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Structure and Performance of Palm Oil Marketing In Kogi State, Nigeria.

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Abstract

The study evaluated the structure and performance of palm oil marketing in Kogi State, Nigeria. A multi-stage random sampling procedure was employed in the selection of 120 marketers for the study. Primary data were collected with the aid of interview schedule to elicit relevant information from the marketers. Data were analyzed using descriptive statistics; Gini-coefficient model; multiple regression model and, gross and marketing margins analyses. The study showed that 76% of the marketers had 1-5 years of marketing experience. Furthermore, an average marketer had a gross margin of ₦200,830.26/annum and net revenue of ₦197,807.06/annum. This shows that palm oil marketing is a profitable business in the study area. The Gini-coefficient analysis revealed a high level of concentration and high level of inequality in the income distribution of the marketers in the study area. The low marketing margin (12%) implies that the market performed efficiently. The analysis of the factors affecting the net returns of palm oil marketers revealed that the R^2 was 0.919 which implies that the included explanatory variables explained 92% of the variation in net returns of each marketer in the study area while the F -ratio of 213.87 shows that the whole model is significant. The educational level and cost of capital input were both negative and significant at 1% and 5% level of probability, respectively. This is an indication that these costs have decreasing impact on net return. The coefficient of cost of purchase and cost of transportation were positive and significant at 1% level of probability. This is an indication that these costs have increasing impact on net return of the marketers in the study area. Based on the findings, it is therefore recommended that marketers should form cooperatives for easy access to loan so as to boost their financial base for improved performance of palm oil marketing in the State.

Key words: Marketing, structure, Gini-coefficient and marketing margin

Introduction

Nigeria's agricultural sector has experience a decline in agricultural export and domestic food supplies due to a slow growth in output that has not kept pace with population increase since 1960. Due to this incessant population growth in Nigeria, there has been the corresponding increase in demand for palm oil derived from the pulp of fruits of the oil palm (*Elaeis guineensis*) in virtually all household in the country. The oil palm is a perennial crop that originated in the tropical rain forest of West Africa. It spread to South America in the 16th century and to Asia in the 19th century (Olagunju, 2008). In recent decades, the domestic consumption of palm oil in West Africa has increased more rapidly than its production. After centuries as the leading producing and exporting region, West Africa has now become a net importer of palm oil. To bridge

this gap, there is the need for the assessment of palm oil marketing in the study area because farmer will only continue to produce as long as there is market for their product.

Palm oil marketing is concerned with all stages of operation that aid movement of the produce from the producer to the final consumer which include assemblage, storage, transportation, grading and financing (Ezealaji, 2012). Price of palm oil is basically affected by cost of production such as cost of inputs, labour cost, transportation cost, processing cost, etc. After processing the palm fruits, packaging is done using kegs, tins and drums before the onward transmission to different places and markets within the reach of the final consumers. According to Ezealaji (2012), the major distribution points for palm oil ranges from market stalls, wholesale points, palm oil depots or beaches and supermarkets. Each of these points is characterized by activities of trading associations or unionism which does not permit free entry into the business of palm oil marketing as the case may be. This compels distributors to register with substantial amount of money to join the union, buy kola and beer for the union members before being allowed to sell his goods from that location. Thus, the members fix price of palm oil through the union and force members to sell at that price.

Therefore, the study is aimed at determining the structure and performance of palm oil marketing as well as examining the factors that influence the sales revenue of palm oil marketers in the State.

Theoretical framework: The approaches to the study of marketing system include the commodity approach, the institutional approach, the functional approach, and the economic analysis of market performance. When evaluating market performance, economists have traditionally argued that a market will allocate products and resources efficiently and that no excess profits will gather to any operator when the conditions of perfect competition prevail. Because these ideal circumstances do not prevail in real world, economists face difficulty in defining the criteria for evaluating economic efficiency of markets. Agricultural economists have applied two approaches to analyzing market performance. The analysis focuses on the subsystems (processing, transportation etc.) in which measurements and analytical problems are easily identified or concentrated on analyzing the organizational structure of the system. The legal and institutional environments of markets were also considered with a view to identifying organizational characteristics likely to cause market imperfections (Fateh, 2009). The first approach led to the analysis of productive efficiency of well-defined marketing sub-systems. The second approach focused on the analysis of the market structure and the resulting performance. The method and criteria used by both the approaches are instrumental in identifying actual and potential inefficiencies in the marketing system and characteristically, lead to the development of marketing policy recommendations to

government. For example, market structure analysis provides the basis for regulatory policies (Kilmer and Armbruster, 1999). Economists have focused on the efficiency of marketing system by using the Market Structure, Conduct and Performance (SCP) model that is a basic analytical framework. The SCP model deals with the organization and operation of the free enterprise sector of the industrialized economy, and it was largely developed to help explain the behavior of industrial sector in the United States of America. The model combines economic theory and empirical observations of industrial experience in an attempt to help to understand the operations of industries and their contribution to economic development. The basic components of the model are the market structure, i.e. the number and size distribution of buyers and sellers; the conditions of entry; and the degree of product differentiation known as firm competitive behavior (conduct). Finally, the characteristics of structure and conduct determine the economic performance of the industry as a whole. This approach is essentially a way of determining how closely the actual situation in an industry approximates the conditions of perfect competition .

