Economic Analysis of Palm Oil Marketing In Ile-Oluji/Oke-Igbo Local Government Area, Ondo State, Nigeria

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ABSTRACT

Price fluctuations and their impact on enterprise profitability motivated this study on the Economic Analysis of Palm Oil Marketing in Ile-Oluji/Oke-Igbo Local Government Area of Ondo State, Nigeria. Purposive and simple random sampling techniques were used to select 120 respondents, and data were collected through structured questionnaires. Analytical tools employed included descriptive statistics, Gini coefficient, budgetary analysis, and multiple regression analysis. Results revealed that palm oil marketing was dominated by females (90.8%), with most marketers being married (97.5%) and over 50 years of age (53.3%). Household size of 5–7 persons was most common (44.2%), while 79.2% had some level of formal education. About 75% of respondents had 1–10 years of marketing experience. A Gini coefficient of 0.63 and deviation of the Lorenz curve from the line of equality indicated imperfect market competition. Profitability analysis showed that palm oil marketing was viable, with a gross margin of ₦2,824,618.70, net return of ₦2,562,870, return on investment of 1.35, marketing margin of 28.7%, and marketing efficiency of 135%. Household size, age, and marketing experience significantly influenced marketing margin. Key constraints included seasonality, perishability, labour shortages, and high farm-gate prices. The study recommends government and NGO interventions through price regulation, storage infrastructure, and programmes to encourage youth and male participation in the enterprise.

Keywords: Palm Oil Marketing, Gini Coefficient, Budgetary Analytical Tools, Regression, Garret Ranking Technique

INTRODUCTION

Agriculture plays a vital role in the economic development of nations, particularly in countries where it is a significant sector. The Food and Agriculture Organization (FAO) estimates that agriculture contributes roughly 4% to the world's GDP; in underdeveloped nations, it can contribute up to 25% (FAO, 2021; Yogi *et al.*, 2025). This is true as agriculture consistently contributes around 20-25% to the GDP of Nigeria's economy, employing a vast majority of the workforce (around 70%) and driving food security (CBN, 2024).

Oil palm, scientifically known as *Elaeis guineensis*, is a versatile and economically significant crop native to West Africa. Oil palm is renowned for its high oil yield per unit area, making it one of the most efficient oil-producing crops in the world. The oil extracted from oil palm is widely used in various industries, including food, cosmetics, biofuels, and oleo chemicals (Alhaji *et al.*, 2024). Today, Nigeria is the fifth largest producer of palm oil after Indonesia, Malaysia, Thailand, and Colombia. Despite the significant contribution of agriculture to Nigeria's economy and the strategic importance of oil palm as a major cash crop, empirical research on the economics of palm oil marketing remains limited, fragmented, and insufficiently localized. While several studies have examined palm oil production, agronomic practices, and processing technologies, far less attention has been paid to the marketing dimension, particularly in terms of market structure, profitability, marketing efficiency, and the distribution of margins among actors in the value chain. (Odeyinka, 2025).

Oil palm production is inelastic, which means that it does not react quickly to an increase in demand. Harvests from highly improved varieties begin three to four years after they are planted (Verheye, 2010). In a nutshell, there are business opportunities around the product from production to marketing (Ovharhe and Amafade 2024). Hence, the need for thorough research on the economics of palm oil marketing in Nigeria, particularly concerning profitability and efficiency. As a result, the purpose of this study is to close this gap by thoroughly examining the economics of palm oil marketing in the sector. The following were the specific objectives considered in this study:

i. describe the socio-economic characteristics of palm oil marketers in the Study Area

ii. determine the structure of the palm oil market in the Study Area

iii. estimate the cost and returns of palm oil marketing in the Study Area

iv. analyze the marketing margin and efficiency of palm oil marketing in the Study Area

v. determine the effect of socio-economic characteristics of marketers on the marketing margin of the palm oil in the Study Area

vi. identify the constraints facing palm oil marketing in the Study Area.

The empirical evidence on the constraints faced by palm oil marketers, such as inadequate infrastructure, price volatility, poor access to credit, and information asymmetry, remains scarce in many oil palm-producing regions of Nigeria. This lack of location-specific data limits the formulation of targeted policies and market-driven strategies that could enhance efficiency, improve income distribution, and strengthen food security.

Therefore, this study is necessary to bridge these knowledge gaps by providing a comprehensive analysis of the economics of palm oil marketing in the study area. By examining market structure, costs and returns, marketing margins, efficiency levels, and the influence of socio-economic characteristics on marketing outcomes, the study generates empirical evidence that can inform policymakers, development practitioners, and stakeholders seeking to promote a more efficient, profitable, and sustainable palm oil marketing system in Nigeria.

