Economic Analysis of Plantain Marketing in Akinyele Local Government Area in Oyo State, Nigeria

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Abstract: The study was carried out to evaluate the costs and returns to plantain marketing and to examine the structure of the market in Akinyele Local Government Area of Oyo State Nigeria. Eighty plantain marketers were selected through random sampling of the population and structural questionnaires were used to collect the data. The data were analysed using descriptive statistics, budgetary, marketing margin analysis, regression analysis and Herfindahl index. The findings revealed that most of the marketers were female and were at their active age. About 20% of them have no formal education, 60% completed their secondary school education. The gross margin gained on the sale of a bunch of plantain is N 105.06k, while N 1,275.75k is gained on a daily sale, when an average of fifteen bunches of plantain is being sold. The Herfindahl index is 0.123, this identified plantain market as a perfect competitive market. Analysis of regression result implied that there was significant relationship between some marketing activities (transportation and labour costs) and gross margin. It was therefore, recommended that plantain marketing should be ventured into because it is a profitable enterprise.

Keywords: Plantain marketing, profitability, Herfindahl index

INTRODUCTION

Plantain and modern banana originated from South East Asia and Western pacific region (John and Marchal, 1995). It belongs to the family of "*Musaceae*" and of two types "*Musa acuminata*" (genome AA) and "*Musa balbisiana*" (genome BB). Also both plantain and banana are staple food crops for many people in developing countries. In terms of gross value of production, plantain and banana are one of the most important fruits in the developing world (Akalumbe, 1994).

In terms of distribution, four main types of plantain are available in Nigeria, which are strictly based on their bunch characteristics. These are horn type, French type, false type and french-horn type. In Nigeria, the false horn type is the most widely distributed because of its ability to tolerate poor soil condition than others (John and Marchal, 1995).

Plantain marketing involves the role of middlemen in passing plantain from the farms to the markets. Therefore, the roles of markets cannot be over emphasized because production centers are fragmented and mostly in small scale. It is faced by a lot of marketing problems and these problems determine whether production can be expanded. Production problems can be

overcomed through introducing new production technology and efficient marketing system and this can only be realistic by understanding marketing system. As a seasonal crop with relatively short shelf life, plantain is available for a limited time and post harvest losses are high. The perishable nature of plantain makes processing a vital link in the marketing process. Some important plantain products include local beer (Sekete), plantain flour, plantain chips, roasted plantain (Boli) as well as processed form known as "Dodo Ikire".

Plantain is important in diet of many Nigeria families. In the urban areas, it is normally eaten in convenient forms like "Dodo (fried ripe pulp), chip (fried unripe pulp) and as plantain flour (Akinwumi, 1999). This plantain flour has an advantage over other starchy foods because it contains protein, mineral and vitamins. Medicinally plantain can be used to cure some ailments; like sore throats, tonsillitis, diarrhoea and vomiting. Due to its high nutrients, plantain is used in the production of Soymusa, which can be used in the treatment of kwashiorkor (Idachaba, 1995).

Relative attention given to plantain is focused on its production technology while little is done on its marketing. It is however obvious that increased production without corresponding increase in marketing may amount to wastage of resources. However, the issues of neglecting marketing system was first observed by Mellor (1992) who postulated that marketing system has been totally neglected in the literature on economic development. Also, Njoku and Nweke (1996) later agreed that the marketing condition changed because the sector was ignored. All these researcher and many authors have shown serious concerns for roles marketing can play in economic development. Researchers held that underplaying marketing in economic development left people on the platform of malnutrition as a result of over ripening of the produce (plantain) which led to loss or waste.

Likewise, Holton (1995) identified the effects of ineffective marketing channels and stressed that "they should be less tortuous and costly to navigate in order to facilitate flow of goods from producers to consumers". Mellor (1992) also observed that inefficiencies in the marketing functions could cause actual loss of product, while Frison and Sharoock, (1998) stressed the importance of integrating the expression of marketing function with the expression of production. Akalumbe (1994) observed the marketing and post harvest handling systems of plantain in Southern Nigeria and agreed with Njoku and Nweke (1995) that good infrastructures and facilities for storage as well as processing coupled with means of transport are important for an improvement in the plantain marketing system.

In view of the above facts it could be inferred that if marketing system of plantain is well understood, production could be expanded to ease food situation in Nigeria.

The objectives are to;

i. determine socio-economic characteristics of the plantain marketers.

ii. find-out marketing activities of plantain marketers

iii. evaluate gross margin and marketing margin earned by the plantain marketers

iv. examine the structure of the plantain market.

