

## Full Length Research Paper

# Economic Analysis of Date Palm Marketing in Jigawa State, Nigeria

Musa, Salihu

Department of Agricultural Economics and Extension, Federal University, Dutse, Jigawa State, Nigeria

Correspondence Author: Email: [bappa.girei@gmail.com](mailto:bappa.girei@gmail.com) Tel: +2348034442807

Accepted 17 November, 2022

The study examined the economic analysis of date palm marketing in Jigawa state, Nigeria. Data were collected through questionnaires distributed to 122 sampled date palm marketers for both wholesalers and retailers. Purposive and simple random sampling techniques were employed in selecting the sample size while simple frequencies, percentages, means, gross margin analysis and truncated regression model were employed for the study. About 94.23% and 100% were retailers and wholesalers respectively between the ages of 21-50 years with 88.87% and 100% were married respectively. About 57.69% and 33.33 of retailers and wholesalers had one form of formal education or the other and 59.62% and 55.56% of retailers and wholesalers sourced their supply from wholesalers respectively. The truncated regression revealed that the coefficient of cost of transportation (0.342) and taxes (88.82) had a negative relationship with gross margin while years of formal education (0.0213), household size (0.0223) and quantity sold (40.8413) had a positive relationship with gross margin for retailers. The coefficients of cost of transportation (0.1252), cost of loading and offloading (3.26), cost of commission agents (0.0007) and cost of threading (0.1004) had a negative relationship with gross margin while quantity sold (104.5665) had a positive relationship with gross margin for wholesalers. Hat-square value of 0.72 and 0.79 for retailers and wholesalers respectively indicates that the models were well specified and VIF of 1.58 and 6.25 respectively indicate the absence of multicollinearity and the Wald chi-square of 634.76 and 759.38 indicates the variables were jointly affecting gross margin. In conclusion, marketers of the date palm are profitable and marketers were married males with one form of education or the other and only cost of transportation reduces profitability for both categories.

**Keywords:** Marketing, Date palm, Truncated regression, Analysis and Jigawa State.

## INTRODUCTION

Date palm is a widely distributed species occurring in different geographic, soil and climate areas (El-Harami *et al.*, 2011). Although date palm has been established in America particularly in places like California, Arizona and Mexico, most of the trees are located in the Middle East and North Africa (Dayang *et al.*, 2014). Moreover, the crop requires high temperature and low relative humidity for optimal development of pollen and fruit setting and ripening respectively and it also requires a large quantity of water drawn from deep soil through irrigation. In Nigeria date, palm plantations started as far as the 17<sup>th</sup> century but the Nigerian date palm industry is characterized by lack of awareness of the nutritional

benefits of dates (Abdul-Qadir *et al.*, 2011).

In Nigeria, the expected role of supplying raw materials for industries, providing employment, generating foreign exchange, and ensuring food security was not fully performed by the date in the palm industry (Dada *et al.*, 2012). Moreover, all activities regarding date palm are restricted within production and sale. Okolo *et al.* (2000) stated that date palm thrives in the Northern parts of the country, especially in areas where the latitude is above 10° north of the equator. The date palm is essentially cultivated for its edible fruits with high nutrition, energy and a high value economic tree that produces 10-75kg of fruit per annum for a matured female which yields

economic returns of about 200,000/ha/year (Ataga *et al.*, 2012)

The date palm fruit and trunk of date palm are utilized in local industries, which supply packing materials for local marketing of fruits and vegetables as well as for many other uses. The tree and fruit by-products offer an extra income (Hassan *et al.*, 2006). Various parts of the date trees have been used for the preparation of animal feed, construction materials, household goods, and paper (Anwar, 2006). The trunk of a date tree is usually used to erect bucolic houses (roofs). Because it is a wood of poor quality from which no plates can be produced, it is often used for a wood veneer or combustion. The leaves are important to the production of paper and cartons. The fruit captures seed and pulp. The seed (Endosperm) contains 65% Hemilloze, 7% oil, 6% protein, enzyme Cytoze and Pulp. The Fruit is a fleshy, one seeded berry of a long, egg-like, seldom round Shape (Al-Gboori and Krepl, 2010).