METHODOLOGY

A. Study Area/Scope

The study was conducted in Ile-Oluji/Oke-Igbo Local Government Area of Ondo State, Nigeria. The area comprises major towns including Ile-Oluji, Oke-Igbo, and Bamikemo, with Ile-Oluji serving as the administrative headquarters. It lies between latitudes 6°40′–7°14′ N and longitudes 4°38′–4°53′ E, covering approximately 558 km². The projected population in 2022 was about 264,000 (NPC).

Agriculture is the dominant economic activity in the area, with cocoa as the major cash crop, alongside cassava, yam, maize, and oil palm. The presence of Cocoa Products Ile-Oluji Limited and several palm oil processing mills underscores the area's agro-industrial relevance. Animal husbandry, including poultry, goat rearing, piggery, and aquaculture, is also practiced. The inhabitants are predominantly Yoruba, with other ethnic groups such as Igbo, Hausa, Ebira, Urhobo, and Ijaw. The predominantly loamy soil supports crop production and agricultural marketing. Most residents engage in farming and trading, particularly in agricultural commodities.

B. Sampling Technique

A multi-stage sampling technique was employed in selecting respondents for the study. In the first stage, the major towns in the study area—Ile-Oluji, Oke-Igbo, and Bamikemo—were purposively selected due to the presence of major markets where most palm oil marketing activities take place. The second stage involved the purposive selection of key markets, namely Odolua Market, Oja-Oba, and Market Square, within the selected towns. In the third stage, simple random sampling was used to select 55% of palm oil marketers from the chosen markets, resulting in a total sample size of 120 respondents.

C. Data Collection

Data were collected from primary sources using a structured questionnaire administered through personal interview schedules. Information obtained included the socio-economic characteristics of respondents (such as age and level of education) as well as details on marketing activities, including marketing experience, inputs used, and quantities of output from oil palm marketing.

D. Analytical Technique

Objective 1 was analyzed using descriptive statistics, including percentages and frequency distributions. Objective 2 was analyzed using the Gini coefficient to assess market structure. The Gini coefficient is a widely used measure of dispersion for evaluating inequality in income or product distribution. Following Smith and Johnson (2010), the Gini coefficient is expressed as:

$$GC = 1 - \sum XY \quad \ldots\ldots (1)$$

where GC denotes the Gini coefficient, X represents the proportion of sellers, Y is the cumulative proportion of sales, and $\sum$ indicates summation.

The Gini coefficient ranges from 0 to 1, with values closer to zero indicating a more equal distribution, lower market concentration, and greater competitiveness, while values approaching one reflect higher inequality, increased concentration, and reduced market efficiency (Smith, 2015). The coefficient also reflects income inequality by measuring the deviation of the Lorenz curve from the 45-degree line of perfect equality. A Gini coefficient of zero occurs when the Lorenz curve coincides with the line of equality, whereas greater deviations indicate increasing inequality.

Objective 3 was analyzed using budgetary analysis such as gross margin, return per naira invested, and net returns as stated by Emokaro and Adelakun, (2015).

Gross margin analysis was employed to determine the profitability of the production enterprise. Gross margin (GM) is defined as the difference between total revenue (TR) and total variable cost (TVC) and is expressed as:

$$GM = TR - TVC \quad \ldots\ldots (2)$$

Returns per Naira invested were used in assessing the viability of the business, and is given as:

$$Return\ N{-}1 = GM / TVC \quad \ldots\ldots (3)$$

Net return, representing total profit, was determined as the difference between total revenue and total cost (TC), as shown below:

$$Net\ Return = TR - TC \quad \ldots\ldots (4)$$

Objective 4: Marketing margin analysis was used to evaluate the performance of the marketing system. Marketing margin (MM) is defined as the difference between the consumer (selling) price and the farm-gate (supply) price and is expressed as:

$$MM = \frac{Selling\ price - Supply\ Price}{Selling\ Price} \times 100 \quad \ldots\ldots (5)$$

where MM denotes marketing margin, CP is the consumer or selling price (₦), and SP is the farm-gate or supply price (₦). The decision rule adopted was that a high margin between the wholesaler's price and the supplier's price indicates inefficiency in the marketing system, whereas a lower margin suggests a more efficient system.