Methodology

The study was carried out in Kogi State. It has a total land area of 28,313.53 square kilometer and a projected population of 3,278,487 (Nigerian Bureau of Statistics (NBS), 2006) with 2.5% growth rate of 3,934,184 in 2014. The State lies on latitude 7°49'N and longitude 6°45'E with an average maximum temperature of 33.2 °C and average minimum temperature of 22.8°C. It has a geological feature depicting young sedimentary rocks and alluvium along the river beds which promote agricultural activities. The State has two distinct seasons, the dry season (November – February) and raining season (March- October). Annual rainfall ranges from 1016mm to 1524mm. The vegetation of the State consists of mixed leguminous (guinea) woodland to forest savannah and therefore, agricultural products like palm produce, yam, cassava, millet, rice, cowpea, cocoa, coffee and cashew are widely grown (Wikipedia, 2010).

Sampling Techniques: This involved a multi-stage sampling procedure. The first stage involved a random selection of 4 Local Government Areas (LGAs) namely Okene, Okehi, Adavi and Ogorimagogo. Stage two involved random selection of three towns from each LGA while the third stage involved random sampling of 10 marketers from each town/village making a total of 120 commercial palm oil marketers selected for the study. The marketers referred to in this study are the oil palm retailers.

Data collection: This involved the use of primary data collected over a period of one year (2011) with the aid of a well-structured interview schedule. The analytical techniques used included descriptive statistics to examine the socio-demographic characteristics of the marketers, gini-coefficient analysis to determine the market structure and income distribution, gross and marketing margins to determine the

marketing performance while multiple regression model was used to determine the factors influencing the sales revenue of the marketers.

The gini-coefficient is specified as:

$$GC = 1 - \sum XY \dots\dots\dots (1)$$

Where,

GC = Gini coefficient

X = proportion of sellers

Y = cumulative proportion of sales

Σ = Summation

The Gini coefficient varies from 0 to 1, where 0 implies perfect equality in the distribution (perfect market) while 1 imply perfect inequality (imperfect market). The closer the Gini-coefficient is to zero, the greater the degree of equality, the lower the level of concentration and the more competitive are the markets. Similarly, as the Gini coefficient approaches unity, the greater is the degree of inequality, the higher the level of concentration, the more imperfect the markets are, and consequently, the lower the efficiency of such markets.

The gross margin is represented as:

$$GM = GI - TVC \dots\dots\dots (2)$$

Where,

GM=Gross margin (₦/annum)

GI=Gross income (₦/annum)

TVC=Total variable cost (₦/annum)

Profitability(Net margin) analysis: The net margin is the net earnings, which a seller earns after paying all marketing costs. Net earnings of various rice marketing agencies were computed with the following formula:

$$\text{Gross Margin (GM)} = GI - TVC \dots\dots\dots (3)$$

Where:

GM = Gross Margin,

GI = Gross Income,

TVC = Total Variable Cost.

Therefore,

$$\text{Net Profit (NP)} = GM - TFC \dots\dots\dots (4)$$

Where:

NP = Net Profit,

TFC = Total Fixed Cost

Fixed cost include cost of depreciation on sales tools, rent and interest on borrowed fund

Regression analysis: The factors that influence the sales revenue of palm oil marketers were determined quantitatively using the following production function analysis;

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

Where,

Y = Sales revenue of respondent (₦)

X₁ = Labour (man days)

X₂ = Cost of purchase (₦)

X₃ = Cost of transportation (₦)

X₄ = Marketing experience (years)

X₅ = Education (years)

X₆ = Capital input cost (Depreciation) (₦)

b₁ –b₉ = the coefficients

U_i = Error term (which is assumed to have zero means and constant variance)

The explicit form of this function takes the following forms:

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + U_i \text{ (linear)}$$

$$Y = a + b_1 \ln X_1 + b_2 \ln X_2 + b_3 \ln X_3 + b_4 \ln X_4 + b_5 \ln X_5 + b_6 \ln X_6 + U_i \text{ (Semi log)}$$

$$\ln Y = a + b_1 \ln X_1 + b_2 \ln X_2 + b_3 \ln X_3 + b_4 \ln X_4 + b_5 \ln X_5 + b_6 \ln X_6 + U_i \text{ (double log)}$$

$$\ln Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + U_i \text{ (exponential)}$$

Results and Discussion

The socio-demographic characteristics of palm oil marketers were as depicted in Table 1. The results revealed that majority of the marketers (83%) were between 21 to 40 years of age while about 6.7% were above 40 years. These age distributions had positive effect on the business acumen of the marketers because majority of them were still in their active and productive age. This result is however at variance with the findings of Yusuf *et al.* (2003) who discovered that less number of young people aged between 20-40 years was engaged in agricultural marketing. The marital status of the marketers also revealed that less than half (40%) of the marketers were married while the singles formed about 28%. This implies that the marketers probably used family labour to carry out their marketing activities. This may reduce the cost of performing the various marketing functions in the study area and hence increase their income and living standard. Table 1 further revealed that majority of the marketers acquired formal education (96%). However, the highest level of education attained was secondary education (56%). Therefore, majority of the marketers were literates which could aid the marketers in the adoption of improved marketing strategies that could positively

influence the profit accruing from their marketing activities. Finally, it was revealed that 75.8% of the marketers had 1-5 years, 21.7% had 6-10 years of marketing experience while the remaining 1.70% and 0.80% had 11-15 years and 16-20 years experience, respectively.

Table 1: The socio-economic characteristics of the marketers

Variables	Frequency	Percentage
Age		
< 21 years	13	10.8
21 - 30 years	47	39.2
31 - 40 years	52	43.3
41 - 50 years	6	5
>50 years	2	1.7
Total	120	100
Sex		
Male	18	15
Female	102	85
Total	120	100
Marital Status		
Single	33	27.5
Married	48	40
Divorce	19	15.8
Separated	20	16.7
Total	120	100
Educational Level		
Tertiary education	10	8.3
Secondary education	67	55.8
Primary education	38	31.7
Quranic education	5	4.2
Total	120	100
Marketing Experience		
1 - 5 years	91	75.8
6 - 10 years	26	21.7
11 - 15 years	2	1.7
16 - 20 years	1	0.8
Total	120	100
Major Occupation		
Trading	101	84.2
Civil service	10	8.3
Student	9	7.5
Total	120	100

Source: Authors' computation

This is in conformity with Ali *et al.* (2008) who reported that marketing experience is important in determining the profit levels of marketers in that the more the experience, the more marketers understood the marketing system, condition, trends and prices.

Evaluation of performance of palm oil marketing using marketing margin analysis

It was observed in Table 2 that Okehi and Adavi LGAs had the highest and lowest marketing margin of 24.78% and 11.66%, respectively. The low marketing margin implied that the consumers were void of exploitation by the marketers and as such operated efficiently.

Table 2: Marketing margin analysis of marketers

Markets	Mean selling price/litre (₦)	Mean supply price/litre	Marketing margin%
Okene	292.25	248.75	14.88
Okehi	282.50	212.50	24.78
Adavi	283.00	250.00	11.66
Ogorimagogo	287.00	230.00	19.86

Source: Authors' computation

The profitability analysis shown in Table 3 revealed that an average palm oil marketer incurred a total variable cost of ₦637,157.24/annum with average revenue of ₦837,987.50/annum. This implies that an average marketer had gross margin of ₦200,830.26/annum and net revenue of ₦197,807.06/annum. This is a clear indication that palm oil marketing is a profitable business in the study area.

Table 3: Gross margin and profitability analysis of the marketers

Items	Amount/Marketer/tones	Percentage (%)
Variable cost		
cost of purchase	619,600.00	96.785
Cost of transportation	16,281.06	2.543
Cost of labour	510.35	0.080
Cost of storage	765.83	0.120
Total Variable Cost	637,157.24	99.528
Fixed Cost		
Cups	11.33	0.002
Bottle	19.56	0.003
Gallon	33.27	0.005
Basin	454.42	0.071
Foam	18.67	0.003
Apron	170.14	0.027
Table	154.54	0.024
Stool	152.00	0.024
Basin cover	152.10	0.024
Keg	1,857.18	0.290
Total Fixed Cost	3,023.21	0.472
Total Cost	640,180.45	1.000

Total Revenue	837,987.50
Gross Margin	200,830.26
Net Revenue	197,807.05

Field Survey, 2011

Market structure and income distribution pattern: The Gini-coefficient of 0.68 in Table 4 indicated high degree of inequality and concentration level of palm oil markets in the study area. Hence, the efficiency of the markets is low. It also implies a high level of inefficiency in the income distribution and structure of the marketers, respectively.

