

Analysis of rice marketing in ohaozara local government area of Ebonyi State, Nigeria

Udah SC, Ijioma JC and Ani M

Department of Agricultural Economics and Extension
Abia State University, Umuahia, Abia state, Nigeria

Corresponding author: christdliberator@yahoo.com

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ABSTRACT

Aim: The study was conducted to describe socio-economic characteristics of rice marketers, identify and describe the marketing channels for rice, identify the factors which influence profitability of rice marketing and identify problems encountered by rice marketing in the study area.

Materials and Methods: Purposive and multistage random sampling techniques were used to select 120 rice marketers (40 wholesalers and 80 retailers). The analytical tools used in study included descriptive statistics, multiple regression technique, flow charts and net return analysis.

Results: The majority of the wholesalers (92.5%) and retailers (83.8%) sourced their operating capital from personal savings. There was no specific rice marketing channel in the area as retailers and consumer's a time buy directly from the farmers/producers. The gross margin obtained was N34,270.8 for retailers and N116, 839.8 for wholesalers while net-return (NR) was N30,721.4 for retailers and N10,134.6 for the wholesalers. The significant determinants of rice wholesaler' net income were labour cost, transportation cost, price of rice, education level and marketing experience, while significant determinants of rice retailer' net income were labour cost, transportation cost, processing cost, educational level and marketing experience. The major problems encountered by rice wholesalers were inadequate finance, price fluctuation, low access to credit, and high transport cost as a result of poor transportation network, while inadequate finance, low access to credit, high cost of transportation and price fluctuation were the major problems encountered by the retailers.

Conclusion: It was concluded that rice marketing was determined to be a profitable enterprise to both rice wholesalers and retailers. Factors that influenced net returns of wholesalers' rice marketing includes: transportation cost, price of rice, education level, marketing experience and labour cost; while that of rice retailers are educational level, marketing experience, labour cost, transportation cost and processing cost.

Keywords: Financial institution, infrastructure, net returns, retailer.

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Introduction

Rice is popular staple food for much of the world population particularly in Asia parts of Africa and the Middle East. Rice is produced and consumed throughout the world in climates that range from temperate to tropical (NISER, 2002). However, Asia rice production accounts for nearly 90% of global rice production with two countries - China and India - accounting for over half (Congressional Research Service Report, CRSR, 2005). Currently, global output shows that the Asia continent accounts for about 92%, while America and Caribbean accounts for 5% and 3% for America (IDOSI, 2008).

Meanwhile, U.S rice production generally accounts for a very small share (less than 2%) of world production. Despite that, the United States exports nearly half of its annual production. As a result the United States is among the world's leading rice exporting nations, traditionally behind Thailand and Vietnam. India, China, Pakistan, Egypt are also important rice exporting nations.

In Africa, FAO reported that apart from Egypt and Morocco, which have attained self-sufficiency in local rice production, all other countries in Sub-Saharan Africa have rice demanding exceeding local production (Idiong, 2002). Spore 2001 reported that four of the six largest importers of rice in the world were in Africa, viz; Nigeria, Cote'diovre, Senegal and South Africa. Currently, rice is a strategic food

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security crop in Nigeria with an average per capita consumption of 24.81kg per year representing 9% of annual calorie intake of Nigerians (Bamidele *et al.*, 2010). Nigeria estimated annual rice demand was put at 5 million metric tons while annual production on average was about 2.21 tons of milled rice with deficit of 2.79 million tones bridged annually by importation (NRDS, 2009). Some factors responsible for Nigeria preference for rice include rapid rate of urbanization and its easy way of preparation. The high demand for rice in the face of inadequate supply had led to massive importation to meet the short fall which has made Nigeria to become the largest importer of rice in Africa (Daramoia, 2005).

Farmers tend to concentrate more on production, managing their production process more than they do to their marketing process. As a result, they dispose their product with little or no gain. The economic policies of developing countries in the past reflect a general tendency to consider marketing in some sense as an adjunct to the production process and only limited relevance to the main issues in economic development. Although it is a known fact that production level is still insufficient to match increasing demand of the population of the country, it is necessary that this available product be adequately distributed to consumers.