Hypothesis of the study is written in null form

H$_0$1: There is no significant relationship between the marketing activities of plantain marketers and their gross margin.

METHODOLOGY

The study area of this research work is Akinyele Local Government Area of Oyo State. It shares boundary with Ibadan North Local Government in the South, Afijio Local Government in the North, Lagelu Local Government in the East. The average annual rainfall is about 1200mm and ecological zone type is forest savanna type. The major occupations of the people residing in the area are farming, carpentry, trading, marketing, food processing as well as carving work. The crops types grown in the area include maize, cassava, banana, plantain, cocoyam etc.

Random sampling technique was used in selecting the respondents. In all, eighty respondents were selected from the following areas; Onidudu, Moniya, Ijaye and Oojo (i.e. twenty respondents from each area). Data were collected through a well-structured interview schedule. This was analyzed by the use of descriptive statistics and also by budgetary analysis to evaluate costs and returns of plantain marketing. Gross margin analysis was employed to determine profitability of the business. Regression analysis was used to test the hypothesis.

Mathematically:

Gross margin (GM) = Total Revenue – Total variable cost = TR -TVC

Marketing margin (Mm) = Consumer price (Cp) – Producer price (Pp)

Herfindahl index (HI)

This is used to measure concentration of the market which is one of the variables of market structure.

The market share of a marketer is denoted by $Si = qi/q$

$$HI = S_1^2 + S_2^2 + \text{--------} + S_n^2$$

$$Si^2 = \frac{1}{q_n} \quad q_i^2$$

Where; q_i = output of the plantain marketer i

q_{n} = output of all the plantain marketers

$S_i = \dfrac{\text{Output of plantain marketer i}}{\text{Number of marketers}}$

$S_n^2 = \dfrac{\text{Output of 'n' plantain marketer}}{\text{'n' number of marketers}}$

The Regression Model

Regression Analysis was used to test for the level of relationship or significance between the gross margin (dependent variables) and marketing activities (independent variables).

Here

Y = gross margin (dependent variables)

$X_1 - X_4$ = Marketing activities (independent variables)

$Y = F(X_1, X_2, X_3, X_4, e)$

Y = Gross margin (N)

X_1 = Transportation Cost (N)

X_2 = Labour Cost (N)

X_3 = Storage Cost (N)

X_4 = Trading Material Cost (N)

e = Error term

General forms of the two functional forms used are:

(1)   Linear Function

$Y = b_0 + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + e$

(2)   Log Function

$Log\ Y = b_0 + b_1logx_1 + b_2logx_2 + b_3logx_3 + b_4logx_4 + e$

RESULTS AND DISCUSSION

Socio-economic Characteristics of the Respondents

The finding revealed that 43% of the respondents were within the age range of 31-40 years and 60% completed their secondary school education, this indicated that most of the plantain marketers were in their active age but were not well educated. Larger percentage of the plantain marketers were female (88%) and married (64%), it was also discovered that about 45% of the marketers had an average of four people in their household.

Table 1. Socio -economic Characteristics of Respondents

Age (yrs)	Frequency	Percentages
< 20	2	3
21-30	18	23
31-40	35	43
41-50	15	18
51 and above	10	13
Level of Education		
0	16	20
1- 3	08	10
4- 6	48	60
7- 9	08	10
Gender		
Male	10	12
Female	70	88
Marital status		
Single	20	25
Separated	0	0
Divorced	0	0
Widowed	9	11
Married	51	64

Household size		
≤ 2	12	15
3 –5	36	45
6 – 8	28	35
> 8	04	05
Total	**80**	**100**

Source; Field Survey 2004

Marketing Activities of Plantain Marketers

Table 2 showed the initial capital used to start plantain marketing, it was revealed that larger percentage of the marketers (48%) used about N2,500 - N5,000 to start the business while 22.5% of the marketers used an average of N1,500. It was therefore discovered that plantain marketing was easy and cheap business to start. Losses of plantain were minimized by processing the over ripe plantain to indigenous snack food called "Dodo Ikire".   About 80% of the marketers confirmed this information.

The findings in Table 3 revealed marketing activities that the marketers engaged in order to make the produce (plantain) available in the markets on daily basis; this is associated with transportation cost, labour cost and trading material cost.