Table 4: Computation of Gini-coefficient of palm oil marketers in the study area / tonne

Income Range	Frequency	X	Total Sales	Y	$\sum XY$
≤ 100000	19	0.158	1,656,000	0.03	0.00435
100001 – 300000	65	0.541	11,310,000	0.22	0.10185
300000 – 500000	11	0.092	4,269,600	0.29	0.06526
500001 – 700000	2	0.017	1,041,000	0.31	0.00294
700001 - 900000	9	0.075	6,426,000	0.42	0.08008
900001 – 1100000	1	0.008	960,000	0.44	0.00128
> 1100000	13	0.108	34,524,000	1.00	0.06195
Total	120	1.00	60,186,600		0.3177

Field Survey, 2011

G.C = 0.68

Factors affecting the sales revenue of palm oil marketers: The result of multiple regression analysis of palm oil marketing is as presented in Table 5. Linear production function was selected as the lead equation because it has the highest number of significant variables and Coefficient of determination. The F-ratio value is statistically significant at 1% level of probability which implies that the whole model significantly explained variations in the revenue of the palm oil marketers in the study area. The Coefficient of determination, R^2 was 0.919. This implies that the independent variables explain at least 92% of the variation in marketers' net returns in the study area. The coefficient of capital input cost was negative but significant 5% level of probability. This shows an indirect relationship with the marketers' net returns. This is an indication that those costs had decreasing effect on net return. The coefficient of purchase cost, transportation cost, and the educational level were positive and significant at 1% level of probability. This therefore implies a positive relationship with the net return of the marketers. That is, those costs have increasing effect on net return.

Table 5: Factors affecting the sales revenue of palm oil marketer:/ what?

Variables	Regression Coefficient	T-Values
Constant	217957.10	2.159 **
Labor (X ₁)	-514.57	-0.689 NS
Cost of purchase (X ₂)	3.16	4.994 ***
Cost of transportation (X ₃)	445.65	11.961 ***
Marketing experience (X ₄)	-3420.93	-0.646 NS
Level of education (X ₅)	4.80	5.946 ***
Capital input cost (X ₆)	-48.24	-2.135 **
R ² = 0.919		
F-ratio = 213.876***		

Source: Authors' computation

NS=Not significant ***= Significant at 1% level of probability **= Significant at 5% level of probability

Table 6: Problems encountered by palm oil marketers in the study area

Problems	*Frequency	Percentage	Rank
Transportation	52	11.69	4 th
High cost of labour	41	9.21	6 th
Inadequate Storage facilities	20	4.49	8 th
High cost of storage	43	9.66	5 th
Inadequate supply	28	6.29	7 th
High cost of purchase	67	15.06	3 rd
Leakages	101	22.70	1 st
Lack of finance	93	20.90	2 nd
Total	445	100.00	

Source: Authors' computation

* Multiple response

Table 6 shows the various problems encountered by the marketers in the study area. It shows that problem of leakages ranked first, followed closely by lack of finance and high cost of purchase which can hindered the expansion of the business. Problem of inadequate storage facilities was the least of all the problems because storage containers such as kegs, drums and tins are easily accessible for purchase. All these problems, if not tackled can result in the shortage or reduction in the quantity of palm fruits purchased and hence, a fall in revenue of the marketers.

Conclusion and Recommendation

The study examined the structure and performance of palm oil marketing in Kogi State, Nigeria. The study showed that majority of the respondent (75.8%) had about 5years of marketing experience. It was also revealed that majority (85%) of the respondent were female. Furthermore, the average marketing margin of 17.80% in the State and net revenue of ₦197,807.06/tonne/annum. This shows that palm oil marketing is an

efficient and a profitable business in the study area. The gini-coefficient of 0.68 revealed that the markets in the study area were inefficient structurally. In addition, the analysis of the factors affecting the net revenue of palm oil marketers revealed that the cost of capital input was negative and significant at 5% level of probability. This is an indication that this cost had decreasing impact on their net revenue during the period. The coefficient of cost of purchase, educational level and cost of transportation were positive and significant at 1% level of probability. This is an indication that these costs have increasing impact on net return of the marketers in the study area. Based on the findings, it is therefore recommended that marketers should form cooperative for easy access to loan so as to boost their financial base for improved performance of palm oil marketing in the State. Also, government should ensure the construction and rehabilitation of bad road so as to drastically reduce transportation cost and cost of purchase of palm fruits in order to boost the revenue of the marketers.

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