Rice is grown virtually in all the agro-ecological zones in Nigeria (Akande, 2003). This is because, Nigeria have ideal climatic conditions which is similar to that of South-East, Asia where the crop is produced for export. It has the second highest worldwide production after maize (FAOSTAT, 2010) and the third most frequently consumed in Nigeria. Rice marketing covers the performance of all business activities in the flow of paddy, milled rice from point of production to the consumer in the right place and form (Sambo *et al.*, 2005). Consequently, rice processing further differentiates rice products and markets. Rice quality is often associated with the degree of polishing (removing the hull and the bran layers) or whiteness of the grain and percent of the whole versus broken grains. Both of these attributes are highly dependent on the milling infrastructure, a market feature that the U.S. industry has used to its advantage to compete in the international markets. Parboiling rice (a process of steaming them, precooking rice, then removing the hull through abrasion) result in a

product that is preferred in certain markets (e.g. Saudi Arabia and Nigeria).

However, quality is not determined at the miller stage only. It results from combination of practices from the farm level to the retailing sport. These practices include; harvesting, threshing, winnowing, soaking, parboiling, steaming, drying, milling, polishing, storage and marketing.

Furthermore, a limited number of millers in Ohaozaa L.G.A. do not perceive any difference between the imported and local rice, or even stress the better taste of local rice. The majority of millers (56%) related the better quality of the imported rice to the processing technology used in rice exporting countries. Along the same line, the largest share (77%) of miller-traders thinks that their milling equipment does not allow them to produce local rice that could match the imported rice quality standards. Thus, a few of them point out that milling is not the only factor explaining the low quality of local rice. They refer to other aspects of the processing chain such as the inability to get cleaner rice without foreign materials.

In subsistence agriculture, every farmer grows his own food and fiber. The farm is also generally self-sufficient to input supplies. Marketing posted little problems because there were virtually no surpluses. As individuals in the society became more specialized in their economic activities; they came to rely on others for the supply of the products which they need but cannot produce (Crowford, 1989). This begins a process of exchange between buyers and sellers. This exchange process according to him is marketing. An efficient marketing system can be an important means for raising the income levels of rice farmers and increasing the consumer's satisfaction. It is imperative that the effect of marketing of rice in Ohaozara Local Government Area of Ebonyi State be empirically determined as a reference point for economic policies aimed at improving food security status of rural farm households as well as the economy as a whole. The specific objectives of the study were to describe socio-economic characteristics of rice marketers, identify and describe the marketing channels for rice, identify the factors which influence profitability of rice marketing and identify problems encountered by rice marketing in the study area.

Materials and Methods

The research was carried out in Ohaozara Local Government Area of Ebonyi State, Nigeria. The local government area is made up of three (3) autonomous communities namely; Uburu, Okposi and Ugwulangwu. Their head quarter is located in Obiozara, Uburu. It has an area of 312km and a population of 148626 (NPC, 2006). The local government lies on latitude 6° 2' 0" North and longitude 7° 46' 0" east, (EBADP, 2003). It is bounded on the North by Onicha Local Government of Ebonyi State; on the West by Ezza Local Government of Ebonyi State; on the South by Afikpo-North Local Government Area of Ebonyi State and on the East by Mpu Anini Local Government of Ebonyi State.

The soil types were dominantly sandy and loamy. The climate was rainy season between April and October and dry season between November and March. The annual temperature ranges between 21°C to 29° and humidity is relatively high. The annual rainfall varies from 2000mm to 1150mm. this climate condition helps their fruits and crops to grow very well such as papaw, pineapple, orange, pumpkin and rice.