Dates are consumed as high energy food useful in cases of fatigue and are the main source of income in irrigated deserts. The high sugar content, vitamins and minerals in date fruit make it more useful to the younger generations, pregnant women and lactating mothers (Heiman, 1983; George *et al.*, 2005).

Marketing assists in providing income at the local, state, and national levels, it is also aimed to providing support to producers and helps them increase production by adopting new and improved technologies. Moreover, any development in the volume of trade characterized by enhanced marketing will generate the government further support by providing basic amenities such as roads, infrastructures, and water storage facilities, etc. which will finally improve marketing efficiency (Olukosi *et al.*, 2012). The allocation trade sector provides interference assistance between the upstream and downstream economic agents that is producers and consumers. Consequently, it affects the functioning of the market economy in totality and is particularly important to monetary policy because of its vital role in price formation.

Over the years, the marketing of agricultural produce in Nigeria particularly date palm has not been given the due attention that it requires. It is only recently that a few studies like Omoti and Okolo (2000); Ata (2011); Mani (2014); Hamidu (2014); Obadimu and Obadimu (2015) have been done on date palms. However, most of these studies have focused on the production and were limited to a specific area of marketing. Systematic and adequate information on the process of market concentration and efficiency in date palm marketing is not well identified. Marketers of the date palms in Jigawa state were constrained by reliable market information, lack of potential exchange partners, infrastructural facilities, institutional and instruments to manage price and other risks which undermined their potentiality and growth.

Yet it is known that proper marketing systems provide incentives to farmers and traders to earn more. On the other hand, date palm concentration and efficiency are important factors to considering alternative market opportunities. The problem therefore identified on marketing at which traders use resources on these markets and how the various factors that explain efficiency, concentration, and marketing in these systems can be examined so as to improve date palm marketing in the state and the country in general.

The main problems of dates involve lack of improved varieties, bad farm management, inability to control and manage pest and diseases, proper harvesting, marketing and processing and low number of qualified staff involved in research and development. In order to solve these problems ecological groups are encouraging biological production which is ecologically pleasant approach and were discouraging conservative system. There is a lot of controversy concerning date palm producers who are engaged in converting conservative system to the modern organic system (Azadi *et al.*, 2006). The broad objective of the study was to determine the economic analysis of date palm marketing in Jigawa State Nigeria while the specific objectives were to;

- i) describe the socio-economic characteristics of respondents in the area; and
- ii) examine the influence of gross margin on some socio-economic variables of respondents in the area.

## METHODOLOGY

### Study Area

The study was conducted in Jigawa state, Nigeria which is located in the north-western part of Nigeria between longitudes 8°.00'E to 10°.15'E and latitudes 11°.00'N to 13°.00'N. The state has an estimated population of 5,828,200 people (Nigerian Population Commission NPC 2006). A majority (85%) of the population live in rural area with about 90% involved in agriculture and animal husbandry (Sanusi *et al.*, 2013). However, the people are engaged in both wet and dry season farming while the fertile soil is suitable for almost all tropical crops which enables the processing and marketing of agricultural produce around the state with weekly markets spread across all the local government areas in the state.

### Source of Data

Cross-sectional data were obtained through primary sources with the aid of a questionnaire distributed to sampled 122 date palm marketers in Jigawa state.

### Sampling Techniques

The sampling techniques employed for the study were purposive and simple random sampling techniques. Eight

**Table 1.** Sampling Technique of Date Palm Marketers in Jigawa State

Markets	Wholesalers		Retailers	
	Population	Sample	Population	Sample
Shuwarin	17	7	50	20
Babardu	7	3	53	21
Gujungu	-	-	40	16
Maigatari	10	4	28	11
Gumel	5	2	30	12
Hadejia	-	-	30	12
Kazaure	5	2	20	8
Gwaram	-	-	10	4
Total	44	18	261	104

Source: Author's Computation

markets were purposively selected due to a high number of date palm marketers in the area and 40% of the total population was selected using the simple random sampling technique from each of the markets. The sample size for wholesalers was 18 while a sample size of 104 retailers was selected from a total population of 44 wholesalers and 261 retailers making a total population of 305 and a total sample size of 122. The detailed selection is indicated in Table 1.

