

# Profitability Analysis of Plantain Marketing in Ohaji/Egbema Local Government Area, Imo State, Nigeria

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## ABSTRACT

The study analyzed the profitability of plantain marketing in the Ohaji/Egbema Local government area of Imo State. The specific objectives were to describe the organizational structure of plantain, to estimate the marketing margin of plantain, and to determine factors affecting the marketing margin of plantain marketing in the study area. Primary data were collected using a set of well-structured questionnaires from 60 plantain marketers from ten selected markets who were selected through 3-stage, purposive, and random sampling techniques of population size. The data collected for 60 respondents were analyzed using descriptive statistics, a marketing margin model, and ordinary least squares multiple regression analyses model. The result of the organizational structure showed a Herfindahl Hirschman Index (HHI) of 0.3 indicating a high concentration of plantain marketing in the study area. The result of the marketing margin showed that the retail price of plantain was N 4,856, the marketing cost was N 2,530, the marketing margin was N 2,326 and the percentage marketing margin was 47.89%. The result of the factors affecting the marketing margin of plantain showed that the linear functional form provided the lead equation, having possessed the highest value of coefficient of multiple determination, high value of significant variables, and high value of F-value. The value of the coefficient of multiple determinations ( $R^2$ ) was 0.967 which implies that 96.7% of the variation of the factors affecting the marketing margin of plantain in the study area was accounted for by the explanatory variables in the model. Variables such as purchasing cost ( $P > 0.05$ ) and marketing experience ( $P > 0.05$ ) were positively related to marketing margin while household size ( $P > 0.05$ ) was negatively related to net margin. The study recommended that relevant stakeholders should ensure that the plantain markets in the area are expanded since there are high concentration of the plantain markets and basic facilities that will minimize spoilage should be installed in the markets to reduce losses among the sellers.

**Keywords:** Profitability, Marketing, Marketing Margin

## INTRODUCTION

Plantain has its origin in Southeast Asia and the Western Pacific Region, it belongs to the family of 'Musaceae' and its botanical name is *Musa Paradisiaca* (Jatto, Adeoye, Abegunrin, Oke, Eniola and Smart, 2020). Although, the origin is not clear some scholars believe that Plantain was introduced by the Portuguese from India and Brazil to West-Central Africa before 3000 BC (Chiemela, Nwangwu, Nzenwa, Chiemela, Ibe and Asogwa, 2021).

The crop plays an important role in the feeding systems for both humans and animals. It has a high nutritional and dietary value such as carbohydrates, vitamins, and minerals, but is highly rich in vitamin A (Akerere, Akerele, Dada and Akomolede, 2019). Not only in the nutritional aspect of it, trading of the product equally serves as a source of employment for income generation to the rural and urban dwellers in countries like Nigeria, as such making it an important revenue earner due to the export potentials within the region (Olumba and Onunka, 2020).

In Nigeria, plantain has always been a very important traditional staple food for both rural and urban populations, annual production was estimated to be 6.7 million tons, and an average consumption of 150 kg/person/year or 348 calories per day according to (Akinyemi Adejoro, Layade & Adegbite, 2017). Despite the increasing development of the plantain industry in the early 1960s, Nigeria is yet to feature among plantain exporting nations as its production is centered heavily on local consumption rather than for export (Elum and Tigiri, 2018).

In Nigeria today, Plantain is available for a limited time, and post-harvest losses are high because it is a seasonal crop with a relatively short shelf life. The perishable nature of plantain makes its processing a vital link in the marketing process. Some important plantain products include plantain flour, plantain chips, roasted plantain (*Boli*) as well a processed form known as Dodo Ikire. Plantain is important in the diets of many Nigeria families (Agbagwa, Ewubare and Agbugba, 2020).

In Imo State, the annual production of plantain and banana is estimated to be about 20,000 metric tonnes on an average of 14 -15 tonnes per hectare and it is thriving more in the Ohaji Egbema and Ngor Okpala Local Government Areas among other L.G.A in the state where plantain is produced (Imo ADP, 2016).

