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# Determinants of Marketing Margin in Palm Oil Enterprise in Edo State, Nigeria

*[1]B. Adakaren, [2]S.T. Opewa and [1]A.A. Edokpayi*

[1]Agricultural Economics and Statistical Divisions, Nigerian Institute for Oil Palm Research (NIFOR), Benin City, Nigeria
[2]Department of Agriculture, Benson Idahosa University, Ugbor, Edo State, Nigeria

**Abstract:** Palm oil marketing is a lucrative business in the chain of oil palm production; However, marketers are faced with little gross margin in the marketing of the product. This study was designed to identify the factors that determine palm oil marketing margin in Edo State, Nigeria. Multi-stage sampling procedure was used to select 180 palm oil marketers for the study. Data was analysed using multiple regression analysis. Sex, marital status, education, palm oil selling price and quantity of palm oil sold with coefficients and significant levels of -.044(5%), -.043(1%), -.101(1%), -.348(1%) and -.029(10%) respectively were found to be major determinants of the marketing margin in palm oil trading. Wholesale marketing was however more profitable than the retail market although both market levels were lucrative. Improvement on the educational background of palm oil marketers (especially married women), increase in marketers' scale of operation as well as increase in selling price of palm oil were some of the recommendations made to enhance palm oil marketers marketing margin the study area.

**Key words:** Marketing margin · Determinants · Consumption · Efficient marketing and profit

## INTRODUCTION

Palm oil is one of the preferred fat/oil in the diet of most Nigerians [1]. The demand for the product has been on the increase due to the increasing population, hikes in income and rapid urbanization [2]. At present, palm oil consumption in Nigeria is increasing at an average annual rate of 11 percent with 3 percent of the increase attributable to population growth [2]. Efforts at increasing palm oil production have not yielded the desired result as the present supply is far short of the rising annual demand hence a market shortage has persisted. To bridge this gap between domestic demand and supply, importation of palm oil has been on the rise, increasing from 110,700 in year 2000 to 160,000 metric tonnes in year 2003 [3]. The rise in the importation of the product (mostly from Asian countries where the unit cost of production is lower) has on the other hand forced down local price of palm oil thus making it less profitable for the local farmers to continue production. For the local palm oil marketers, the importation imposes even more serious consequences as the product (palm oil) is not often immediately disposed off after purchase due to the lag in effective demand.

Marketing ensures that goods and services flow from the producers to the consumers in the form, time and place of need. Buyers are in need of goods and services while the sellers in turn need to improve their socio-economic status through higher profits and enhanced income. Agricultural products have to be processed to preserve the products, convert the raw material to desirable forms, maintain the product quality, utilize the raw materials fully and ensure consumer safety [4]. Marketing provides the means of meeting these necessities. An efficient marketing sector has an important multiplier in the development of an economy. It does not only link the sellers and buyers, it also stimulates production and consumption. It guides the producer towards new production opportunities and encourages innovation and improvement in response to demand and prices [5].

The marketing margin which is the difference in prices paid for a commodity at different stages of the marketing system is an important determinant in the supply-demand chain. It is the monetary difference between purchase prices and selling prices [6]. In an earlier study by Adakaren and Orewa [7] on the socio- economic analysis of palm oil marketers in Edo State,

**Corresponding Author:** B. Adakaren, Agricultural Economics and Statistical Divisions, Nigerian Institute for Oil Palm Research (NIFOR), Benin City, Nigeria. Mob: 07033334838, 08059621627, 08080481763;
E-mail: Soblessed4real@yahoo.com

it was observed that palm oil marketing was a profitable venture at both wholesale and retail levels. However, their study showed that the marketers earned a comparatively lower marketing margin than would have been expected owing to the importance and demand of the product. This study therefore attempts to identify the determinants of the marketing margin in palm oil trade in Edo State of Nigeria.