**Analytical Techniques**

The analytical techniques employed for the study were simple frequency, percentages; means gross margin analysis and the truncated regression model.

**Gross Margin Analysis**

Gross margin (GM) by definition is simply the difference between the total revenue (TR) and the total variable cost (TVC) (Olukosi and Erhabor, 2005) and is expressed as:

$$GM = TR - TVC \tag{1}$$

Where:

GM= Gross margin in naira of date palm per marketer per month

TR= Total revenue in naira/month

TVC= Total variable cost in naira/month

Here, the gross margin was used dependent variable which regressed against other independent variables both wholesalers and retailers.

**Truncated Regression Model**

The gross margin was used as a dependent variable used against various factors which affect gross margin as the independent variable. The gross margin (GM) was regressed on numerous factors affecting the level of profit using STATA software. Due to the presence of a negative

gross margin in the dependent variable in both retailers and wholesalers, it was necessary to run a truncated regression.

For retailers, the regression was conducted stepwise such that the highest insignificant variables which include threading cost, cost of empty bag and commission agents were removed respectively while the cost of loading/offloading and cost of the product was respectively removed due to the magnitude of signs of the variables.

The implicit form of the truncated regression for retailers can be specified as follows: -

$$GM^* = f(x_1, x_2, x_3, x_4, x_5) \tag{2}$$

Where

GM\* = Truncated dependent variable (Gross margin)

X<sub>1</sub> = Years of formal education (Years),

X<sub>2</sub> = Household size (Number of people),

X<sub>3</sub> = Transportation cost (Naira),

X<sub>4</sub> = Quantity sold (Kg),

X<sub>5</sub> = Taxes (Naira)

Therefore

$$Y_i^* = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + \mu_i \tag{3}$$

Where:

u<sub>i</sub> = Error term

β<sub>0</sub> = Intercept

β<sub>1</sub> - β<sub>5</sub> = Parameters, and

Y\* = Y If Y > 0

Where Y\* = Truncated dependent variable.

For wholesalers, the regression was conducted stepwise such that the highest insignificant variables which include

**Table 2.** Socio-economic Characteristics of Date Palm Marketers in Jigawa State

Gender	Retailer		Wholesalers	
	Frequency	Percentage	Frequency	Percentage
Male	98	94.23	18	100
Female	6	5.77	-	-
Total	104	100	18	100
Age (years)				
21-30	24	23.08	4	22.22
31-40	37	35.58	4	22.22
41-50	28	26.92	3	16.67
51-60	12	11.54	4	22.22
>60	3	2.88	3	16.67
Total	104	100	18	100
Mean	39.77		45	
Minimum	21		21	
Maximum	65		72	
Marital Status				
Married	92	88.47	18	100
Single	8	7.69	-	-
Widow/widower	3	2.88	-	-
Divorced/Divorcee	1	0.96	-	-
Total	104	100	18	100
Level of Education				
No formal	44	42.31	12	66.67
Primary	46	44.23	6	33.33
Secondary	13	12.50	-	-
Tertiary	1	0.96	-	-
Total	104	100	18	100
Source of Supply				
Farmer	13	12.50	2	11.11
Buying agent	7	6.73	4	22.22
Rural assembly	22	21.15	2	11.11
Wholesaler	62	59.62	10	55.56
Total	104	100	18	100

Source: Author's Computation

the cost of securing, taxes, years of formal education, and household sizes were removed respectively while the cost of empty bags and cost of the product were respectively removed due to the magnitude of signs of the variables.

The implicit form of the regression for wholesalers can be specified as follows: -

$$GM^* = f(x_1, x_2, x_3, x_4, x_5) \tag{4}$$

Where:

GM\* = Truncated dependent variable (Gross margin)

X<sub>1</sub> = Cost of transportation (Naira),

X<sub>2</sub> = Quantity sold (kg),

X<sub>3</sub> = Cost of loading/offloading (Naira),

X<sub>4</sub> = Commission agents (Naira),

X<sub>5</sub> = Cost of threading (Naira)

While

$$Y_i^* = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + \mu_i \tag{5}$$

Where:

u<sub>i</sub> = Error term

β<sub>0</sub> = Intercept

β<sub>1</sub> - β<sub>5</sub> = Parameters, and

Y\* = Y If Y > 0

Where Y\* = Truncated dependent variable.