Depending on the mode of consumption, it can be roasted, boiled, or fried. The peel can be used for dyeing; as a base material for alcohol production, pectin extraction, and biogas production, hence increasing the marketing potential of the product (Rana and Fanguero, 2016).

Marketing of plantain deals with all the activities, agencies, policies, and services associated with the procurement of plantain inputs by the farmers/producers and the movement of plantain products from the farm to the consumers in the market. This is mostly done from the collection in bunches scattered around villages and towns where they are produced (Sunday, Ikechi, and Phokele, 2021).

Marketing plays an important role in the assembling of plantain bunches by village collectors from the different places of production to the markets in the towns and cities. Plantain has a high marketing prospect in most of the major towns and cities where its consumption and demand are on the increase if there are good storage facilities to handle the perishability (Sunday *et al*, 2021).

According to Olumba and Onunka (2020), good infrastructures and facilities for storage, as well as processing coupled with the means of transport, are important forms for an improvement in the plantain marketing system. An efficient plantain marketing system will make an important contribution to economic development in Nigeria not only because it will increase the amount available for consumption but also because it will induce related sectors to develop. Inefficiency in plantain marketing system has become a challenge to the marketers, coupled with the unpredictable fluctuation in the prices which has become a common feature in the Nigerian economy leading to a situation where the consumers of plantain pay unreasonable prices and the Producers receive relatively low returns. This problem is associated with poor and lack of suitable storage facilities to handle the perishable nature of plantain leading to various levels of losses accrued for both the producers and the marketers alike. Several marketers have alluded long distance between production to consumption areas has compounded the problem of plantain marketing owing to price variations in some markets. Plantain experiences high price changes annually and also price differential from market to market. This has become a subject of interest as it affects plantain production, marketing, and distribution (Mgbenka, R. N. & Mbah, E. N. (2016). Several researches have been carried

out on the marketing margin of plantain, cost and return on plantain and banana marketing but this study will further look at the drivers of the Profitability of plantain in the study area, filling up the gap other researchers were not able to address in the study area. To achieve that, the study will look at the following objective:

- (i) Describe the organizational structure of plantain in the study area.
- (ii) Estimate the marketing margin of plantain in the study area.
- (iii) Determine the factors affecting the marketing margins of plantain in the study area.

## MATERIALS AND METHOD

The study was conducted in Ohaji-Egbema Local Government Area of Imo State, Nigeria. The LGA is in the Orlu Agricultural Zone with its headquarters at Mmahu. It occupies a land area of 958.010km<sup>2</sup> and has a population of about 800,904 people according to the census of 2006 (National Population Commission, (NPC) 2006) and estimated population of 942,270 as of 2020 (Imo State Government Statistics, (2021). Ohaji-Egbema is made up of 16 Autonomous Communities in the oil-rich region and the major occupation of the region is agriculture where the people engage in farming, fishing, and palm oil processing, hunting, and animal husbandry activities. The major markets in L.G.A are Eke Opuma, Nkwo Mmahu, Orié, Abacheke, Afor, Etekwuru in Egbma, Eke Awara, Ahia Mgbirichi, Orié Umuokanne and Ahia Ohada in Ohaji district.

A 3- stages technique, purposive and random sampling techniques were used to select respondents. In the first stage, five (5) Communities were selected purposively due to the high concentration of plantain market in those communities. In the second stage, two (2) markets were selected randomly from the list of existing markets in the five (5) Communities, making it a total of ten (10) markets.

Finally, in the third stage, six (6) plantain marketers were randomly selected from the list of registered associations of plantain marketers in the selected markets, making a total of sixty (60) plantain marketers. The sixty (60) plantain marketers formed the sample size for this study.

Data were collected through well-structured questionnaires which were administered to the 60 marketers selected.