Marketing efficiency (ME) was measured as:

$$M.E = \frac{Total\ Revenue}{Marketing\ Cost} \times 100 \quad \text{..... (6)}$$

The value of marketing efficiency ranges from 0% to infinity. A marketing efficiency of 100% indicates a perfectly efficient market, where the price increase is sufficient to cover the marketing costs of the commodity. If the marketing efficiency is greater than 100%, it indicates excess profit, whereas a value less than 100% signifies inefficiency. In essence, the higher the percentage, the more efficient the marketing of oil palm produce is (Oguzor, 2013).

Objective 5 was analyzed using the Ordinary Least Squares (OLS) regression technique. The explicit functional form of the model is specified as:

$$y = b_0 + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + b_6x_6 + b_7x_7 + b_8x_8 + b_9x_9 + \mu \quad \text{..... (7)}$$

where y = marketing margin (MM);

x_1 = age of marketer (years);

x_2 = household size;

x_3 = marital status;

x_4 = marketing experience (years);

x_5 = educational level of marketer;

x_6 = quantity of palm oil purchased for sale (kg);

x_7 = purchase price of palm oil (₦);

x_8 = selling price of palm oil (₦);

x_9 = transportation cost (₦);

b_0–b_9 = parameters to be estimated; and

μ = stochastic error term assumed to be normally distributed with zero mean and constant variance.

Objective 6: Objective 6 was analyzed using Garrett's ranking technique to identify constraints faced by palm oil marketers. Respondents were asked to rank factors limiting palm oil marketing in the study area. The percent score was computed using the formula:

$$\text{percent score} = \frac{100(\text{Rij} - 0.50)}{\text{Ni}} \quad \text{..... (8)}$$

where R_{ij} is the rank given for the ith factor by the jth respondent, and N_i is the number of factors ranked by the ith respondent. The percent positions were converted into Garrett scores using the tables provided by Garrett and Woodworth (1969). The scores for each factor were summed across respondents and divided by the total number of respondents to obtain mean scores. Factors were then ranked in descending order, with the highest mean score indicating the most severe constraint.

RESULTS AND DISCUSSION

A. Socioeconomic Characteristics of Palm Oil Marketers in the Study Area

Table 1 summarizes the socioeconomic characteristics of palm oil marketers in the study area. The enterprise is overwhelmingly female-dominated, with women accounting for 90.8% of respondents, reflecting entrenched

socio-cultural roles and corroborating earlier findings (Ogunjinmi *et al.*, 2023). A substantial proportion of marketers (79.2%) had formal education—37.5% primary, 30.0% secondary, and 11.7% tertiary—indicating sufficient literacy to facilitate the adoption of improved marketing practices, consistent with Nse-Nelson *et al.* (2021). Married respondents constituted 97.5% of the sample, underscoring the importance of palm oil marketing as a livelihood strategy among married women, in agreement with Worlu et al. (2023). Household sizes were generally moderate, with 85.0% of respondents having between 2 and 7 members, suggesting manageable dependency ratios and potential access to family labour. The age distribution reveals that most marketers were economically active, with 46.7% aged 50 years or below and 35.0% between 50 and 60 years, indicating an ageing yet productive workforce similar to observations by Ogunjinmi *et al.* (2023). Marketing experience was relatively recent, as 75.0% of respondents had between 1 and 10 years of experience, aligning with findings by Worlu et al. (2023). Palm oil marketing was the primary occupation for 57.5% of respondents, while others engaged in supplementary trading (35.8%) or non-marketing activities (6.7%), highlighting the sector's central role in household income generation.

Table I. Distribution of Socioeconomic Characteristics of Palm Oil Marketers in Ile-Oluji/Oke-Igbo Local Government Area

Characteristics	**Frequency**	**Percentage (%)**
Sex		
Male	11	9.2
Female	109	90.8
Total	**120**	**100.0**
Educational Status		
Primary	45	37.5
Secondary	36	30.0
Tertiary	14	11.7
No Formal	25	20.8
Total	**120**	**100.0**
Marital Status		
Unmarried	3	2.5
Married	117	97.5
Total	**120**	**100.0**
Household size		
2-4	49	40.8
5-7	53	44.2
8-9	15	12.5
None	3	2.5

Total	**120**	**100.0**
Age (yrs)		
20-30	8	6.7
31-40	15	12.5
41-50	33	27.5
51—60	42	35.0
61 and above	22	18.3
Total	**120**	**100.0**
Marketing Experience (yrs)		
1-5	42	35.0
6-10	48	40.0
11 and above	30	25.0
Total	**120**	**100.0**
Occupation		
Marketing Only	69	57.5
Trading	43	35.8
Others	8	6.7
Total	**120**	**100.0**