## MATERIALS AND METHODS

The study was conducted in year 2005 in Edo State of Nigeria. The choice of Edo State was guided by the fact that it is one of the major States involved in palm oil production and marketing in the country. A sample of 180 palm oil marketers was selected for the study using multi-stage sampling technique. First, six (6) out of eighteen local government areas (L.G.As) in the State were purposively selected by the Edo State Agricultural Development Project as areas of intense oil palm cultivation and palm oil marketing. The L.G.As are Igueben, Oredo, Ikpoba Okha, Ovia South West, Ovia North East and Egor. Five out of the six L.G.As namely Ovia South West, Ovia North East, Ikpoba Okha, Oredo and Igueben were randomly selected to be studied. Nine markets (major markets for palm oil trading) were then purposively selected from the five L.G.As. The selected markets include Iguobazuwa and Udo markets in Ovia South West, Ugbogiobo and Ekiadolor markets in Ovia North East, Aduwawa and Oka markets in Ikpoba Okha, New Benin and Ekiosa markets in Oredo and Igueben market in Igueben L.G.As respectively. From each market, ten (10) wholesalers and ten (10) retailers were randomly selected giving a total of ninety (90) wholesalers and ninety (90) retailers. Data were collected using pre-tested questionnaire and oral interview. Data collected were analysed using marketing margin analysis and multiple regression analysis.

**The Analytical Tools:** Marketing margin (MM) was computed using the formular suggested by Olukosi and Isitor [8].

$$MM = \text{Selling Price- Purchase Price} \quad (1)$$

**Selling Price:** The postulated relationship between the dependent variable (marketing margin) and the explanatory variables can be explicitly expressed as:

**Linear Function:**

$$Y = B_0 + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + b_6x_6 + b_7x_7 + b_8x_8 + b_9x_9 + b_{10}x_{10} + b_{11}x_{11} + b_{12}x_{12} + e_i \quad (2)$$

**Semi-Log Function:**

$$Y = b_0 + b_1\log x_1 + b_2\log x_2 + b_3\log x_3 + b_4\log x_4 + b_5\log x_5 + b_6\log x_6 + b_7\log x_7 + b_8\log x_8 + b_9\log x_9 + b_{10}\log x_{10} + b_{11}\log x_{11} + b_{12}\log x_{12} + \log e_i \quad (3)$$

**Double Log Function:**

$$Y = b_o x_1^{b1} x_2^{b2} x_3^{b3} x_4^{b4} x_5^{b5} x_6^{b6} x_7^{b7} x_8^{b8} x_9^{b9} x_{10}^{b10} x_{11}^{b11} x_{12}^{b12} e_i \quad (4)$$

Where:

- $Y$ = Marketing margin
- $b_0$ = Constant intercept
- $b_1 - b_{12}$ = Regression coefficients
- $X_1 - x_{12}$ = Independent variables as defined below
- $X_1$ = Age of the marketers (years)
- $X_2$ = Sex of the marketers, measured as a dummy, (male=1; female=2)
- $X_3$ = Marketing experience (years)
- $X_4$ = level of education of marketer, measured as dummy, (non formal education =1, primary. education = 2, secondary education = 3, tertiary education = 4)
- $X_5$ = Marital status, measured as dummy, (married =1; single=2)
- $X_6$ = Membership of cooperative societies, measured as dummy, (member =1; non Member =2)
- $X_7$ = Transportation cost per 20 litre jerry-can of Palm oil (₦)
- $X_8$ = Club/society dues (₦)
- $X_9$ = Market charges (₦)
- $X_{10}$ = Cost price of 20 litre jerry can of palm oil (₦)
- $X_{11}$ = Selling price of 20 litre jerry-can of palm oil (₦)
- $X_{12}$ = Quantity of palm oil sold per month (20 litre jerry-cans)
- $e_i$ = Error term

The equation with the best fit among the three functional forms estimated was chosen as the lead equation.

