Comparative analysis of plantain marketing efficiencies between rural and urban markets of two local government areas of Abia State, Nigeria

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Abstract

The study compared the marketing efficiencies of plantain between rural and urban markets in Ikwuano and Umuahia North Local Government Areas of Abia State, Nigeria. A two stage sampling technique was used to select plantain marketers for the study. Stage one involved the purposive selection of two major plantain markets due to the activities of plantain marketing in the markets. The second stage involved the random selection of forty plantain marketers from each of the two markets to give a total of eighty plantain marketers for the study. Data collected were analyzed using descriptive statistics such as mean, frequency and percentages, marketing efficiency formular was also used.   Other models such as regression model and Z test were employed to realize the objectives. The result showed that plantain marketers were in their active age with a mean age of 38 and 35 for Ndioru and Urie-Ugba markets respectively. The marketers in both markets were educated, had relatively small household sizes of 5 and 4 persons for Ndioru and Orie - Ugba respectively. The marketers also had marketing experience of 13 and 10 years for Ndioru and Orie -Ugba respectively. The marketing efficiency values were 32.11 and 31.18 for Ndioru and Orie-Ugba respectively, although they represent inefficient market situations. The coefficient of education, quantity sold and selling price positively influenced marketing efficiency in Ndioru market while variables such as marketing experience, selling price and household size positively influenced marketing efficiency in Orie -Ugba market. The study shows that there was a significant difference between the marketing efficiencies of Ndioru and that of Orie-Ugba markets. The study therefore recommends that variables that positively influence marketing efficiency be improved upon.
Keywords: Comparative, marketing, efficiency, rural and urban markets

1. Introduction

Plantain is a common arable food crop usually planted by farmers in the south eastern part of Nigeria. Plantain and banana occupied strategic positions in agricultural production across the Continent.   Plantains and bananas represent the world's second largest fruit crop with an annual production of 144 million metric tons (FAOSTAT, 2013). Banana and plantain rank as the fourth most important global food commodity after rice, wheat and maize in terms of gross value of production (Shaibu, and Ogburia, 2012). Nigeria is one of the major plantain

producing and consuming countries in Africa, and is ranked among the 20 most important plantain producing countries worldwide (FAO, (2011); Ayanwale, Fatunbi and Ojo (2016)). Plantain plays vital roles in the feeding of both human beings and farm animals. As a perennial crop that can fruit all year round once established at the first year, they are used to combat the problem of food insecurity among the farmers, marketers and the general populace. Plantain and banana are major sources of food in many regions of the world Idumah, Owombo, Ighodaro, and Mangodo, 2016**)**. About 70 million people in the African sub-region are estimated to derive more than one quarter of their food energy requirements from plantain. Plantain is very critical in bridging the gap between the demand and supply of the basic carbohydrate staples (Idumah, *et al.,* 2016). More so it is very rich in vitamin A when consumed unripe. At the household levels, it can be consumed fried, boiled, pounded, roasted and can be dried and grounded into flour. Apart from its consumption as a staple food; plantain is also used in the food industries for the manufacture of chips, flakes, cakes, thereby creating important job opportunities to the populace directly or indirectly and invariably income for small holder farmers and marketers. The marketing of plantain can create huge employment for small scale business men and the industries where the products are used to produce other products for human consumption or animal. The marketing of agricultural produces in the developing countries suffer the issues of inefficiency where grading and standardization of produce is not a culture of marketer rather individual marketers exploit every opportunity to increase their margins and hence profit. In an efficient marketing system, it is expected that as the commodities move from production point to consumption centres all participants both producers, transporters, consumers along the marketing chain are rewarded adequately for every marketing roles /function played. More so, economic theory stipulates that, the cost of products at off season should rise or increase by the cost of storage of grains, an increase in price higher than the storage cost provides the traders opportunity to make abnormal profit. According to Reddy, Ram, Sastry, and Devi (2004) transportation costs add to the price differential of product between two distinct markets (Spatially separated markets) and processing cost should lead to price difference charged due to change in form of product. For instance, when plantain fruits are converted to plantain chips, the price difference between plantain fruit and plantain chips accounts for processing cost. This is because whenever marketing functions are performed, they are undertaken at cost, adding time, place and form utilities hence the product attract higher value or price at every point of the marketing channel. Here efficiency of marketing is concerned with the extent to which commodities prices deviate from the cost of performing these functions. If the price deviation of the commodities in the process is much, it could lead to inefficiency. Thus pricing efficiency is affected by the rigidity of the marketing cost, nature and degree of competition in the market (Reddy, *et al.,* 2004). If the middlemen are ambitious and exploitative of the market situations, it leads to pricing inefficiency and also high marketing cost of commodities lead to pricing inefficiency. More so when a market is dominated by farm firms that conspire to maintain high prices through unionism it could also result to inefficiency. Pricing efficiency could be enhanced by dissemination of relevant market information, market news, market research, grading and standardization and quality control of commodities. Marketing channel is the path way followed by products as they move from production point to consumption centre. Marketing channel could be simple or complex. In simple channel products move from producers to wholesalers, retailers and finally to consumers with each participants making a margin as net return.