Sampling technique

Purposive and multistage random sampling technique were used to select respondents for the study. First, two communities namely: Uburu and Okposi were purposively selected from the three communities that make-up the L.G.A. because of their degree of involvement in rice production and marketing. A list of major and minor markets in the 2 communities was formulated with the help of indigenes. Two major and two minor markets were selected randomly from the list, from each of the 2 selected communities to give 4 major and 4 minor markets. Fifteen rice marketers (10 retailers and 5 wholesalers) were randomly selected from each of the major and minor markets, to give to 120 rice marketers (80 retailers and 40 wholesalers). The retailers and wholesalers were selected based on quantity (bags) handle per month. Rice marketers who handle below 20 bags were classified retailers while those who sell above 20 bags of rice per month were classified as wholesalers.

Data Collection

Primary data was used for this study, it was obtained using structured questionnaire that was administered to the selected rice marketers. Two sets well-structured questionnaires' were used for

the producers (farmers) and marketers by personal interview method to elicit their socio-economic characteristics such as place of origin, level of education, marital status and their age. The secondary data was obtained from federal and state ministries of agriculture, journals, seminar-paper, annual reviews and reports, proceedings, textbooks, government publications, these and other published and unpublished literatures relevant to this study.

Data Analysis

Data were analyzed using descriptive statistics such as percentages, frequencies and mean; flow charts; multiple regression analysis; net-return analysis.

Model Specification

Net Margin = GM - TFC

$$Gm = \sum P_i Q_i - \sum P_{X_i} X_i, \dots\dots\dots(1)$$

Where Gm = Gross margin, TFC = Total fixed cost, P₁ = Unit price of output, P_{X_i} = Unit price of input, Q_i = quantity of each output, X_i =input (variable)

∑ = summation of

Gm = TR - TVC

In carrying out a regression analysis to actualize objective four, four (4) functional forms were tried namely: Linear, Semi-log, Cobb-Douglas and Exponential function.

The choice of the best functional form will be based on the value of R², the statistical significance of the regression coefficients, the magnitude of the F-ratio as well as their conformity to a prior expectation. The specifications of these functional forms are as follows:

1. Linear function
Y = b₀+b₁X₁+b₂+X₂.....+b_nX_n+e_i
2. Semi-log function
Y =logb₀+ b₁logX₁+ b₂logX₂...+b_nlogX_n+e_i
3. Cobb-Douglas function
Log Y = logb₀+ b₁logX₁+ b₂logX₂... +b_nlogX_n+e_i
4. Exponential function
Log Y = b₀+b₁X₁+b₂+X₂.....+b_nX_n+e_i

In all b₁-b_n were the regression coefficient

X₁ - X_n were the independent variable

b₀ is the interpret

e is the error term..

- Where Y = profitability (N)
- X₁ = Labour cost (wages/saleries N)
- X₂ = Depreciation cost (N)
- X₃ = Transportation cost (N)
- X₄ = Processing cost (N)
- X₅ = Product price (N)

- X_6 = Educational level (schooling years)
 X_7 = Marketing experience (years)
 X_8 = rent/market charges (N)
 e_i = Error term.

The need to evaluate the determinant of profit from rice marketing in the study area is obvious. Profit is an important determinant of wellness of an entrepreneur such as farmers or marketers under study. Lack of profit means lack of progress and eventual shutdown of business.

Results and Discussion

Socio-economic Characteristics of Age of the Rice Marketers

Distribution of the marketers according to age is shown (Table 1). The table shows that 30.0%, 25.0% and 22.5% of the rice retailers were within the age range of 41-50 years, 31-40 and 51-60 years respectively. While 35.0%, 25.0% and 20.0% of the rice wholesalers were within the age range of 41-50 years, 31-40 years and 51-60 years respectively. Mean age of the rice retailers was 43-84 years while mean age of the rice wholesalers was 45.36 years. It implied that both group of rice marketers in Ohaozara L.G.A of Ebonyi State were young and still active and were likely to adopt new marketing strategies for profit maximization. This finding agree with Sani *et al.* (2013) assertion that majority of marketers within the age range of 41-50 years are still in their active age and more receptive to innovations. Age is one of the factors affecting people's decision and actions made in agriculture because people's thought, behaviour and needs are primarily related to their age (Simsek and Karkacur, 1996). This result compares favourably with findings of Nwele (2016).

