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

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Research Article

Abstract

Purpose*: This study aims to ascertain the profitability determinants of palm oil marketing in Umuahia Agricultural Zone of Abia State, Nigeria.*

Methods: *Data on socio-economic characteristics of the respondents, cost, and returns of palm oil marketing in the area were collected using a multi-stage sampling technique from 60 palm oil marketers in Abia State. A descriptive statistical technique, marketing margin, profitability models, and the ordinary least squares multiple regression techniques were used to analyze the data obtained.*

Results: *The empirical analysis showed that palm oil marketers mean age to be 47 years with a household size of 5 persons. 77% of the palm oil marketers were males while only 23% were females. The 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. The 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.*

Implications*: Considering the net profit obtained from palm oil marketing in the area, there is a need to intensify its management and marketing strategies to further harness more profitable outcomes in the future. Also enabling environment should be created to make production and marketing of the product less stressful, especially for women entrepreneurs.*

Keywords: Profitability, Determinants, Palm oil marketing, Net-returns, Multi-stage sampling, Regression analysis.

1. Introduction

Palm oil which is a rich source of pabulum vegetable oil is mainly obtained from the African oil palm-*Elaeisguineensis.* The palm oil is extracted from the *mesocarp* (the reddish fruit) of oil palms. The high beta-carotene content of palm oil makes it naturally reddish (Tridge, 2020). Palm oil is the world`s biggest source of fat production and improved edible oil after soya bean oil. According to Stockbrokers (2020), palm oil is notably the world's second rich vegetable oil with world yearly output of fresh fruit bunches approaching 100 million metric tons per year. At present, it is also the second highest merchandised oil and chronicles for about one quarter of the world`s oil demand and supply (Ibekwe, 2008). It is interesting to note that the palm tree produces two kinds of oil, the red palm oil obtained from the fibrous layers of the nuts, and the palm kernel oil which is extracted from the kernel. The study focused on the former. It is on record that palm oil is heavily used by the manufacturing firms in the production of daily consumer products (candles, etc), various cosmetics (soaps, creams, perfumes, roll-on, etc), and majorly is used domestically as edible oil (Shahbandeh, 2020, NAN, 2019 and Mathew, 2007) and these account for high demands for the oil. The terminal point of marketing is the completion of the production cycle in which the final produced goods and services get to the end-users. Nwauwa (2012) averred that palm oil marketing is associated with several stages of operations that enable the product to get to the consumers. These processes include assemblage, storage, grading, and transportation from one end to the other. In Nigeria, the production and marketing of palm oil occur mainly in farms, homes, roadsides, local/periodic market centers, and stalls. The product is equally sold by both wholesale and retail traders in both urban and rural market centers (Olagunju, 2008, Mpoc, 2007). The distribution and marketing of agricultural products are as essential as the production itself (FAO, 2003). The spoilage nature of agricultural production requires urgent marketing and palm oil is no exception. Marketing problems oil palm exist majorly in the rural areas where there are challenges of poor infrastructures like road networks, storage and processing facilities, poor communication channels, exploitative taxes, research and planning data, high transportation cost, marketing information, poor quality control, high perishability, and its bulky nature pose great concern for both production and marketing (Fewnets, 2020). Previous studies on oil palm marketing in Nigeria had equally aligned with the above assertion (Bussiness-Insider, 2020). Other notable problems include a high level of intermediaries in the marketing/distribution chain. In the study area, palm oil marketing activities is largely dominated by the wholesalers and retailers and orchestrates the prices of palm oil with the intercept of demand and supply (Obasi, 2014). Most marketers' to make an 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 the study area is of the essence to determine whether it is profitable or not and to ascertain the depth of profits that could be received by ensuring an efficient marketing system of palm oil in the area and thus, this will increase the net returns of the marketers and further improve the nation's gross domestic product (GDP).