In recent times statistics has shown that output of plantain production in Nigeria has doubled in the last 20 years, despite having a production system concentrated in the hands of small

scale farmers (Akinyemi *et al.*, 2008). This increase in output is due to relative attention given to plantain production technology. The increased output requires adequate marketing because the commodity has a very low shelf life. Unfortunately, little or nothing at all has been done on its marketing. It is obvious that increased production without corresponding increase in marketing may amount to wastage of scarce resources. Furthermore, as a seasonal crop with relatively short shelf life, plantain is available for a limited time and postharvest losses are high. The perishable nature of agricultural produce in general and plantain in particular could affect the profitability and efficiency of its marketing hence the study investigated (i) socio -economic characteristics of the plantain marketers (ii) describes the flow channel of plantain marketing in the study area (iii) ascertained the marketing efficiency (iv) estimated the determinants of marketing efficiency and compare the mean marketing efficiencies of the two markets.

2. Methodology

The study was carried out in two Local Government Areas of Abia State (LGAs). The LGAs are Ikwuano and Umuahia North. Ikwuano LGA has its headquarter in IsialaOboro. It is located between $5^0 31^0$ N latitude and $7^0 37^0$E longitude. Ikwuano LGA is referred to as the food basket of Abia State because she is endowed with rich agricultural produce. Ikwuano is located in the southeastern part of the state. It is bounded on the north by Isiukwuato L.G.A, north-west by Obowo L.G.A of Imo State, South-west by ObiomaNgwa and Bende L.G.A in the East. Umuahia North LGA is located between Latitude 7°29°N and Longitude 5°32°E with its headquarters in Umuahia. It has an area of 245km^2 with a projected population estimate of 192,209.3 National Bureau of Statistics (NBS, 2018). It is bounded on the North by Bende and the South by Umuahia South, on the East by Ikwuano and Isuikwuato on the West. Agriculture is the major occupation of the people in these two local government areas. They produce food crops like maize, cassava, plantain, banana also small ruminant animals are reared. Some of the people engage in craft making, carpentry, trading and others. A two stage sampling procedure was use for the study. First stage involved a purposive selection of Ndioru a rural market and Urie- Ugba an urban market from each of the LGAs based on the level of plantain marketing activities in these markets. Ndioru and Orie-Ugba markets serve as farm gate markets where producers sell directly to retailers and consumers. Ndioru market is a weekly market held every seven days while Orie –Ugba market is a daily market. Stage two involved a random selection of 40 plantain marketers from each market. This gave a total of eighty (80) plantain marketers for the study Primary data were used for the study. Primary data were collected through the use of structured questionnaire. The first objective on socio-economic characteristics was achieved using descriptive statistics, the second objective on marketing channels of plantain was realized using schema. For objectives three and four which were to estimate the marketing efficiencies of the two markets and their determinants were analyzed using efficiency formulae and regression model respectively. Since it is easier to estimate the input of marketing than the output, in certain cases consumer satisfaction can be used as a proxy for measuring the output of marketing. Therefore, the price consumers are willing to pay can be used as a measure of consumer's satisfaction. Marketing efficiency can therefore be given as:

$$ME = \frac{Net\ return}{Total\ Marketing\ Cost} \times \frac{100}{1} \qquad (1)$$

Objective 4 on the determinants of marketing efficiency of the two markets were analyzed using regression model. The explicit form of the model is stated thus:

$$Y = f\ (X_1,\ X_2,\ X_3, X_4,\ X_5,\ X_6, X_7,\ X_8 + e) \tag{2}$$

Y = efficiency of plantain marketers in (percentage)
X_1 = Age of respondent in years
X_2 = Level of education in years
X_3 = Marketing experience (years)
X_4 = Selling price (Naira)
X_5 = Cost of transportation (Naira)
X_6 = Quantity of product sold(kg/month)
X_7 = Household size (number of persons)
X_8 = Location (Urban, 1=, Rural =0)
ei = Error term
b_o = Slope
b = Co-efficient

objective (v) that dealt on comparing the mean marketing efficiencies of the two markets was achieved using z test, the formular is stated as thus.

