ECONOMIC ANALYSIS OF TOMATO MARKETING IN ILE-IFE, OSUN STATE, NIGERIA

*Ojedokun A. O.[1], Yesufu O. A.[2] Ayorinde V. A.[2] and Ogunmola O. O.[3]
[1]Department of Agriculture, Lagos State University, Epe Campus, Nigeria
[2]Department of Agricultural Economics, Obafemi Awolowo University, Ile-Ife
[3]Department of Agricultural Economics and Extension, Bowen University, Iwo,
Email: adifferentpiece@gmail.com, Corresponding author: Ojedokun A. O.

ABSTRACT

This study was conducted to analyse the economics of tomato marketing in Ile-Ife, Osun State, Nigeria. Primary data were collected from a total of 100 tomato marketers using multistage sampling technique. The data were analysed using descriptive statistics, gross margin analysis and multiple regression analysis. The study revealed that the mean age of tomato marketers was 43 years and that tomato marketing was female-dominated. The cost and return analysis showed that tomato marketing in Ile-Ife, Osun State is marginally profitable. The result also revealed marital status, household size, marketing experience, selling price and transportation costs as the factors influencing gross margin of tomato marketers. The study therefore recommended that adequate transportation should be provided for tomato marketers to reduce marketing costs and necessary pricing policies should be put in place.
Keywords: Economic, Tomato, Marketing, Determinants, Ile-Ife

INTRODUCTION

Tomato (*Solanum lycopersicum*) is one of the most important vegetables which supplies vitamins, minerals and fibres to those who consume it and as well contains antioxidants for cancer prevention especially those of the prostate gland, lungs and stomach. It is widely accepted and commonly used in a variety of dishes as raw, cooked or processed products more than any other vegetable and is also economically important, generating employment both at the urban and rural levels (Adugna, 2009).

Tomato is cultivated almost throughout Nigeria on an estimated total annual production of 1.7 million tonnes cultivated on 1 million hectares of land and an average yield of 20 – 30 tons/hectare (Adenegan and Adeoye, 2011; YISA, 2013) and it makes up about 18 per cent of the average daily consumption of vegetables in Nigerian homes (Chidi, 2012). In fact, Nigeria is ranked as the second largest tomato producer in Africa and thirteenth in the world; yet, Nigeria continues to import tomato paste from China and Italy in large quantity making her the largest importer of these products (YISA, 2013).

Furthermore, the marketing of tomato which is a horticultural crop is unlike cereals and grains and as such it is more complex and risky because of its special characteristics which relate to its highly perishable nature, seasonality and bulkiness and as such needs special care. As a result, the supply of tomato – an important vegetable is subjected to various problems including wide fluctuation in prices. Despite the fact that tomato production is a viable option to increase farm income and hence alleviate widespread poverty, considerable attention has not been given to its marketing aspects (Adenegan and Adeoye, 2011).

Furthermore, due to the imbalance in distribution system and lack of organized marketing system, there is always a market glut of tomato in main production season and scarcity of the commodity in other seasons which has continued to have a negative effect on the pattern of supply but has continued to decrease the profit of marketers. Similarly, price instability resulting from seasonal fluctuations in production as well as poor supply chain management have continue to reduce the

margin of profit of marketers (Adenegan and Adeoye, 2011; Sanusi and Dada, 2016), hence the need for this study. It is against this backdrop that this study estimated the costs and return to tomato marketing and determined the factors affecting the gross margin of tomato marketers in Ile-Ife area of Osun State, Nigeria.

H_{01}: No socio-economic characteristics of respondents significantly influence the gross marketing margin of tomato marketers.

MATERIALS AND METHOD
Study area
This study was conducted in Ile-Ife, Osun State which is one of the major towns in the State where tomato marketing is predominantly carried out by marketers. A multistage sampling was used in selecting respondents. The first stage involved a sampling of all major markets in Ile-Ife while the second stage involved a random selection of 100 respondents from all the major markets. Thus, a total of 100 marketers were sampled. Primary data were collected using pretested structured questionnaire. Data on socio-economic characteristics such as age, level of education, household size, marital status, selling price, purchase price amongst others were collected.

Method of Data Analysis
Various analytical tools and procedures were employed for this study. Descriptive statistics such as percentages, frequencies and means were employed to explain the socio-economic characteristics of the respondents; Budgetary analysis was used to determine the gross marketing margin of tomato

marketers while multiple regression was used to determine the factors that affected gross margin of tomato marketers.