2. Materials and Methods

Abia State, which is located in the South-Eastern part of Nigeria was used for the study. The state lies between latitude $4^{0}40^{1}$N and $6^{0}14^{1}$North and longitudes $7^{0}10^{1}$E and $8^{0}15^{1}$E of the equator. The total land area in Abia State is about 5,243.7km^{2}, approximately 5.8% land area of Nigeria. 2006 census figures showed that the state has a total population of 2,833,999. The state shares boundaries with Ebonyi state to the North, Rivers State to the south, Cross River and the Akwa-Ibom States to the East, and Imo State to the West. Seventeen local government areas exist in Abia State grouped into three Agricultural zones namely; Aba, Umuahia, and Ohafia. The state is noted with her tropical rain forest vegetation and waving terrain. 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.

The study made use of a multi-stage sampling technique. The first stage consists of a random selection of two local government areas Ikwuano and Umuahia south from the five local government areas that make up the Umuahia agricultural zone. The zone was purposively chosen because of the high concentration of palm oil traders in the area. In the second stage, three communities from each of the two selected local government areas were randomly picked giving a total of 6 communities. Again, in the third stage, two villages from each of these communities were selected amounting to a total number of 12 villages, and, 6 palm oil marketers (wholesalers) were picked from each of these villages giving a total sample size of 72 palm oil marketers, but only 60 respondents were found useful for data analysis. The zonal Agricultural Development Programme Coordinators' (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

$$MM = (SP-PP)/SPx100/1 \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 1$$

Where,

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

$$\text{Profitability} = NR/TC \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 2$$

$$NR = TR-TC \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3$$

$$TR=P \times Q \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 4$$

$$TC=TFC+TVC \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 5$$

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 models were equally specified as follows;
Profitability = (X_1, X_2, X_3, X_4, X_5, X_6, X_7, e) ----------6
Where
Profitability = (Naira)
Then;
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

3. Results and Discussion

3.1.1 Socio-Economic Characteristics of the Farmers

From table 1 below, the mean age of the palm oil marketers was 46.78 years implying that the 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 a 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 was relatively large but could support the marketers in reducing labor costs (Osuji et al. 2020). Marketing experience of 17 years implies that the majority of the palm oil marketers were not new entrants, they are well experienced and knowledgeable in palm oil marketing and thus, enhance efficiency.

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

The table 1, also revealed that more men were 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 required in the grading, assembling, packaging and transport activities.

3.1.2 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. The total variable cost was estimated at ₦107, 101.62 which is about 98.88% of the total cost. It also showed that the 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 the cost of acquiring palm oil was the major cost in palm oil marketing. This was followed by transportation and labor costs which amounted to ₦12, 908.89, and ₦10, 34990 respectively. The gross and net margin was 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. The profitability ratio estimate of 0.33 implies that 33k was received as net margin for every ₦1 received as the 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 oil bought	323.67ltrs@ 250.78	81,169.32	74.94
Cost of transport		12,908.89	11.92
Cost of labor	213.67kg@8.26	10,349.90	9.56
Cost of packaging material		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

3.1.3 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 the magnitude of R^2, the significance of F-value, and the 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 the linear model has the best goodness of fit in explaining the factors that influenced the 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 a priori/hypothesis. The negative coefficient attached to age indicates a decrease in profitability with an increase in age of the palm oil marketers. This is in line with the earlier studies of Tridge (2020), 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 were positive (0.630) which implies that an increase in household size leads to an increase in the profitability of the palm oil marketers since the household size is an important source of family labor in agricultural marketing which reduces marketing cost and increases profitability.

The coefficients of education and marketing experience were also positive, (0.417 and 0.167) respectively, this indicates that they have a positive significant relationship with the 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 the 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 the 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

4. Conclusion and Recommendations

In this study, palm oil marketing is dominated by the male folks due to the strenuous activities of assembling, packing, transportation, etc involved in the 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 not literate enough to adopt better marketing strategies that will enhance profitability. The total variable cost was estimated at ₦107, 101.62 which is about 98.88% of the total cost. It also showed that the cost of palm oil bought constitutes the major cost. The estimated profitability ratio of 0.33 implies that 33k was received as a net margin 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 tailored towards generating more revenue/profits against its strenuous outlook. Furthermore, relevant stakeholders should create an enabling environment to make production and marketing of the product less stressful more especially for the women entrepreneurs.

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