$$Z_{cal} = \frac{(X_1 - X_2)}{(SX_1 - X_2)} \tag{3}$$

$$= SX_1 - X_2 \sqrt{\frac{S^2 X_1}{n_1} + \frac{S^2 X_2}{n_2}} \tag{4}$$

3. Results and Discussion

The socio economic characteristics of the plantain marketers are presented in Table 1.
The result showed that majority of the plantain marketers in both markets fell within the age 31-40 years with Ndioru and Orie- Ugba having mean ages of 38 and 35 years respectively. This results show that the marketers were still in their active ages. They are agile and can withstand any stress involved in plantain marketing. This corroborates with the findings of Aina *et al.,* (2012) and Oladejo and Sanusi (2011) who reported that plantain marketers in their study areas were women who were vibrant and energetic and positively influence marketing. The table also showed that 50% and 42.5% of Ndioru and Orie -Ugba marketers had primary school education respectively. About 30% and 35% of Ndioru and Orie- Ugba marketers' had secondary school education respectively. On tertiary education about 10% and 15% Ndioru and Orie -Ugba marketers had tertiary education while 10% and 7.5% of Ndioru and Orie -Ugba marketer had no form of formal education. Hence it could be concluded that plantain marketers in the study area were educated. This is in conformity with the research of Benjamin and Victoria (2012) who posited that education affects the way farm business and marketing is managed as well as the overall production. More so the result showed that the study was dominated by female marketers with Ndioru having 87.5% and Orie-Ugba 75%. However, male plantain marketers were 12.5% in Ndioru and 25% in Orie -Ugba respectively. This is in line with Nwaru *et al.,* (2011) who posited that women feature prominently in marketing especially in rural markets where men constitute less than 5 percent of the trader. On marital status the result showed that 20% and 30% of plantain

marketers were single for Ndioru and Orie -Ugba respectively. About 75% and 70% of the marketers were married in Ndioru and Orie- Ugba respectively. This implies that married marketers dominated the business. This is in line with Kainga and Adeyemo (2012) who reported that fish marketers were dominated by married people. Furthermore, the result also showed that Ndioru had a mean household size of 5 persons while Orie- Ugba had a mean household size of 4 persons. This implies that Orie -Ugba marketers had smaller household size than Ndioru marketers. In addition, the result showed that Ndioru and Orie -Ugba marketers had mean marketing experiences of 13 and 10 years respectively. This implies that the marketers had wealth of experience to overcome or handle marketing challenges that could arise from plantain marketing. The findings corroborate the work of Obasi (2008) who posited that increased marketing experience help marketers adapt to new innovations that positively influence marketing.

Table 1: Socio economic characteristics of the plantain marketers in the study area

Location	Ndioru		Orie-Ugba	
Variables	Frequency	Percentage	frequency	Percentage
Age				
<20	2	5.00	1	2.50
21-30	6	15.00	12	30.00
31-40	17	42.00	15	37.50
40-50	10	25.00	9	22.50
>50	5	12.50	3	7.50
Mean	38		35.5	
Total	40	100	40	100
Level of education				
No formal education	4	10.00	3	7.50
Primary	20	50.00	17	42.50
Secondary	12	30.00	14	35.00
Tertiary	4	10.00	6	15.00
Total	40	100	40	100
Sex				
Female	35	87.5	30	75.00
Male	5	12.5	10	25.00
Total	40	100	40	100
Marital status				
Single	8	20	12	30
Married	30	75	28	70
Widowed	2	5		
Total	40	100	40	100
Household size				
2-5	22	55.0	20	50.00
6-9	18	45.00	20	50.00
Mean	5		4	
Total	40	100	40	100
Marketing experience				
1-10	13	32.5	22	55.00
11-20	20	50.00	18	45.00
>20	7	17.50		
Mean	13		10	
Total	40	100	40	100

Source: Field survey 2016

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The marketing channel of plantain is presented in figure 1.

The result in figure 1 shows that plantain marketing moves from the producers in this case is Akwa-Ibom and Abia States (Ariam and Ndioru) to Umuahia wholesalers. They sometimes sell to the retailers directly. The wholesalers sell to the retailers and in some cases to the final consumer. Also retailers buy from the producers and wholesalers and sell to the final consumers. Nse - Nelson *et al.*, (2016) reported that plantain marketing channel was a simple channel in which the plantains were routed from producer, through wholesalers, retailers and final consumers.