Descriptive statistics, marketing margin and ordinary least squares regression model were used to achieve the objectives. *Herfindahl Hirschman Index (HHI)*, was used to measure and compare market concentration within markets, and this was computed by squaring the market share of each plantain seller competing in the market and then adding up their resulting numbers. The values increase as the number of plantain sellers in the market decreases. If the value of HHI is above 0.18, it implies high concentration, if it is below 0.01, it indicates a highly competitive market. In other to compute HHI, we assumed that our selected respondents were the only sellers in each market. For each seller, let  $Q_0$  be the quantity of plantain sold by each of our respondents. The total quantity sold in the market by the 60 respondents will equal  $q=Q_0+Q_1+Q_2\dots Q_{60}$  Let the market share of each seller be denoted by  $S_a = Q_0/q$  Therefore, Herfindahl Index (HHI) =  $S_a^2 + S_b^2 + S_c^2\dots S_{152}$ . The higher the index value, the more concentrated the market is (Hanekom *et al*, 2010).

The marketing margin model was specified as follows

$$\text{Marketing Margin} = MM = RP - MC$$

Where;

MM = Marketing Margin (N)

RP = Retail Price (N)

MC = Marketing Cost (N)

The model for determining the factors affecting the marketing margin was specified as follows in implicit form;

$$Y = F(X_1, X_2, X_3, X_4, \dots, X_8) + e$$

Where Y = Marketing Margin (N)

$X_1$  = Purchasing Cost (N)

$X_2$  = Education attainment (years)

$X_3$  = Sex (1= Male, 0 = Female)

$X_4$  = Transportation cost (N)

$X_5$  = Storage cost (N)

$X_6$  = Marketing experience (year)

$X_7$  = Marketing levy (N)

$X_8$  = Marital status (Married =1, 0 = Otherwise)

$X_9$  = Household size (Number of persons)

$X_{10}$  = Age (years)

e = error term.

$X_2, X_3, X_6, X_8, X_{10} > 0$ ;  $X_1, X_4, X_5, X_6, X_7, X_9 < 0$ .

Four functional forms will be fitted, linear, double log, semi-log and exponential functions

## RESULTS AND DISCUSSION

The market organizational structure of the plantain sellers as presented in Table 1

**Table 1** Distribution according to organizational structure

Organizational structure	Market share (MS)	(MS) <sup>2</sup>	HerfindahlHirschman Index (HHI)
Suppliers	22	484	0.091
Wholesalers	28	784	0.147
Retailers	46	2116	0.040
<b>Total sum of plantain sold (<math>\sum q</math>)</b>	<b>5340</b>		<b>HHI = 0.3</b>

Source: Field Survey Data, 2023 \* Multiple responses

Table 1 shows the result of the Herfindahl Hirschman Index (HHI) of 0.3. This implies that there is a high concentration of plantain marketers in the study area. This high concentration shows that the market is highly competitive due to serious activities of plantain marketing going on in the area.



Source: Field Survey Data, 2023

### Marketing Margin of Plantain Marketers

**Table 2:** Marketing Margin

Av. Marketing cost (N)	Av. Retail price (N)	Marketing margin (Retail price – purchasing price)	% Marketing Margin
2,530	4,856	2,326	47.89

Source: Field Survey Data, 2023.

Table 2 shows that the retail price of plantain was N 4,856 and the marketing cost was N 2,530. The marketing margin was N 2,326 per 10.2 kg bunch which was relatively profitable for such a venture and the percentage marketing margin was 47.89%. This implies that for every sale, a 47.5% margin was realized. This shows that the marketers were struggling to reach a 50% margin to cover all the costs incurred. For this 50% margin or above to be achieved, the marketers must increase the volume of plantain they sell to increase their margin. This was in line with Onuwa *et al.*, (2022), a market margin of ₦ 1900 per 100 kg bag indicated that marketing was relatively a profitable business venture.