## RESULTS AND DISCUSSION

**Socio-Economic Description of the Palm Oil Marketers:** The study showed that the majority (46%) of palm oil marketers in the study area were in the age bracket of 31-40 years (Table 1). This finding is similar to that of Audu and Abu [9]; who reported that people from 18-45 years are the major workforce that can be productive, while those below 20 and above 50 years are mostly dependants. Table 1 also showed that 93% of the palm oil marketers were females. In other words, palm oil marketing is a business best suited to women. The implication of this finding is that activities targeted at improving palm oil marketing in Edo State would produce better results if they are focused on women. The literacy level of the respondents as shown in Table 1 was high. That is, 63% of them had up to secondary school education. Palm oil marketing in Edo State was therefore expected to be relatively efficient and information based. Furthermore, the predominance of respondents with secondary school education (61%), explains the relatively young age bracket of the marketers. The socio-economic characteristics of the marketers further revealed that 71% of them were married, implying that there was need for the women to invest so as to generate income for sustenance of their children and dependants. Table 1 also showed that 65% of the palm oil marketers belonged to one or more social organizations, which means that there was high level of social interaction, hence high entrepreneurial capital among the respondents due to group synergy. The marketers were conversant with the marketing strategies involved in palm oil trade due to the high number of years of experience in the trade and so were better equipped to manage the business in terms of volume and turnover per unit period. Income from personal savings was found to be the major source of capital for palm oil trade (Table 1). Usually, this capital is not sufficient for any meaningful development in terms of business expansion.

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

| Variable | Frequency | Percentage |
|---|---|---|
| Age (Years) | | |
| <20 | 7 | 4 |
| 21-30 | 60 | 33 |
| 31-40 | 82 | 46 |
| 41-50 | 29 | 16 |
| >50 | 2 | 1 |
| Sex | | |
| Male | 13 | 7 |
| Female | 167 | 93 |
| Education | | |
| Non formal school | 17 | 9 |
| Primary school | 51 | 28 |
| Secondary school | 109 | 61 |
| Tertiary institution | 3 | 2 |
| Marital Status | | |
| Single | 52 | 29 |
| Married | 128 | 71 |
| Cooperative member | | |
| Member | 117 | 65 |
| Non member | 63 | 35 |
| Years of experience | | |
| <2 | 21 | 12 |
| 2-3 | 39 | 22 |
| 4-5 | 62 | 34 |
| >5 | 58 | 32 |
| Source of capital | | |
| Personal savings | 121 | 67 |
| Friends, clubs/society | 51 | 28 |
| Banks | 8 | 4 |

Source: Field survey, 2005

**Marketing Margin Analysis for Palm Oil Marketing in Edo State:** The peak season marketing margins for wholesale and retail palm oil trading are presented in Table 2. The results showed that wholesalers marketing margins were higher in markets located in Ovia North East and Ovia South West L.G.As. Ugbogiobo market (in Ovia Nouth East L.G.A) had the highest marketing margin of ₦655.37. While New Benin market (in Oredo L.G.A.) had the lowest marketing margin of ₦530.81. The observed differences in marketing margins was as a result of the selling price differentials arising from differences in marketing costs incurred by the traders at the different markets. The highest retail marketing margin of ₦541.38 was recorded in Oka market (in Ikpoba Okha L.G.A.), while the lowest (₦413.80) was recorded in Ugbogiobo market. On the whole, the average marketing margin per 20 litres size jerry-can of palm oil sold by wholesalers in Edo State was 581.63. While the marketing margin for the same quantity of palm oil sold by retailers was ₦470.33. The wholesale average purchase price and marketing margin per 20 litre jerry- can of palm oil constituted 80% and 20% respectively of the wholesale selling price for same quantity of oil (see Table 3). In the same vein, the average retail purchase price and marketing margin per 20 litre jerry-can of palm oil constituted 86% and 14% respectivey of the retail selling price of same volume of palm oil.

Table 2: Peak Season Marketing Margins (N) for Palm Oil Sales Per 20 Litre Jerry-Can