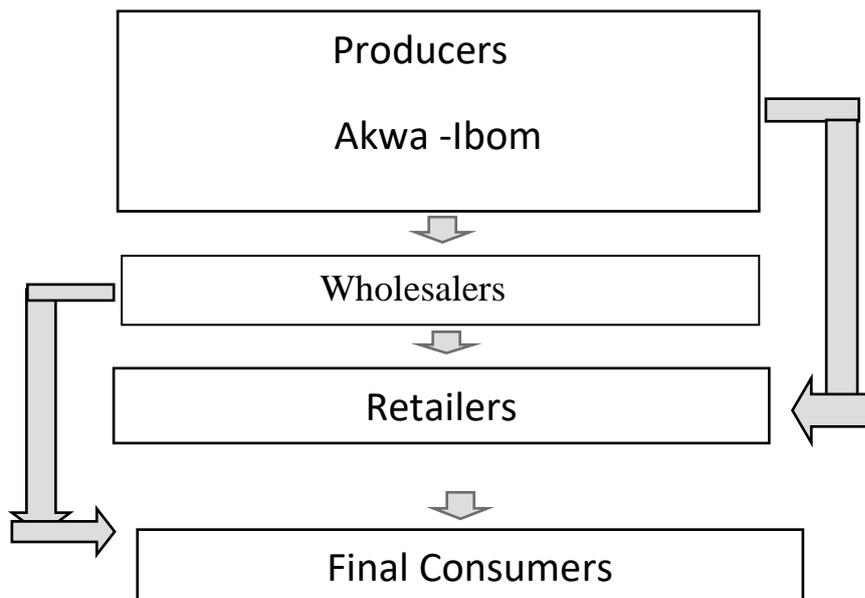Schema of the marketing channel of plantain in the study area

Fig. 1: Flow Chart Showing the Channel of Plantain Marketing.

The result of marketing efficiency gave the values of 32.11% and 31. 18% for Ndioru and Orie-Ugba respectively. Olukosi *et al., (*2005) posited that values greater than 100 are high efficiency, less than 100 are inefficient while exactly 100 are efficient. The finding is similar to the study of Njuko, (2017) who reported a marketing efficiency of 7.69% for Irvingia wholesale marketers in Imo State. This is because both studies represent inefficient situations

Table 2: Estimate of marketing efficiencies of plantain marketing in the study area

Location		Ndioru	Urie-Ugba
Total return		250673.83	237625.21
Total variable		189502.36	181035.111
Depreciated fixed cost		250.15	104.42
Total cost		189752.51	181139.53
M.E	32.11	31.18	

Source: Field survey 2016

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Regression Analysis for factors Influencing Marketing Efficiency of plantain marketing for Ndioru (Rural) market

Table 3 showed the estimate of factors influencing marketing efficiency of plantain marketing in Ndioru market. The Semi- log functional form was chosen as the lead equation. This is because of its R^2 value and number of significant variables. The R^2 value of 0.782 was estimated. This implied that 78.20% of the variability in the marketing efficiency is accounted for by the independent variables. The F-ratio of 3.76 is highly significant at 1% and therefore implies a goodness of fit. The significant variables were Age (X_1), Level of education (X_2), Cost of transport (X_5), Selling price (X_4) and Quantity Sold (X_6). The coefficient of Level of Education, Selling price and Quantity Sold were positively signed. This is as expected and conforms to *a priori* expectation. These coefficients were also significant at 1%, 1%, and 10% respectively. This implies that an increase in any of these variables will lead to further increase in the marketing efficiency of the plantain marketers. The coefficient of age and cost of transportation was negatively signed and statistically significance at 10% and 5% respectively. This means that these coefficients are inversely related to marketing efficiency. This implies that an increase in these variables will lead to a decrease in marketing efficiency and vice versa.

Table 3: Regression estimate of the determinant of marketing efficiency in Ndioru (Rural) market

Variables	Linear	Semi log (+)	Double	Exponential
Constant	-142.08	26.04	13.06	2634.06
	(16.08)***	(3.89)***	(1.98)*	(2.80)***
Age (X_1)	-0.42	-0.82	-0.80	-0.62
	(-1.06)	(2.04)*	(2.09)*	(-0.81)
Level of Education (X_2)	0.10	0.34	0.42	0.09
	(1.64)	(6.26)***	(0.93)	(0.60)
Marketing Experience (X_3)	0.10	0.26	0.41	0.20
	(1.02)	(0.92)	(0.30)	(1.64)
Selling Price (X_4)	0.62	0.01	0.62	0.70
	(8.06)***	(4.26)***	(1.94)*	(1.96)*
Cost of transportation (X_5)	-0.46	-0.42	-0.34	0.49
	(2.08)*	(`2.51)**	(2.00)*	(3.80)***
Quantity sold (X_6)	0.03	0.20	0.34	0.76
	(1.99)*	(1.96)*	(2.86)***	(0.96
Household Size (X_7)	2.10	0.24	0.10	0.66
	(1.11)	(0.90)	(0.80)	(1.42)
	0.651	0.782	0.662	0.553
R^2	0.651	0.682	0.604	0.489
R^{-2}	7.87***	3.76***	3.84***	2.06*
F-value				

Source: Field Survey, 2016.