## RESULTS AND DISCUSSIONS

### Gender

The gender distribution of respondents as presented in Table 2 below shows that 94.23% of the respondents were males while only 5.77% were females for the retailers' category while all (100%) respondents were

males in terms of wholesalers. This implies that men dominated date palm marketing in the area and this could be attributed to socio-cultural factors such as culture, tradition, and religion which affect women in the area. The dominance of date palm marketing by males in the study area is that in the study area women were expected to stay at home and on the farm, while men struggle for survival through such businesses, and women in the area were expected to spend their time in the house taking care of children. However, women lack exposure to businesses. This is because the business requires a lot of energy, which involves moving from one place to another for marketing. This agrees with Asogwa and Okwoche (2012) who studied the marketing of agricultural produce among rural farm households in Benue State, Nigeria and found that 77% of the respondents involved in marketing were males.

The study is in line with Okwo (2009) on the economics of farm gate rice marketing which indicates that the high concentration of males in marketing activities could be attributed to the high energy exertion required in different operations and most women are vulnerable to hard and tedious work and generally rice business is time and labour intensive thereby making it unattractive for women. However, women may be involved in businesses that are less tedious as ascertained by Osundo *et al.* (2014) indicated that the marketing of vegetables in Abia State is dominated by women. Moreover, date palm fruit is usually marketed by males and could be attributed to socio-cultural attitudes of the people in the area.

### Age

The mean age of the sampled retailers was 39.77 years with 35.58% in the age group of 31-40 years, 26.92% in the age group of 41-50 years, and 23.08% in the age group of 21-30 years, 11.54% in the age group of 51-60 years and 2.88% were in the age group of more than 60 years. The minimum age of sampled retailers was 21 years with a maximum of 65 years.

However, the mean age of sampled wholesalers was 45 years with a minimum of 26 years and a maximum of 72 years. The result revealed that 22.22% of sampled wholesalers were within the age range of 21-30 years, 31-40 years and 51-60 years respectively while 16.67% were in the age range of 41-50 years and greater than 60 years respectively. This reveals that most of the respondents were in the age group of 21-50 years for both wholesalers (61.11%) and retailers (89%) category and in their most active age, hence strong enough to participate in marketing activities. This agrees with Ata (2011) who revealed that date palm marketers belong to the young and middle-aged group, while an insignificant number of date palm marketers belongs to the old age group. It is generally believed that with the increase in age, the individual becomes mentally mature and takes

rational decisions and this can be one of the important factors affecting the marketing behaviour of respondents. The implication is that date palm marketing in the study area was patronized by young people who are strong enough to cope with the stress involved in the business and within the age by which people are innovative and active in the business. This conforms Afolabi (2009) and Farayola *et al.* (2013) indicating that the majority of the respondents belong to the active segment of the population while the remaining belongs to the aged group.

### Marital Status

The results in Table 2 indicate that most (88.47%) of the sampled retailers were married while widow/widower and divorced/divorcee accounted for 2.88% and 0.96% respectively and single accounted for 7.69%. And for the sampled wholesalers, all (100%) of the respondents were married. The result shows that there are more married people in date palm marketing than those that are single, divorced and widow/widower. This may be as a result of more family responsibilities such as feeding, health care and education of the children while single producers faceless responsibility. Furthermore, the predominance of married people in the business could be explained by the fact that large family sizes may provide a much cheaper source of labour force. The alligns with Hamidu (2014) who studied the socio-economic characteristics and returns of date palm marketing in Gombe State, Nigeria which disclosed that 72.5% of sampled date palm marketers in the study were married.

Kabiru *et al.* (2016) conducted a study on the assessment of the knowledge level of date palms in Dutse Local Government Area of Jigawa State, Nigeria also found about 99.1% of the respondents were married with the remaining 0.9% as a widower. Another study that coincides with this study is a study conducted by Mubi *et al.* (2013) on marketing which also indicated that most (66%) of the respondents were married with only about 27% single. This could be attributed to the necessity of catering for family responsibilities.

### Level of Education

Level of education of respondents presented in the (Table 2) which indicated that 42.31% of the sampled retailers had no formal education, 44.23% had primary education, 12.50% had secondary education and 0.96% had tertiary education while 66.67% of sampled wholesalers had no formal education and 33.33% had primary education.