Source: Field Survey, 2025

B. Market Structure Analysis of Palm Oil Market in the Study Area

Market structure refers to the organization and defining characteristics of a market (Garcia, 2023). Figure 1 illustrates the Lorenz curves depicting seller concentration among palm oil marketers, measured using the Gini coefficient. The curves plot the cumulative proportion of sellers against cumulative sales, while the 45-degree line represents perfect equality. Deviations from this line indicate inequality in market share and the degree of seller concentration (Osondu et al., 2024). The estimated Gini coefficient of 0.63 indicates a high level of inequality and seller concentration in the palm oil market, suggesting imperfect competition. Although no individual marketer exerts direct price control, a relatively small proportion of marketers accounts for a substantial share of total sales. This result is consistent with the findings of Osondu et al. (2024), who reported a similar Gini coefficient (0.65), further confirming the presence of high seller concentration and imperfect market conditions.

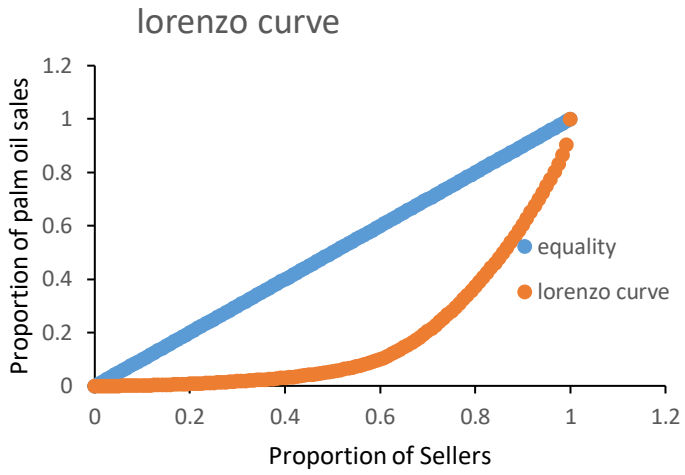

Figure 1: Lorenz curve for palm Oil Marketers in the Study Area.

Source: Field Survey, 2025 Gini coefficient = 0.633980

C. Cost and Returns Information of the Palm Oil Marketing

Table II presents the cost and return structure of palm oil marketing in the study area. The average total labour and transportation costs were ₦1,610.80 and ₦15,558.00, respectively. On average, 199 kg of palm oil was purchased for ₦7,050,087.50, resulting in a total variable cost (TVC) of ₦7,067,256.30. Fixed cost components—including funnels, measuring bottles, storage containers, shop rent, and kegs—amounted to a total fixed cost (TFC) of ₦261,748.67. The average quantity of palm oil sold was 199 kg, generating a total revenue (TR) of ₦9,891,875.00. Net profit was estimated at ₦2,562,870.00, while the gross margin was ₦2,824,618.70. The return on investment (ROI) was 1.35, and the marketing margin was approximately 29%, indicating that palm oil marketing is both viable and profitable in the study area. These findings are consistent with previous studies by Osondu et al. (2024), Smith (2015), and Johnson and Williams (2017).

Table II. Cost and Returns information on Palm Oil Marketing in the Study Area

Variables	**Quantity**	**Average Total Cost (ATC)**
Labour		1610.8
Transport		15558
Palm Oil bought (KG)	199	7050087.5
TVC (Naira)		7067256.3
Dep. Funnel	2	1408.3
Dep. Measurement Bottle	3	1412.917
Dep. Bottles	4.6	2418.75
Market Space	1	23229.7
Dep. Kegs	50.4	233279
TFC		261748.67

TC		7329005
Palm Oil Sold (KG)	199	9891875
Gross Margin (GM)		2824618.7
Net Profit (NP)		2562870
Return on Investment (ROI)		1.3496887
Marketing Margin (MM)		28.728502
Marketing Efficiency (M.E)		135%

Source: Field Survey, 2025

D. Marketing Margin and Marketing Efficiency Analysis of Palm Oil in the Study Area

Table 4.3 presents the marketing margin for palm oil in the study area. The estimated marketing margin of 28.73% (approximately 29%) represents the difference between farm-gate/wholesale prices and market prices. This margin indicates moderate price mark-ups and suggests an efficient marketing system, as the increase in selling price remains below half of the purchase price (Oguzor, 2013). The estimated marketing efficiency of 135% further confirms efficient market performance. This result is reinforced by a return on investment (ROI) of 1.35, implying that marketers realize approximately ₦1.35 for every ₦1 invested in palm oil purchase. Overall, the findings indicate fair returns to marketers and are consistent with the results of Ogunjimi et al. (2023), who reported an ROI of 1.19.