| | | Wholesale Market | | | Retail Market | | | Farm gate | |
|---|---|---|---|---|---|---|---|---|---|
| L.G.A. | Market | Purchase Price (pp1) | Selling Price (sp1) | Marketing margin | Purchase Price (pp2) | Selling Price (sp2) | Marketing margin | Overall marketing margin | t-value |
| Ovia South West | Iguobazuwa | 2266.35 | 2890.94 | 624.59 | 2890.94 | 3352.61 | 461.67 | 1086.26 | 35.10* |
| | Udo | 2270.11 | 2895.43 | 625.32 | 2895.43 | 3351.54 | 456.11 | 1081.43 | 23.23* |
| Ovia North East | Ugbogiobo | 2283.46 | 2938.83 | 655.37 | 2938.83 | 3352.63 | 413.80 | 1069.17 | 134.98* |
| | Ekiadolor | 2399.91 | 2968.22 | 568.31 | 2968.22 | 3459.57 | 491.35 | 1059.66 | 25.13* |
| Ikpoba Okhia | Aduwawa | 2406.64 | 2981.52 | 574.88 | 2981.52 | 3492.64 | 511.12 | 1086.00 | 29.96* |
| | Oka | 2399.99 | 2931.67 | 531.68 | 2931.67 | 3473.05 | 541.38 | 1073.06 | 41.58* |
| Oredo | New Benin | 2437.71 | 2968.52 | 530.81 | 2968.52 | 3487.03 | 518.51 | 1049.32 | 33.28* |
| | Ekiosa | 2422.12 | 2968.88 | 546.76 | 2968.88 | 3393.07 | 424.19 | 970.95 | 40.04* |
| Igueben | Igueben | 2407.94 | 2984.96 | 577.02 | 2984.96 | 3399.77 | 414.81 | 991.83 | 95.62* |
| | Total | 21294.23 | 26528.97 | 5234.74 | 26528.97 | 30761.91 | 4232.94 | 9467.68 | 458.92 |
| | Mean | 2366.03 | 2947.66 | 581.63 | 2947.66 | 3417.99 | 470.33 | 1051.96 | 50.99* |
| | Mean Deviation | 25.99 | 18.65 | 36.80 | 21.68 | 44.55 | 50.26 | 31.29 | |

*significant at 5%

Note: Marketing margin between wholesale and retail prices were significant, while marketing margin between the markets were insignificant

Table 3: Summary of the Marketing Margin Per 20 Litre Jerry-can of Palm Oil

| | Wholesale Market | | Retail Market | | Farm Gate | |
|---|---|---|---|---|---|---|
| Category | Amount (₦) | % of selling price | Amount (₦) | % of selling price | Amount (₦) | % of selling price |
| Average purchase price | 2366.03 | 80.27 | 2927.66 | 86.24 | 2366.03 | 69.22 |
| Average selling price | 2947.66 | 100 | 3417.99 | 100 | 3417.99 | 100 |
| Marketing margin | 581.63 | 19.73 | 470.33 | 13.76 | 1051.96 | 30.78 |

Source: Field survey, 2005

Table 4: Determinants of Palm Oil Marketing Margins

| Variables | Linear | Double log | Semi log |
|---|---|---|---|
| Intercept | 605.346(2.732) | 3.777(3.570) | -1034.406(-1.586) |
| Age | -.415(-.860) | -.035(-1.352) | -14.408(-.908) |
| Sex | -33.644(-2.768)*** | -.044(-2.339)** | -26.442(-2.270)** |
| Marketing experience | 0.787(.416) | .007(.568) | 1.519(.187) |
| Education | .210(2.418)* | .101(1.22)*** | .234(2.312)** |
| Marital status | 18.241(1.818)* | -.043(-2.902)*** | -24.647(-2.686)*** |
| Cooperative membership | -3.789(-.444) | -.011(-.819) | -6.563(-.760) |
| Transportation cost | -.389(-1.157)** | -.027(-1.305)*** | -15.587(-1.215)*** |
| Club dues | -101.270(-.310) | -.025(-.113)** | -38.683(-.284)* |
| Market charges | 58.238(-.270)** | -.089(-1.373)** | -53.994(-1.353)** |
| Purchase price | -.043(-.652)*** | -.015(-.739)*** | 8.963(.738)** |
| Selling price | .073(2.119)** | .348(2.695)*** | 212.149(2.667)*** |
| Quantity of palm oil sold | -.494(-.984) | -.029(-1.760)* | -20.175(-1.998)** |
| $R^2$ | .858 | .951 | .884 |
| $R^{-2}$ | .747 | .796 | .777 |
| F-ratio | 2.333** | 2.887*** | 2.667*** |
| Durbin Watson auto- correlation | 1.698 | 1.544 | 1.567 |