The study revealed that the majority (57.69%) of the retailers had one form of formal education or the other, hence are expected to have the required knowledge and skills to enhance their marketing activities. However, a

majority (66.67%) of sampled wholesalers had no formal education which indicates that the majority (57.69%) of sampled retailers acquired one form of formal education or the other more than the sampled wholesalers (33.33%). This agrees with the study of Hamidu (2014) which indicated that date palm marketers in Gombe had one form of formal education or the other. This is supported on the basis that education affects the way farm business is managed as well as overall production (Nkang *et al.*, 2009).

Education is mostly associated with understanding the benefits associated with taking a risk, and this can only be understood through education which makes the risk to be undertaken by most educated people and serves as an essential tool in the adoption of new policies (Asogwa and Okwoche, 2012). The process of bringing about changes in human behaviour is education. To bring positive changes in an individual, education is the main relevant ingredient.

### Source of Supply

The results in Table 2 below revealed that 59.62% of the retailers sourced their date palm from wholesalers, 21.15% from the rural assembly, 11.5% source their product from the farmer and only 6.73% from buying agents. However, 11.11% of sampled wholesalers sourced their date palms from farmers and rural assemblies respectively, while 22% sourced their date palm from buying agents and 55.56% sourced their date palms from other wholesalers. This is an indication of the low productivity of date palms in the area despite the presence of a date palm sub-section by the Federal Government under the National Institute of Oil Palm Research (NIFOR).

However, this could be attributed to why date palms are imported in large quantities from neighbouring countries like Niger and Chad. Purchasing directly from the farmer will reduce marketing costs, hence will reduce exploitation by the middlemen. This was supported by the fact that commission middlemen enjoy the overall benefit in the entire marketing channel because the buyer pays another price known as commission apart from the actual purchase price which is the commission for the selling agents (Olukosi *et al.*, 2012).

This was further elaborated by Omoti and Okolo (2000) that Nigeria has two growing seasons in a year which has given the country more advantages to produce date palm in commercial quantity than other countries with only one growing season in a year, yet the country is still constrained by producing at subsistence level thereby making production not matching with consumption mainly because most of the date palm consumed in the country is imported from neighbouring countries especially Niger, Chad and Sudan. The quantity of fresh produce produced and marketed is substandard and inconsistent, and the

post-harvest wastage rates are high, thus creating problems for the marketing system. In theory, prices are an important incentive in determining the supply of agricultural commodities in markets and producer rationality to raise the supply to the market is mainly driven by the projected level of earnings. Conversely, low producer prices result in low market supply driven by prices offered in the destination markets (McCulloch and Ota, 2002).

### Truncated Regression Results of Retailers

The regression analysis of retailers was obtained through stepwise analysis such that in the first step, the cost of threading was removed because it the insignificant with the highest probability level (0.884) of the z statistics. In the second step cost of the empty bag was removed with a 0.737 probability level as the insignificant variable with the highest probability and the cost of securing was removed with a 0.52 probability level in the third stage while the cost of leather was removed with a 0.439 probability level in the fourth step and the cost of commission agents was removed in the fifth step with 0.382 probability level.

In the sixth step of the regression, all the variables were significant at a 0.05% probability level, but the magnitude of signs indicates a positive relationship between gross margin and cost of the product and between gross margin and the cost of loading and offloading. The theoretical expectation is a negative relationship between gross margin and costs. Therefore, cost of loading and offloading was removed with a 0.028 probability level in the sixth step, and cost of the product cost was removed in the seventh step with a 0.000 probability level. In the 8<sup>th</sup> step, all the variables in the model were significant with the correct magnitude of signs which produced the desired result.

Also, the Variance Inflation Factor (VIF) was used to test for multicollinearity at ( $p < 0.05$ ) probability level. The VIF mean value of retailers was 1.58 which indicated that all the independent variables in the model are not collinear for retailers because the mean VIF value is less than 10. The insignificance of the hat-square value of retailers (0.72) indicated that the model is well specified which was tested at  $p < 0.05$  probability level. The Wald chi-square of 634.76 retailers and wholesalers measure the joint significance of the parameters and was found statistically significant ( $p < 0.05$ ) as indicated by its probability value, this implies that all the variables of the model are jointly, statistically and significantly affecting gross market margin as indicated in Table 3.