Educational Level of the Respondents

Distribution of respondents according to level of education was shown (Table 2). It was showed that 57.5%, 32.5% and 5.0% of the retailers had secondary school education, primary school education and tertiary education respectively. While 52.5%, 25.0% and 17.5% of the rice wholesalers had secondary school education, primary school education and tertiary education respectively. This implies that both groups of marketers are literate since only small proportion (5.0% of the retailers and 5.0% of the wholesalers) of them had no formal education. The result indicates that the marketers are literate, an advantage which according to Osondu *et al.* (2014), could translate to higher business acumen

in terms of level of profit. Ogbe (2009) and Afolabi (2009) assert that education exposes one to the right methods of utilizing resources and has positive effect on the business acumen of entrepreneurs. Thus, education makes one better positioned to take advantage of new techniques and technologies, thus, giving one an edge over competitors. This study is in agreement with the findings of Akpokodje *et al.* (2001); Akarue and Ofoegbu (2012); and Abah *et al.* (2015) that most rice marketers in Nigeria can read and write.

Marital Status of the Respondents

The distribution of respondents according to marital status was shown (Table 3). The table shows that 22.5% and 17.5% of the rice retailers and wholesalers respectively were single, while 62.5% of the retailers and 67.5% of the wholesalers were married. However, 12.5% of the retailers and 15.0% of the wholesalers were widowed. It implied that the married class dominated rice marketing business in the study area. This finding is in agreement with Penda *et al.* (2013) who reported that the married class dominates agricultural produce marketing in Nigeria.

Gender of the Respondents

Distribution of respondents according to gender was shown (Table 4). The table showed that 67.5% and 57.5% of the rice retailers and wholesalers respectively were females. This indicates that rice marketing in the study area was dominated by females. The result were supported by Thompson and Agbugba (2013) and Osondu *et al.* (2014) assertion that agricultural produce marketing were predominantly carried out by women in Nigeria.

Household size of the respondents

Distribution of the respondents according to their household size was shown (Table 5). The table shows that 67.5% of the rice retailers and 50.0% of the rice wholesalers had household size of 5-8 persons. Also, 25.0% of the rice retailers and 20.0% of the rice wholesalers had household size of 1-4 persons. The mean household size of the retailers and wholesalers were 7 and 8 persons respectively. Household size has major implication in the provision of family labour and is the most important input for unpaid labour (Akpa, 2007). Bauchi *et al.* (2008) reported that large household size is an advantage to marketers as members of the households could help in providing labour while carrying out some of the marketing function. However, Ijioma and

Osondu (2015) noted that large household size could limit net returns from marketing due to diversion of potential investment fund resulting from increase in household consumption expenses.

Marketing Experience of the Respondents

The distribution of respondents according to marketing experience was shown (Table 6). The table shows that 15.0% of the rice retailers had 1-5 years of experience, 25.0% of them had 6-10 years of experience, 30.0% others had 11-15 years of experience and 15.0% had 16-20 years of experience. While, 10.0% of the rice wholesalers had 1-5 years of experience, 17.5% of them had 6-10 years of experience, 25.0% of them had 11-15% of experience and 32.5% of them had 16-20 years of experience. The mean marketing experience of the rice marketers was 11.8 years for retailers and 14.1 years for wholesalers. This implies that the rice retailers and wholesalers were fairly experienced in rice marketing.

According to Oluwatayo *et al.* (2008), marketers with more experience would be more efficient, have better knowledge of market situation and are better positioned to run a more efficient and profitable enterprise. Marketing experience is important in determining level of profitability attained by marketers. The more number of years in marketing, the more the knowledge and profit the marketer gets since he/she would use his/her understanding of marketing system, market condition, market trend and market price and bargaining power to maximize profit (Lawal and Idega, 2004). Both the retailers and wholesalers of rice were well knowledgeable in rice marketing activities.