Budgetary Technique

Budgetary technique was employed to determine the gross marketing margin of tomato marketing. The various costs were identified. Gross marketing margin measures the difference between selling price and purchased price. The selling price is obtained by multiplying the unit price of each basket of tomato by the quantity sold while the purchased price is obtained by multiplying the cost of each basket of tomato by the quantity purchased. The variable costs are those costs that vary with the total level of output and they include the cost on offloading/loading, association levy, agent fee as well as transportation. The addition of total variable costs and total fixed costs gives the tomato marketing costs incurred. Using the straight line method, the depreciation expenses were calculated on the fixed items which were then used in the analysis. The equations are:

$$SP = P_i \times Q_i \tag{3.1}$$

$$PP = C_i \times Q_i \tag{3.2}$$

$$TMC = TVC + TFC \tag{3.3}$$

$$GMM = SP - PP \tag{3.4}$$

Where: GMM is Gross Marketing Margin, TMC is the Total Marketing Cost, TVC is total variable cost, TFC is the total fixed cost, SP is the Selling Price, PP is the Purchased Price, C_i

is the cost of tomato per unit of basket, P_i is the price per unit of basket of tomato and Q_i is the per unit quantity of tomato basket sold.

Regression model

To identify the factors influencing the gross margin of tomato marketing, a multiple regression was used. The dependent variable was the computed gross margin for each marketer. A number of explanatory variables were identified and included in the model. The implicit function is given as:

$Y = f(X_1, X_2, X_3, ---, X_{10})$

Where;

Y = Gross Marketing Margin;

X_1 = Age of tomato marketer (Years);

X_2 = level of education (1 = formal, 0 = otherwise);

X_3 = Household size (Number);

X_4 = Marketing experience (Years);

X_5 = Marital status (1 = married, 0 = otherwise);

X_6 = Primary occupation (1 = tomato marketing, 0 = otherwise);

X_7 = Purchase price (₦);

X_8 = Selling price (₦);

X_9 = Transportation cost (₦);

X_{10} = Frequency of purchase (number of times per week);

X_{11} = Quantity purchased (actual purchased);

X_{12} = Source of capital (1 = personal savings and 0 = otherwise);

e = Error term.

Different regression functions like linear, exponential, semi-log and Cobb-Douglas were used. Out of the regression functions used, the Cobb-Douglas regression function was adopted as the lead equation based on the highest coefficient of determination (adjusted R^2), with the highest F-statistics,

number of significant variables and the signs of the estimated coefficients.

RESULTS

Table 1: Distribution of respondents by their socio-economic characteristics

Socioeconomic characteristics	Frequency	Percentage	Mean (Standard deviation)
Age			
25 – 34	17	17.0	
35 – 44	40	40.0	43.14
45 – 54	30	30.0	(8.77)
55 – 64	13	13.0	
Gender			
Female	100	100.0	
Marital status			
Single	2	2.0	
Married	90	90.0	
Divorced	1	1.0	
Divorced	7	7.0	
Level of education			
No formal education	8	8.0	
Primary education	20	20.0	
Secondary education	66	66.0	
Tertiary education	4	4.0	
Quranic education	2	2.0	
Source of capital			
Personal savings	75	75.0	
Friends and family	4	4.0	
Cooperative societies	17	17.0	
Money lender	4	4.0	
Household size			
1 – 5	45	45.0	5.8
6 – 10	51	51.0	(8.1)
11 – 15	4	4.0	
Marketing experience			
1 – 10	43	43.0	
11 – 20	42	42.0	14.23

21 – 30	13	13.0	(8.11)
31 – 40	1	1.0	
41 – 50	1	1.0	
Primary occupation			
Tomato marketing	99	99.0	
Farming	1	1.0	
Frequency of			
purchase	19	19.0	
Daily	9	9.0	
Once in a week	46	46.0	
Twice in a week	24	24.0	
Thrice in a week	2	2.0	
Four times in two weeks			
Membership of			
cooperatives	99	99.0	
Yes	1	1.0	
No			