Based on the truncated regression of retailers, the results showed that there is a positive and significant relationship between gross margin, years of formal education, household size and quantity sold while there is a negative and significant relationship between gross

**Table 3.** Truncated Regression Analysis of Sampled Retailers

Variables	Coefficient	Standard error	z. statistics
$X_1$ (Years of formal education)	0.02122271	0.0089453	2.37*
$X_2$ (Household size)	0.0223834	0.0048536	4.61*
$X_3$ (Cost of transport)	-0.0342319	0.0076288	-4.49*
$X_4$ (Quantity sold)	40.84127	3.635811	11.23*
$X_5$ (Taxes)	-88.81526	34.07523	-2.61*
C (Constant term)	-0.1233431	0.0798379	-1.54
VIF mean value	1.58		
Hat-square value	0.72		
Wald chi-square value	634.76*		

**Source:** Author's Computation

\* = Indicates significance at 5% probability level.

market margin, and cost of transportation and taxes as indicated by the z-statistics which was tested at 5% probability level. One-naira increase in the cost of transportation will reduce the gross market margin by about ₦0.342/kg for retailers while a one-naira increase in taxes will reduce the gross margin by 88.82/kg. This is in line with Afolabi (2009) who found that all estimated coefficients were positive except the coefficient of transportation which denotes that an increase in transportation cost will reduce profitability. The study is in line with Obadimu and Obadimu (2015) who found a negative relationship between the cost of transportation and profit from the date palm retail market. A one-year increase in years of formal education of retailers will increase gross margin by about ₦0.0213/kg. This indicates that the more educated a marketer more efficient he will be carrying out marketing decisions.

A one-unit increase in the household size of retailers will increase gross margin by about ₦0.0223/kg. The number of a household could assist in marketing activities like bagging, threading and selling date palms. A unit increase in quantity sold by retailers will increase gross market margin by about ₦40.8413 which is per theoretical expectation because the quantity sold by marketers the more sales and hence profitability. This agrees with the study conducted by Craig and Cris (2006) who posited that an increase in the quantity of a commodity in marketing increases the income of a marketer.

### Truncated Regression Analysis of Wholesalers

The truncated regression of wholesalers was conducted stepwise whereby insignificant variables were removed sequentially based on the insignificance of the variables and the magnitude of signs of the variables. In the 1<sup>st</sup> step cost of securing was removed because it was the insignificant variable with the highest probability level (0.966) while the 2<sup>nd</sup> step lead to removal of taxes as insignificant variable with highest probability level of

0.891 and years of formal education was the 3<sup>rd</sup> variable removed with the 0.465 probability level. Household size was removed as the 4<sup>th</sup> variable because it is insignificant at a 0.08 probability level while the cost of leather was removed with a probability level of 0.123. The 5<sup>th</sup> variable removed was the cost of an empty bag because of the positive sign of the coefficient of 0.00665 and the cost of the product was also the 6<sup>th</sup> variable removed because of a positive sign (0.30776) of the coefficient.

Also, the Variance Inflation Factor (VIF) was used to test for multicollinearity at ( $p < 0.05$ ) probability level. The VIF mean value of wholesalers was 6.27 which indicated that all the independent variables in the model are not collinear for wholesalers because the mean VIF value is less than 10. The insignificance of the hat-square value of wholesalers (0.79) indicated that the model is well specified which was tested at  $p < 0.05$  probability level based on the link test. The Wald Chi-square of 759.38 for wholesalers measures the joint significance of the parameters and was found statistically significant ( $p < 0.05$ ) as indicated by its probability value, this implies that all the variables of the model are jointly, statistically and significantly affecting gross market margin as indicated in the (Table 4).