E. Socioeconomic Factors Affecting Marketing Margin

Table 4.5 presents the effects of socioeconomic factors on the marketing margin of palm oil in the study area. The adjusted R^2 value of 0.51 indicates that approximately 51% of the variation in marketing margin is explained by the socioeconomic characteristics of marketers, suggesting a moderate explanatory power of the model. Household size and age were statistically significant at the 1% level, while marketing experience was significant at the 5% level. Household size exerted a positive and significant effect on marketing margin, with a unit increase associated with an increase of ₦0.64 in margin. In contrast, age and marketing experience had negative and significant effects, reducing the marketing margin by ₦3.92 and ₦2.60, respectively. These results suggest that younger marketers and those with smaller household sizes tend to achieve higher margins, while increased age and prolonged experience may be associated with declining margin performance.

Gender and educational status were not statistically significant, implying that these variables do not exert a measurable influence on marketing margin in the study area. Overall, the findings are consistent with previous studies by Nse-Nelson et al. (2022) and Osondu et al. (2024), which identified age, household size, and marketing experience as key determinants of marketing margin and net returns.

Table III. Parameter Estimate of the Model

Variables		**OLS Estimation**		**t-significance**
	Parameter	**Coefficients**	**Standard Error**	
Constant	β_0	31.754	5.232	6.069***
Gender	β_1	3.889	3.28	1.186
Educational Status	β_2	0.54	2.079	0.26

Marital Status	β_3	-6.323	6.218	-1.017
House hold Size	β_4	0.636	0.189	3.365***
Age (yrs)	β_5	-3.924	0.78	-5.03***
Marketing Exp(yrs)	β_6	-2.603	1.153	-2.257**
Dependent Variable	MM			
Adjusted r		0.51		
R squared		0.63		

Source: Field Survey Data, 2025 *** significant @ 1%, ** significant @ 5%

E. Constraints Faced by Palm Oil Marketers in the Study Area

Table 4.6 presents the major constraints affecting palm oil marketing in the study area. Seasonality of palm oil emerged as a key constraint, limiting year-round availability and resulting in scarcity-induced price fluctuations. This finding is consistent with Nnaji et al. (2019), who identified seasonality as a major challenge in palm oil marketing. Perishability was also identified as a significant constraint, highlighting the need for adequate storage facilities to extend shelf life. This result aligns with Worlu et al. (2023), who reported inadequate storage as a major marketing constraint attributable to the perishable nature of palm oil. Inadequate labour supply further constrained marketing activities, as insufficient manpower adversely affects coordination and efficiency within the marketing process. Additionally, the high cost of purchasing palm oil from farm-gate producers or wholesalers was reported as a major constraint, contributing to increased market prices. This corroborates the findings of Osondu et al. (2024), who observed that purchase price significantly influences palm oil marketing performance.

Table IV. Constraints faced by Palm Oil Marketers in the Study Area

Constraints	**Mean**	**Rank**
Seasonality of Product	65.18	1
Perishability of Product	55.48	2
High Cost of Purchasing the product	49.91	4
Exploitation, Taxes and Charges	43.28	7
Inadequate and high cost of inputs	39.89	8
Inadequate Labour Supply	53.12	3
Transportation Problem	48.41	5
Poor Access to Credit	45.44	6

Source: Field Survey, 2025

CONCLUSION AND RECOMMENDATIONS

Based on the results of the analysis, palm oil marketing in the study area is influenced by a range of socioeconomic and structural factors, notably the ageing of marketers and the seasonality of the product. Despite these challenges, palm oil marketing remains a viable and profitable enterprise, characterized by a moderate marketing margin and satisfactory returns to investment. The findings suggest that while market performance is constrained by structural inefficiencies, the enterprise continues to provide meaningful income opportunities for participants.

Based on the findings of the study, the following recommendations are proposed:

Given the ageing profile of palm oil marketers and the significant influence of age on marketing margin, government intervention programmes—such as training on efficient marketing strategies, input subsidies, and access to credit facilities—should be strengthened to encourage youth participation in palm oil marketing. In view of the seasonal and perishable nature of palm oil, government support for the provision of modern storage facilities and related infrastructure is essential to extend shelf life and ensure year-round product availability. Government should subsidize key production inputs to reduce production costs, thereby lowering farm-gate prices and ultimately reducing market prices faced by consumers. Palm oil producers and marketers should be encouraged to form cooperatives or marketing associations to enhance access to government and non-governmental support programmes, credit facilities, and capacity-building initiatives. Investment in rural infrastructure, particularly the construction and maintenance of roads linking production sites to markets, is necessary to improve market access, reduce transportation costs, and enhance the consistent availability of palm oil at affordable prices.

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