Source of operating capital of the respondents

The distribution of respondents according to sources of operating capital was shown (Table 7). The table showed that 83.8% and 47.5% of the rice retailers obtained their operating capital from their personal savings and relatives/friends respectively, while, 13.8%, 11.3%, 7.5% and 1.3% of them obtained their operating capital from cooperative societies, micro-finance banks, local money lenders and agricultural banks respectively. On the other hand, 92.5% and 35.0% of the rice wholesalers indicated their source of operating capital as personal savings and relatives/friends respectively, 17.5%, 25.0%, 7.5% and 5.0% of them sourced their operating capital from cooperative societies, micro-finance banks,

local money lenders and commercial banks respectively.

It was implied that majority (83.8% and 92.5%) of the rice retailers and wholesalers respectively used equity capital as their sources of capital to start up rice marketing. Also, only 12.6% of the rice retailers and 30.0% of the rice wholesalers had access to obtain capital from formal sources of credit. Low access to credit facilities has been the problem that agricultural produce marketers faces in their business as reported by many researchers. According to Osondu *et al.* (2014), inadequate access to credit facilities is a major problem limiting ability of agricultural produce marketers to increase marketing scope.

Type of rice marketing by the respondents

The distribution of the respondents according to types of rice marketed was shown (Table 8). The table showed that 86.3% and 13.8% of the retailers marketed processed rice and paddy rice respectively. While 100.0% and 17.5% of the wholesalers marketed processed rice and paddy rice respectively. It implied that the rice marketers were more involved in marketing of processed rice. This could be as a result of the higher rate of turnover in processed rice compared to rate of turnover of paddy rice.

Marketing association of the respondents

Distribution of respondents according to membership to marketing association was presented (Table 9). The table showed that 27.5% of the rice retailers belong to one association or the other while 72.5% of them do not belong to any marketing association in the study area. Meanwhile, 60.0% of the rice wholesalers do not belong to any market association and 40.0% of them belong to at least one market association. The rice marketers involved in this research were aware of the importance of belonging to a marketing association. Despite this, large proportions (72.5% for retailers and 60.0% for wholesalers) of the traders do not belong to any marketing association or cooperative society. Traders groups in the study area were found to be inactive and there was not evidence of any tangible effort for group trading.

Marketing channel of rice

A diagrammatic representation of rice marketing channels in Ohaozara LGA of Ebonyi State of Nigeria was presented (Fig. 1). It was showed the different channels of rice marketing in the study area. It was seen that the rice farmers/producers sell their paddy and processed rice to the

wholesalers who resell these products to retailers and the retailers sell to consumers. However, the rice farmers also sell their products directly to the wholesalers, retailers and end users. The marketing channels had no specific direction as it follows different routes due to changes in the market condition.

The broken arrows represent alternative route of the product channels. This entails a skip of the normal route where a retailer bypasses the wholesalers and buys directly from the producer, and also consumers buy directly from the

wholesalers or producer skipping the retailers. The essence of this skipping was to purchase the goods at a reduced price. Hence, the marketing channel of rice in the study area could be termed a zero-level or a one-level marketing channel. To sell directly to the consumers, some rice farmers acquired small retail outlets in some local markets outside their villages, selling directly to consumers helped them to earn a relatively higher income.

Table 1. Distribution of rice marketers in ohaozara lga, ebonyi state according to age

Age	Retailers		Wholesalers	
	Frequency	Percentage	Frequency	Percentage
21-30	8	10.0	1	25
31-40	20	25.0	10	15.0
41-50	24	30.0	8	20.0
51-60	10	12.5	7	7.5
Total	80	100.0	40	100.0

Mean age of rice retailers = 43.84 Mean age of wholesalers = 45.36. Source: *Field Survey, 2017.*

Table 2: Distribution of rice marketers in ohaozara lga, ebonyi state according to their educational level

Educational Level	Retailers		Wholesalers	
	Frequency	Percentage	Frequency	Percentage
No formal education	4	5.0	2	5.0
Primary education	26	32.5	10	25.0
Secondary education	46	57.5	21	52.5
Tertiary education	4	5.0	7	17.5
Total	80	100.0	40	100.0