Table 2: Initial capital used to start plantain marketing

Initial Capital (N)	Frequency	Percent
< 500	4	5
500 – 2,500	18	22.5
2,501 – 5,000	38	47.5
5,001 – 7,500	10	12.5
7,501 – 10,000	8	10
>10,000	2	2.5
Total	80	100.0
Method of Minimizing Losses		
Processing	64	80
Sell at cheaper price	12	15
Storing	4	5
Total	80	100.0

Source; Field Survey, 2004

Table 3: Variable costs spent on marketing activities on plantain per day

Marketing activities	Amount spent per day (N)
Transportation	750.5
Labour	100.0
Trading material	55.5
Total	906.0

Source; Field Survey 2004

Analysis of Costs and Returns

Gross Margin (GM) Analysis/ Bunch

Total Cost (TC) = Total Fixed Cost + Total Variable Cost =T FC + TVC

Total Revenue (TR) =Selling price per bunch = N295.80 per bunch

Total Variable cost (TVC) = Cost of plantain (bunch) + Marketing activities cost (per bunch)

TVC = N 150.35 + N 39.85 = N 190.20 per bunch

GM　　=　　Total Revenue – Variable Cost

　　　=　　N295.80 - N 190.20

　　　=　　**N 105.6 per bunch**

Gross Margin (GM) Analysis/ Day

Total Revenue = 　N 4,437 per day (average of 15 bunches of plantain)

Total Variable cost = Cost of plantain (bunch) + Marketing activities cost (per day)

　　　= N2,255.25 +　N 906.0 =　N 3,161.25

GM　　=　　Total Revenue – Variable Cost

　　　=　　N4,437.00　-　N 3,161.25

　　　=　　**N1,275.75 per day**

Therefore the gross margin gained on the sale of a bunch of plantain is N 105.6, while N 1,275.75 is gained on a daily sale.

Marketing margin

Marketing Margin (Mm) = Cp - Pp

Cp = Consumer price = selling price

Pp = 　Producer price = cost of plantain from the farm

Mm = 　N295.80- N 150.35

　　= N 145.45 per bunch

The marketing margin is 　N 145.45 per bunch

Structure of Plantain market

The Herfindahl index is 0.123 (i.e. 12.3%). The low index number signified low concentration of market shares and that there was a situation of structurally perfect competition.

Regression Analysis

In order to test whether the marketing costs of plantain were significantly related to gross margin, some measured variables were subjected to regression analysis. Both linear and log functions were used.　The linear function gave the best fit of the two tested function based on the co-efficient and the magnitude of R^2.

The functional equation of the linear function is given as

　　(3)　　Linear Function

$Y = b_0 + b_1 X_1 + b_2 X_2 + b_3 X_3 + b_4 X_4 + e_i$

$Y = 980.78 + 1.491 X_1** + 3.046 X_2* + 0.864 X_3 + 0.0045 X_4$

　(2.241)　　(3.669)　　(0.632)　　(1.015)

　　　The　co-efficient　of　multiple determinations (R^2) is 64.4%, which indicates that 64.4% variation in gross margin is caused by the independent variables while the remaining 35.6% is due to error term. The value of F-Test (3.32) obtained shows that overall equation is statistically significant at 5% probability level. With this result the null hypothesis (H_o) is rejected.

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The result of regression analysis thus showed that the explanatory variables, X_1 and X_2 are positively significant at 5% and 1% respectively, while X_3 and X_4 are not significant at all. This means that when the transportation cost (X_1) increases, gross margin will also increases because marketers will always increase their selling price in order to cover the costs. It also implies that marketers who spent more on transportation went to remote areas where they obtained cheaper plantains. The co-efficient of labour cost (X_2) is positive and statistically significant, which means that as the labour cost increases, gross margin also increases due to the increase in the selling price, which was as a result of high labour cost. However, the co-efficient of storage cost (X_3) and trading material cost (X_4) are not significant. Implying that storage costs and trading materials have insignificant influence on gross margin.

CONCLUSION

Plantain market is a perfect competitive market and the business is easy to start with moderate initial capital. Plantain marketing is quite profitable with high gross margin and marketing margin which are subject to increase as marketers source produce from remote communities. The over-ripe plantain can easily be processed into indigenous delicacies. The study also revealed that transportation and labour cost were the major factors affecting returns on plantain.

RECOMMENDATION

Based on the research findings the following are recommended. There is need for provision of basic marketing facilities such as infrastructural facilities, credit facilities which will eventually enhance marketing efficiency positively. Development/adoption of better techniques that will simplify processing is needful. Policies aimed at increasing total production through genetic improvement should be made.

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