***Significant at 1%α – level, **Significant at 5% α - level, *Significant at 10% α – level

Source: Field survey data, 2005

Lastly, the producer's marketing margin for the same amount of oil sold was found to be 30% of the total selling prices (Table 3). The difference in the marketing margin between the wholesale and retail markets was ₦111.30. This implies that marketing at the wholesale level was more profitable than at the retail market level. This can be explained by the fact that because the wholesalers buy their palm oil in bulk, they are able to spread their marketing cost over large quantities of the commodity, hence reduced unit costs and therefore benefit from economics of scale. The difference in the marketing margin of the wholesale and retail market palm oil prices was significant at 5% level in all the markets while the marketing margins between markets were not significant as they were more or less the same.

The result of the estimation of the three equations (2), (3) and (4) are shown in Table 1. The linear function had an F- ratio that was significant at 5% $\alpha$ - level, while the double log and semi log functions had F-ratios that were significant at 1% $\alpha$ - level. However, based on economic, statistical and econometric theories, the double log function was considered to have the best fit and was therefore chosen as the lead function. The result showed that age, transportation cost, club dues, marketing charges and purchase price of palm oil were statistically significant and they maintained the right *a priori* negative signs which implies that these variables have an inverse effect on the marketers' gross margin. In other words, the older one becomes, the less efficient she is at the trade as was also revealed by Adakaren and Orewa [7] that palm oil marketers in the State had an average age of 33 years; and Audu and Abu [9] that people below 18 years and above 50 years were mainly dependants. Results from other studies also show that marketing margin decreased with increasing age [10, 11], high transportation cost [12, 13], increase in club/society dues [14], increase in market charges paid by marketers [14] and high purchase price of 20 litre jerry-can of palm oil [15]. The coefficients of Sex and marital status were statistically significant but had negative signs. The negative signs simply imply that married female marketers dominate palm oil market in Edo State. The high proportion of married women may imply that they have large household sizes and as such more dependants to charter for (in other words, more responsibilities), hence the need to be involved in productive activity. This is consistent with earlier observations by Akaluhme [16] and Dionco-Adetayo [10] that most agricultural production activities (e.g food processing and marketing) are carried out by women who usually are married. This they do to generate income to support and improve their families economically. This finding is important because it would help guide policy makers on making appropriate and sensitive laws and decisions that would impact positively on the development of the oil palm sector. It would also guide government and investors on viable areas of investment and how best to invest limited resources in order to get maximum and efficient results. For instance, it would pay off better if developmental plans on the oil palm sector are focused more on married women than on men since women dominate the business. The coefficients for level of education and years of marketing experience had positive signs implying that marketing margin increased with increase in the level of education and years of marketing experience of the marketers. Also the coefficient of education was significant at 1% $\alpha$-level, meaning that the more educated the traders were, the higher their marketing margin was because they could access and make efficient use of marketing information. A similar observation was made by Kim and Wade [17] in their study on marketing efficiency and efficient marketing in Nigeria. The coefficient for membership of cooperative societies had negative sign and was not significant. As was expected, the coefficient for selling price was both positive and significant implying that the higher the selling price of palm oil is, the higher the marketing margin. The quantity of palm oil handled per marketer had a negative and significant coefficient. This could imply that other factors (like transportation cost, market charges, e.t.c.) could be depleting the profit margin after a certain volume of palm oil marketed. Further research work is required to determine the optimum volume of palm oil to be marketed to achieve maximum marketing margin per unit of product.

## CONCLUSION

The study showed that the major determinants of the marketing margin in palm oil trading in Edo State, Nigeria are age, transportation cost, club dues and market charges. Others include, education, selling price of palm oil, quantity of palm oil sold and transportation cost of the marketers (they all had significant coefficients). In other words, policies for increasing palm oil marketer's marketing margins should be focused on improving the educational background of married women and promoting policies that will help raise the selling price of palm oil besides improving and building more road net works. The potentials are also high for palm oil marketing to help solve part of the poverty and unemployment problems in Nigeria if the marketing margin is increased substantially.

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