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Note: Values in parenthesis are t-value* = Significance 10% ** = Significance 5% *** = Significance 1%, (+) = Lead equation

Table 4 showed the estimate of factors influencing marketing efficiency of plantain in Urie – Ugba (Urban) market in Umuahia North LGA of Abia State, Nigeria. The result depicted that the Linear functional form was chosen as the lead equation based on its R^2 value and number of significant variables. F- Value of 23.43 was highly significance at 1%, implying goodness of fit. The coefficient of selling price, household size and marketing experience were positive and statistically significant at 1%, 5%, and 10% respectively. These are as expected and conformed to *a priori* expectation. This implies that as the variables increases, the marketing efficiency of the plantain marketers also increases. The household Size being positive may be due to the relative moderate household size in the study area which also could aid in the marketing of plantain. This result is contrary to the findings of Nwaru *et al.,* (2011) who reported that household size had a negative influence on net return and marketing efficiency of banana marketing.

Table 4: Regression Analysis on factors influencing Marketing Efficiency of plantain in Orie Ugba (Urban) Market

Variables	Linear (+)	Semi log	Double log	Exponential
Constant	0.49 $(14.39)^{***}$	-0.76 (-1.04)	-1.09 (-0.09)	-0.90 $(-2.06)^{*}$
Age (X_1)	-0.53 (1.72)	-0.10 -(0.62)	-0.01 $(3.00)^{***}$	-0.92 (1.00)
Level of Education (X_2)	0.09 (1.02)	0.06 (1.42)	0.06 (0.90)	0.62 (1.09)
Marketing Experience (X_3)	0.39 $(2.06)^{*}$	0.62 (1.08)	3.00 (1.06)	0.90 (0.80)
Selling price (X_4)	2.07 $(9.60)^{***}$	3.01 $(3.80)^{***}$	0.90 $(2.10)^{*}$	0.29 $(1.92)^{*}$
Cost of Transport (X_5)	-0.20 (-0.90)	-0.40 (-0.90)	-2.00 (1.09)	-0.29 (1.14)
Quantity Sold (X_6)	0.90 (1.06)	0.10 $(1.90)^{*}$	0.86 (0.92)	0.06 (0.90)
Household Size (X_7)	0.90 $(2.42)^{**}$	2.01 (0.30)	2.01 (1.02)	0.30 (1.09)
R^2	0.801	0.623	0.532	0.556
R^{-2}	0.763		0.501	0.512
F-value	23.43^{***}	0,605 3.06^{***}	2.06^{*}	4.06***

Source: Field Survey, 2016

Note: Values in parenthesis are t-value* = Significance at 10%** = Significance at 5%

(+) = Lead equation ***` = Significance at 1

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To compare the mean marketing efficiencies of the two markets we used the Z test which is presented in Table 5.

The result showed a Mean Marketing Efficiency of 57.589 and 54.885 for Ndioru and Urie-Ugba markets respectively. It has a Z-cal 230.786 and the Critical Z (two-tail) value of 1.991.

Decision: Since Z-cal is greater than Z-tab, we reject the null hypothesis that states that there is no difference in their mean and conclude that there is difference between the mean efficiency for Ndioro and Orie Ugba market and that they do not operate at same marketing efficiency level.

Table 5: Mean difference of marketing efficiencies between Ndioru and Orie -Ugba markets (Z-Test)

	Marketing Efficiency	**Marketing Efficiency**
Mean	57.5893	54.8891
Known Variance	1271.356	1266.106
Observation	40	40
Z	230.786	
Z (Critical) two-tail	1.991	

Source: Field Survey, 2016

4. Conclusion

The study compared the marketing efficiency of plantain marketing between a rural and an urban market. The result shows that the markets were inefficient since the estimated efficiency values were less than 100%. Furthermore, the channel of movement of plantain in the study area was a simple channel. Variables that positively influenced marketing efficiency for both markets were education, quantity sold and` selling price; marketing experience, selling price and household size for Ndioru and Orie -Ugba markets respectively.

5. Recommendation

The study therefore recommends that factors that positively influence marketing efficiency such as education, selling price and marketing experience should be improved upon.

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