Source: *Field Survey, 2017.*

Table 3. Distribution of respondents according to marital status

Marital Status	Retailers		Wholesalers	
	Frequency	Percentage	Frequency	Percentage
Single	18	22.5	7	17.5
Married	50	62.5	27	67.5
Widowed	10	12.5	6	15.0
Divorced/separated	2	2.5	-	-
Total	80	100.0	40	100.0

Source: *Field Survey, 2017*

Table 4 Distribution of respondents according to gender

Gender	Retailers		Wholesalers	
	Frequency	Percentage	Frequency	Percentage
Male	26	32.5	17	42.5
Female	54	67.5	23	57.5
Total	80	100.0	40	100.0

Source: *Field Survey, 2017*

Table 5. Distribution of respondents according household size

Household Size	Retailers		Wholesalers	
	Frequency	Percentage	Frequency	Percentage
1-4	20	25.0	8	20.0
5-8	54	67.5	20	50.0
9-12	6	7.5	11	27.5
13 and above	-	-	1	2.5
Total	80	100.0	40	100.0

Mean Household size of retailers = 7.27 Means household size of wholesalers = 8.23 Source: *Field Survey, 2017*

Table 6: Distribution of respondents according to marketing experience

Marketing Experience	Retailers		Wholesalers	
	Frequency	Percentage	Frequency	Percentage
1-5	12	15.0	4	10.0
6-10	20	25.0	7	17.5
11-15	24	30.0	10	25.0
16-20	12	15.0	13	32.5
21 and above	12	15.0	6	15.0
Total	80	100.0	40	100.0

Mean retailer's marketing experience = 11.8, Mean wholesaler's marketing experience = 14.1

Source: Field Survey, 2017

Table 7. Distribution of respondents according to sources of operating capital for rice marketing

Sources of capital	Retailers		Wholesalers	
	*Frequency	Percentage	*Frequency	Percentage
Personal savings	67	83.8	37	92.5
Relatives	38	47.5	4	10.0
Cooperative societies	11	13.8	7	17.5
Local money lenders	6	7.5	3	7.5
Commercial banks	-	-	2	5.0
Micro-finance banks	9	11.3	10	25.0
Agricultural banks	1	1.3	-	-
Total	80	100.0	40	100.0

Source: Field Survey, 2017

*= Multiple responses recorded

Table 8. Distribution of respondents according to the type of rice marketing

Types of rice marketed	Retailers		Wholesalers	
	*Frequency	Percentage	*Frequency	Percentage
Paddy rice	11	13.8	7	17.5
Processed rice	69	86.3	40	100.0

Source: Field Survey, 2017

* = Multiple Responses Recorded

Table 9. Distribution of respondent according to membership to marketing association

Association	Retailers		Wholesalers	
	Frequency	Percentage	Frequency	Percentage
Yes	22	27.5	16	40.0
No	58	72.5	24	60.0
Total	80	100.0	40	100.0

Source: Field Survey, 2017

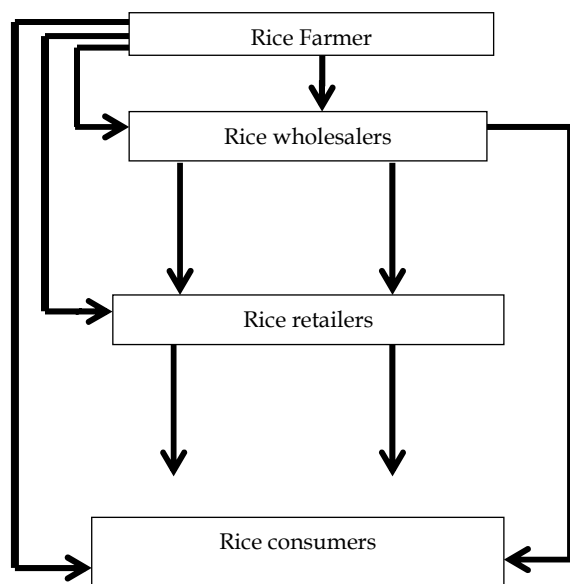


Fig 1: Distribution channels of rice marketing in Ohaozara LGA of Ebonyi State, Nigeria