Source: Field Survey, 2018

Table 2: Gross Margin analysis of tomato marketing per marketer per month

Item	Price/basket	Quantity/basket	Total
A. Selling Price (SP)	9200	51	**469,200**
B. Variable costs			
(VC)	7600	54	410,400
Purchase Price (PP)	100	54	5,400
Loading/offloading	100		100
cost	90	7	630
Association levy	130	3	390
Nylon (small)	300	54	16,200
Nylon (big)	500	54	27,000
Agent fee			**460,120**
Transportation costs			
Total Variable Costs			
(TVC)			
C. Fixed costs			
Rent on space			560

Depreciation costs on tools (basket, bowl, umbrella, lambebe, stall, table, opon, stool, bench)	173.5848
	733.58
Total Fixed Costs (TFC)	
D. Total Marketing Cost (TVC+TFC)	460,853.58
E. Gross Marketing Margin (A – B)	9,080
F. Marketing Profit (SP – TMC)	8,346.42
G. Marketing margin $(SP - PP)$	58,800
H. Benefit-cost ratio $\left(\frac{A}{D}\right)$	1.01811078

Source: Data Analysis, 2018

Table 3: Factors influencing gross margin of tomato marketing

Variable	Coefficient	Standard error	t
Age	-1.022	1.504	-0.68
Marital status	-2.546**	0.998	-2.55
Household size	-1.795***	0.676	-2.66
Source of capital	0.052	0.371	0.14
Level of education	-0.120	0.623	-0.19
Primary occupation	1.485	2.631	0.56
Marketing experience	1.393**	0.583	2.39
Frequency of purchase	-0.365	0.409	-0.89
Purchase price	-6.568	4.109	-1.60
Selling price	10.530***	3.889	2.71
Transportation cost	-0.787***	0.109	-7.24
Quantity purchased	0.301	0.247	1.22
Constant	-11.734**	5.767	-2.03
R-squared	0.6624		
Adjusted R-squared	0.5703		
F	11.95***		

Source: Data Analysis, 2018

DISCUSSION

Socio-Economic Characteristics of Tomato Marketers

The result from Table 1 indicated that the majority (70.0%) of the sampled marketers were between the ages of 35 and 54 years with a mean age of approximately 43 years and standard deviation of ±8.77 years. This shows that tomato marketing is dominated by middle-aged marketers who are very much active. This is similar to the studies by Camillus *et al.*, (2014) and Haruna *et al.*, (2012) who found out that fresh tomato marketers are relatively young and active to engage in marketing. The result also showed that all the respondents interviewed were female which indicates that tomato marketing is a female-dominated enterprise. This corroborates the study by Adejobi *et al.* (2011) who reported that tomato marketing is predominantly female dominated. The result also revealed that majority (90.0%) of the marketers were married with a mean household size of approximately 6 persons. This corroborates the findings of Obayelu *et al.*, (2014) who also found out that majority of tomato marketers in their study are married and had a household size of approximately 6 persons.

The result in Table 1 also showed majority (92.0%) of the marketers as literates who can read and write. This result conforms to the study by Camillus *et al.*, (2014) who also found out that the majority of the marketers interviewed for their study were literates. The result further showed that the mean years of experience of marketing was approximately 14 years and that majority (75.0%) of the marketers source their capital from their personal savings which shows that there is little assistance from other sources. Findings also revealed that majority (99.0% and 99.0%) of those interviewed were primarily tomato marketers and belong to a cooperative society

respectively and that majority (70.0%) of the marketers purchased tomato for sale twice or thrice in a week.

Cost and returns to tomato marketing

The cost and return to fresh tomato marketing is shown in Table 2. The result revealed that a tomato marketing cost of ₦460,853.58 was incurred by an average marketer and that an average of 54 baskets and 51 baskets were purchased and sold per month respectively. The average purchase and selling price per basket was ₦7,600 and ₦9,200. The Table revealed that a gross margin and marketing profit of ₦9,080 and ₦8,346.42 were realized respectively and that the return on capital invested was ₦1.02 indicating that the enterprise is marginally profitable. This is because for every ₦1 invested in the business, a return of ₦0.02 was realized.

Determinants of Gross Margin of Tomato Marketers

The summary of the parameter estimates for the factors influencing the gross margin to tomato marketing is presented in Table 3. Based on the R-squared value, F-ratio and the number and signs of significant variables, the Cobb-Douglas functional form was chosen as the lead equation. The model showed that the independent variables accounted for 66.24% of the variation in the gross margin to tomato marketing. Of the twelve variables considered for the analysis, only five variables were significant. The result revealed that the coefficient of marital status was negative and statistically significant at 5 per cent implying that the more the married, the lesser the gross margin realized from tomato marketing. Similarly, the coefficient of household size was negatively significant at 1 per cent which indicates that the more the members within a household, the lesser the gross margin that

will be realized by tomato marketers. The negative relationship observed between marital status and gross margin on one hand and household size and gross margin on the other hand might be due to the fact that the marketers have more responsibilities to cater for.