Wholesalers indicated a positive and significant relationship between gross margin and quantity sold and a negative and significant relationship between gross margin and cost of transportation, cost of loading and offloading, commission agent and cost of threading as indicated by the z-statistics which was tested at 5% probability level. One-naira increase cost of transportation will reduce the gross margin by about ₦0.1252/kg, one-naira increase in the cost of loading and offloading will reduce gross margin by ₦297.4144 which is about ₦3.26/kg and one-naira increase in the cost of commission agents will reduce gross margin by ₦0.0007/kg and one-naira increase in cost of threading will reduce gross margin by 0.1004. A One-unit increase in quantity sold by wholesalers will increase the gross margin by ₦104.5665/kg as shown in Table 4. This

**Table 4.** Truncated Regression Analysis of Sampled Wholesalers

Variables	Coefficient	Standard error	z. statistics
$X_1$ (Cost of transportation)	-0.1252064	0.0256507	-4.88*
$X_2$ (Quantity sold)	104.5665	7.111966	14.70*
$X_3$ (Loading/offloading)	-297.4144	68.71922	-4.33*
$X_4$ (Commission agents)	-0.0007554	0.0001262	-5.99*
$X_5$ (Cost of threading)	-0.3521715	0.0086528	-11.61*
C (Constant term)	0.3521715	0.1549686	2.27
VIF mean value	6.27		
Hat-square value	0.79		
Wald chi-square value	759.38*		

**Source:** Author's Computation

\* = Indicates significance at 5% probability level.

indicates that quantity is highly related to the gross margin more than all the variables captured by the model.

## CONCLUSION

In conclusion, the marketing of date palms is dominated by males who were married and by their most active age, hence strong enough to participate in marketing. Both categories of marketers had one form of formal education or the other and had sourced their supply of date mainly from wholesalers. For retailers as years of experience, house size, quantity sold and cost of production increase with an increase in profit while the increase in the cost of transportation reduces profit. However, in the wholesalers' category, an increase in years of household size, quantity sold, marketing cost, and the cost of the produce increases the profit of date palm marketers while the cost of transportation also reduces profit. It is also concluded that the model is well-specified with all independent variables not collinear to each other for both categories. Based on the result, the following recommendations were made

- i) Cost of transportation reduces gross margin, hence profitability. Marketers are advised to make a bulk purchase since purchasing in bulk will reduce their transportation costs.
- ii) Marketers should also engage in date palm farming to ensure a constant supply since seedlings are available and affordable in (NIFOR) Dutse, Jigawa State.

## REFERECES

- Abdul-Qadir IM, Garba ID, Esegibe E, Omofonmwan EI (2011). Nutritional Components of Date palm and it's Production Status in Nigeria. *Int. J. Agric. Econ. Rural Dev.* 4 (2): 83-89.
- Afolabi JA (2009). An Assessment of Gari Marketing in South-Western Nigeria. *J. Soc. Sci.*, 21(1), 33-38.
- Al-Gboori B, Krepl V (2010). Importance of Date Palms as a Source of Nutrition. *Agricultura Tropica Et*

- Subtropica. Review Articles.* 43 (4), 341-347.
- Anwar MA (2006). *Phoenix dactylifera* L.: A Bibliometric study of the Literature on Date Palm. *Malaysian J. Lib. Info. Sci.*, 11(2): 41-60.
- Asogwa BC, Okwoche VA (2012). Marketing of Agricultural Produce among Rural Farm Household in Nigeria. The Case of Soghum Marketing in Benue State *Int. J. Bus. Soc. Sci.*, 3(13): 269-277.
- Ata S (2011). A Study of Date Palm Market Chain and its Role in Food Security and Livelihoods of Farmers in South Punjab: Unpublished Master's Thesis: Department of Agricultural Extension. Faisalabad, Pakistan. pp 1-99.
- Ataga CD, Mohammed AH, Yusuf AO (2012). Status of Date Palm (*Phoenix dactylifera* L.) Genetic Resources in Nigeria. *Int. J. Life Sci. Pharm. Res.*, 2(2), 46-51.
- Azadi H, Hosseininia GH, Azadi M (2006). North-South GM Crops Transfers and Organic Farming: The Question of Food Security in South Countries'. Paper Presented at the International Conference of Economics of Poverty, Environment and Natural Resource Use, 17-19 May 2006, Wageningen, The Netherlands.
- Craig RW, Cris W (2006). *Managerial Economics*. Fourth Edition by Asoke K. Ghosh. Prentice Hall of India Private Limited. Pp 654-655
- Dada M, Nwawe CN, Okere RA, Uwubanwe IO (2012). Potentials of Date Palm Tree to the Nigerian Economy: *World J. Agric. Sci.*, 8 (3) 309-315.
- Dayang JF, Reuben CR, Raji F (2014). Nutritional Socio-economic and Health Benefits of Dates, *Int. J. Food Nutr. Sci.*, 3(6), 63-73.
- Farayola CO, Akintan OS, Yahya AA, Oni OO (2013). Determinants of Marketing Efficiency among Small-holder Cocoa Marketers in Oyo State Nigeria. *Int. J. Manage. Soc. Sci. Res.*, 2(11) 38-43.
- George D, Pamplona R, Winston J (2005). Dates, *Encyclopedia of Food and Their Healing Therapy*, 2:147-148.
- Hamidu K (2014). Socio-economic Characteristics and



