reduces marketing cost and increases profitability.

Also, the coefficients of education and marketing experience were also positive, (0.417 and 0.167) respectively, this indicates that they have positive significant relationship with profitability of the palm oil marketers. The educated and experienced palm oil marketers tend to be more profitable and make much profit than the uneducated and less experienced ones. The understanding of palm oil marketing systems and structures are functions of level of education and experience. Palm oil marketers who are educated and experienced would have access to useful market information about seasonality and spatial price variations which could increase profitability. These findings are consistent with Osuji et. al. (2020), PIND (2012), Olagunju (2008), and Omoti(2002).

Table 3, Multiple regression analysis results on factors influencing profitability of palm oil marketing in Umuahia agricultural zone of Abia State

Explanatory Variables	Linear Function	Exponential Function	Semi-log Function	Double-log Function
Age	-0.083 (-2.281)**	-1.921 (-1.873)	-.002 (-1.379)	-.057 (-943)
Sex	1.074 (.862)	1.366 (1.090)	.035 (.713)	.047 (.958)
Marital status	-.348 (-232)	-.519 (-288)	-7.03-005 (-001)	-.003 (-.049)
Household size	.630 (-.232)**	2.774 (3.160)**	.034 (3.440)***	.146 (4.295)***
Occupation	-.460 (-460)	-.359 (-.355)	-.010 (-.242)	-.007 (-.191)
Education	.417 (2.247)**	2.790 (2.179)**	.014 (1.974)*	.100 (2.006)**
M. Experience	.167 (2.556)**	.970 (1.164)	005 (1.963)*	018 (.562)
Constant	18.891 (7.660)***	23.433 (3.455)***	2.873 (29.530)***	2.913 (11.032)**
R2	0.400	.3850	0.396	0.400
Adj R2	.361	345	357	361
F-Stat	10.770	9.641	10.104	10.092

Source: Field survey, 2017

Conclusion and Recommendation

In this study, palm oil marketing is dominated by the male folks as a result of the strenuous activities of assembling, packing, transportation etc involved in palm oil marketing business. The mean age of the marketers was found to be 46.7 years which implies that they are still in their productive years which had a positive effect on their marketing efficiency and profitability. Also a mean education level of 8 years indicates that they are literate enough as to adopt better marketing strategies that will enhance profitability. Total variable cost was estimated at ₦107, 101.62 which is about 98.88% of the total cost. It also showed that cost of palm oil bought formed the major cost, such that it was 74.94% of total marketing cost. Estimated profitability ratio of 0.33 implies that 33k was received as net mar- gin for every ₦1 received. The coefficients of age, household size, education and marketing experience were statistically significant at 5% and contributed significantly to palm oil profitability in the area. However, having established that palm oil marketing in the area is profitable; its marketing and management systems should be encompassing and tailored towards generating more revenue / profits against its strenuous outlook. Furthermore, relevant stakeholders should create enabling environment to make production and marketing of the product less stressful more especially for the women entrepreneurs.

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