**Table 3:** Determinants of the factors affecting the marketing margin of Plantain

Explanatory variable	+Linear function	Exponential function	Semi-log function	Double log function
<b>Constant</b>	<b>-22130.18</b> (-0.280)	<b>10.960</b> (6.974)***	<b>-2636.95</b> (-1.074)	<b>-1.225</b> (-0.367)
<b>Purchasing cost</b>	<b>0.119</b> (2.805)**	<b>4.829E-7</b> (1.644)	<b>18637.80</b> (2.130)**	<b>0.898</b> (7.559)***
<b>Education</b>	<b>28050.29</b> (0.561)	<b>0.144</b> (1.292)	<b>3881.7</b> (0.053)	<b>1.340</b> (1.344)
<b>Sex</b>	<b>-130920.56</b> (-0.672)	<b>0.203</b> (0.524)	<b>-95350.68</b> (-0.533)	<b>0.118</b> (0.485)
<b>Transportation cost</b>	<b>18.262</b> (1.100)	<b>4.287E-5</b> (1.300)	<b>-45105.56</b> (-0.510)	<b>0.004</b> (0.030)
<b>Storage cost</b>	<b>-4.219</b> (-0.304)	<b>1.010E-5</b> (0.366)	<b>65679.39</b> (0.997)	<b>0.037</b> (0.415)
<b>Marketing experience</b>	<b>50667.78</b> (2.137)**	<b>-0.055</b> (-0.563)	<b>185021.42</b> (0.709)	<b>-0.293</b> (-0.825)
<b>Marketing levy</b>	<b>2.219</b> (0.126)	<b>7.057E-6</b> (0.202)	<b>-34050.80</b> (-0.396)	<b>0.045</b> (0.385)
<b>Marital status</b>	<b>104475.07</b> (0.484)	<b>-0.149</b> (-0.384)	<b>8883.71</b> (0.048)	<b>-0.230</b> (-0.907)
<b>Household size</b>	<b>-3.300</b> (-2.101)**	<b>-0.020</b> (-0.9031)	<b>146318.70</b> (0.371)	<b>-0.293</b> (-0.546)
<b>Age</b>	<b>-31160.74</b> (-0.708)	<b>-0.032</b> (-0.360)	<b>15421.50</b> (2.4130)**	<b>-0.875</b> (-1.582)*
<b>R2</b>	<b>0.967</b>	<b>0.198</b>	<b>0.196</b>	<b>0.666</b>
<b>Adj R2</b>	<b>0.880</b>	<b>0.034</b>	<b>0.051</b>	<b>0.606</b>
<b>F value</b>	<b>5.324***</b>	<b>1.207</b>	<b>1.101</b>	<b>1.355</b>

Source: Field Survey Data, 2023.\* = significance at 10%, \*\* = significance at 5%, \*\*\* = significance at 1%.

+ = lead equation, value in parentheses are t values.

Table 10 showed that the linear functional form provided the lead equation, having possessed the highest value of coefficient of multiple determination, high value of significant variables and high value of F-value. The value of the coefficient of multiple determinations ( $R^2$ ) was 0.967 which implies that 96.7% of the variation of the factors affecting the marketing margin of plantain in the study area was accounted for by the explanatory variables in the model. Variables such as purchasing cost ( $P > 0.05$ ) and marketing experience ( $P > 0.05$ ) were positively related to marketing margin while household size ( $P > 0.05$ ) was negatively related to net margin.

The coefficient of purchasing cost was significant at five per cent and positively affected the marketing margin of plantain. This implies that as the purchasing cost increases, the marketing margin increases. This is contrary to apriori expectations which is that an increase in purchasing cost will decrease the marketing margin if the marketer spends more in purchasing.

The coefficient of marketing experience was significant at five per cent and positively affected the marketing margin. As marketing experience increases, the marketer has enough experience on how to maximize profit instead of incurring more costs.

The coefficient of household size was significant at five per cent but negatively affected the marketing margin. The smaller the household size, the higher the marketing margin. Households with more persons spend more of their income on consumption, hence this can affect marketing margin negatively.

## CONCLUSION AND RECOMMENDATION

The study concluded with the findings that there was a high concentration and competitiveness of plantain marketing in the study area. The marketing margin showed that the plantain business venture was relatively profitable, though the marketers were not able to scale a 50% margin in their business venture.

The finding further showed that experience, purchasing costs and household size were some of the factors that significantly affected the marketing margin of plantain in the study area. Based on the findings, it was recommended that relevant stakeholders should ensure that the plantain markets in the area should be expanded since there is are high concentration of the plantain markets and basic facilities that will minimize spoilage should be installed in the markets to reduce losses among the sellers.

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