Furthermore, the result showed that the coefficient of marketing experience was positively significant at 5 per cent which implies that the more the experience acquired, the higher the gross margin realized by tomato marketers. This could be because the number of years acquired in marketing would have increased their knowledge vis-à-vis the marketing of tomato. This result corroborates the findings of Obayelu *et al* (2014) who found a positive relationship between marketing experience and profit made. The coefficient of selling price was also positively significant at 1 per cent. If the selling price per unit increases, the quantity that will be sold by marketers is bound to increase, ceteris paribus. Lastly, the coefficient of transportation cost was negatively significant at 1 per cent which implies that an increase in the cost of transportation will lead to a decrease in the gross margin to tomato marketing. This result corroborates the findings of Obayelu *et al* (2014) who found a negative relationship between transport cost and profit made by tomato marketers. The null hypothesis of no socioeconomic characteristics affecting gross margin is hereby rejected.

CONCLUSION AND RECOMMENDATION

The study was conducted to analyse the economics of tomato marketing in Ile-Ife, Osun State, Nigeria. The study concluded that tomato marketing in Ile-Ife is marginally profitable and that the factors which influenced gross margin to tomato

marketing were household size, marital status, purchase price, marketing experience and transport cost. Based on the findings, the following recommendations were made: adequate transportation should be provided by government and the existing roads should be refurbished to minimize transportation costs. Also, since selling price is one of the determinants of gross margin, there is a need for the policy makers to make necessary pricing policies, this is because the selling price have an effect on the price that will be paid by consumers as well as those that will be received by the sellers.

REFERENCES

Adejobi A. O., Babatunde R. O. and Idowu E. O. (2011). Weight and Measurement   Issues in Retail Marketing of Fresh Tomatoes: Evidence from Osun State,   Nigeria. *ARPN Journal of Agricultural and Biological Science*, 6(4): 20 – 26

Adenegan K. O. and Adeoye I. B. (2011). Price Analysis of Tomato in Rural and   Urban Retail Markets of Oyo State. *International   Journal   of   Agricultural Economics and Rural Development*, 4(2): 90 – 96

Adugna, G. T. (2009) Analysis of fruit and vegetable market chains in Alamata,   Southern Zone of Tigray: the case of   onion,   tomato   and   papaya. www.eap.gov.et/sites/default/files/analysis%20of%20fruit%20and%20vegetable%20market%20chains%20in%20alamata.pdf.

Camillus A. W., Mensah S. O., Ayogyam A., Asare-Kyire L. and Anthony Z. K. (2014). Economics of Tomato Mareting in Ashanti Region, Ghana. *RJOAS*, 2(26): 1 – 11

Chidi, A. (2012). Tomato, nutritious vegetable. Seventeen Nigerian Economic Summit. Manufacturing today Nigeria. Alafrican post web team. Pp1-3.

Haruna, U., Sani, M. H., Danwanka, H. A. and Adejo, E. (2012). Economic analysis of fresh tomato marketers in Bauchi metropolis of Bauchi State, Nigeria. *Nigerian Journal of Agriculture, Food and Environment*; 8(3):1 – 8

Obayelu A. E., Arowolo A. O., Ibrahim S. B. and Croffies A. Q. (2014). Economics of Fresh Tomato Marketing in Kosofe Local Government Area of Lagos State, Nigeria. *Nigerian Journal of Agricultural Economics*, 4(1): 58 – 67

Sanusi M. M. and Dada O. D. (2016). Profitability Analysis of Marketing Tomato in Odeda Local Government Area of Ogun State, Nigeria. *Ife Journal of Agriculture*, 28(2): 91 – 101

Scarborough, V. and Kydd, J. (1992). Economic analysis of agricultural markets: A manual, Vol. 5. United Kingdom: Chatham.

Youth Initiative for Sustainable Agriculture (YISA) (2013). Yoccap tomato project value chain. Abuja, Nigeria. www.yisanigeria.org/tomatoes.html.