- Returns of Date Palm Marketing in Gombe State, Nigeria: Agricultural Policies, Resource Economics and Agribusiness. *J. Econ. Sustain. Dev.*, 5(10):127-130.
- Hassan SK, Bakhsh ZA, Gill AM, Ahmad W (2006). Economics of Growing Date Palm in Punjab, Pakistan. *Int. J. Agric. Biol.*, 8(6): 788-792.
- Heiman EB (1983). The New Encyclopedia Britannica: The Date Palm (phoenix dactylifera L.). *Micropaedia III*: 389.
- Kabiru SM, Abiodun OC, Gafaru BO, Abdulrahman YS, (2016). An Assessment of Knowledge Level of Date Palm (*Phoenix dactylifera* L) Farmers in Dutse Local Government Area of Jigawa State, Nigeria. *World J. Agric. Res.*, 4 (2), 36-42.
- Mani JR (2014). Structure, Conduct and Performance of Date Palm Marketing in Katsina State: An Unpublished Master's Thesis, Department of Agricultural Economics and Rural Sociology. Ahmadu Bello University Zaria, Nigeria. Pp 1- 70.
- McCulloch N, Ota M (2002) Export Horticulture and Poverty in Kenya. Institute of Development Studies University of Sussex. Pp 1-33.
- Mubi AA, Michika SA, Midau A (2013). Cattle Marketing in Mubi Area of Adamawa State, Nigeria. *Agric. Biol. J. North Am.*, 4(3), 199-204.
- Nkang NM, Ajah EA, Abang SO, Edet EO (2009). Investment in Coca Production in Nigeria: A Cost and Return Analysis of three Coca Production Management Systems in the Cross River State Cocoa belt, *Afr. J. Food Agric. Nutr. Dev.*, 9, 713-727.
- National Population Commission [NPC] (2006): National Population Commission, Official Gazette 2009.
- Obadimu, OO, Obadimu, OD (2015). Marketing Performance of Dates (*Phoenix dactylifera* Linn.) among Retail Traders in North-Western Nigeria. *Int. J. Agric. For. Fish.*, 3(4):155-160.
- Okolo EC, Okwuagwu CO, Ataga CD (2005). Prospect of Date Plantation Establishment in Nigeria. *J. Agric For. Fish.*, 6(1):24-28.
- Okwo (2009). Economics of Farm Gate Rice Marketing in Enugu State, Nigeria. An unpublished M.Sc Thesis Submitted to Department of Agricultural Economics University of Nigeria Nsukka. pp 1-110.
- Olukosi JO, Erhabor PO (2005). Introduction to Farm Management Economics: Principles and Application, Second Printing. Agitab Publishers, Zaria
- Olukosi JO, Isitor SU, Moses OO (2012). Introduction to Agricultural Marketing and Prices: Principles and Application, 4<sup>th</sup> Edition, living Books Series, G.U. Publishing Abuja, Nigeria. P41.
- Omoti U, Okolo EC (2000). Date Palm Research in Nigeria: Progress and Priorities. Proceedings of the Date Palm International Symposium held in Windho, k, Namibia. 22-25 February, 2000. P351.
- Sanusi A, Apampa S, Sotinrin A (2013). Socially Inclusive Sustainable Development in Climate Stressed Northern Nigeria. A case of Jigawa State, July 2013. Pp 1-45.