Estimate of costs and returns of rice marketing in Ohaozara LGA

Profitability analysis of the rice marketers (wholesaler and retailers) in Ohaozara LGA, Ebonyi State was presented (Table 10). Estimation of net return analysis was made from rice marketing using average cost (fixed and variable cost) and income data generated by each of sampled rice marketers per month. It was showed that variable costs accounted for largest proportion (96.45% for retailers and 95.88% for wholesalers) of the total cost of rice marketing in study area. It showed that large amount of money was spent on procuring, processing, labour, transportation and packaging of rice by the marketers. Among the variable cost components, procurement/purchase cost was the largest accounting for 90-29% and 90-35% of the total cost incurred by the rice retailers and wholesalers respectively.

The high procurement cost could have been as a result of high price of inputs used in rice production used by farmers. The total variable cost accounted 3.55% for retailers and 4.1% of wholesalers total cost of rice marketing. This finding were in agreement with Abah *et al.* (2015) who asserted that variable costs were main cost components incurred in rice marketing. The marketing margin was N110 and N95 per kg of rice marketed by the retailers and wholesalers of rice respectively. The results also showed that an average total cost (TC) of N99982.6 and N377086.4 was incurred by the rice retailers and wholesalers in a month while total revenue (TR) of N130704 and N478401 was realized with gross margin (GM) of N34270.8 and N116839.8 and a net return (NR) of N30721.4 and N101314.6 respectively, among the retailers and wholesalers. This indicates that rice marketing in the study area was profitable. This result is in agreement with the findings of Ashaolu *et al.* (2006) who observed that fish marketing is profitable.

Factors affecting net income of the rice wholesalers

The estimates of the factors influencing net income of rice wholesalers were presented (Table 11). All tried functional forms regression model were significant at 1.0% alpha level. Implying that any of the functional forms can be used for predictive purposes. However, the double-log functional form gave the best fit to the data having produced highest R^2 value of 0.862, F-value of 419.351 at 1.0% alpha level of highest

number of significant variable that conformed to a *prior* expectations. The coefficient of multiple determinations (R^2) of 0.82 implies that 86.2% of the variation in net income among the rice wholesalers was explained by the independent variables while remaining 13.8% was explained by the joint action of other variable not included in the model. The significant F-value of 419.352 confirms the overall equation of the regression to be statistically significant.

The significant variables that explained variation in wholesalers net means are labour cost, transportation cost, price of rice, education level and marketing experience. Specifically, labour cost had a negative statistically significant coefficient (-0.550) at 10.0% alpha level. This indicates that labour cost exerted a negative influence on net income of the wholesalers and implies that increase in labour cost all things equal will lead to decrease in their net income from rice marketing.

The finding was in line with a *prior* expectation and compares favourably with Osondu (2015) findings in Ebonyi State and Kalule and Kyanjo (2013) findings in Uganda.

Both transportation cost and price of rice had positive statistically significant coefficients (3.769) and (0.615) at 10.0% and 5.0% alpha levels respectively. This implies that increases in both variables caused increase in net income of the wholesalers. The sign of the coefficient on transportation cost is not in agreement with a *prior* expectation. This implies that increase in transportation cost as a result of handling more wares did not reduced net income. The sign of price of rice is in agreement with a *prior* expectation and also compares favourably with result obtained by Osondu *et al.* (2014).

The coefficient of educational level (0.632) was positively significant at 1.0% alpha level. The sign of the coefficient was in tandem with a *prior* expectation and implied that an increase in educational level of the wholesalers led to increase in income from rice marketing. The results were corroborated with finding of (Onyebinama, 2004), who stated that the level of educational attainment was likely to affect the degree of one's business alertness and ability to seize business initiative and advantages, hence increase profit.

Lastly, the coefficient of marketing experience (0.280) was positively significant at 1.0% alpha level. The sign of the coefficient is in

tandem with a *prior* expectation and implied that an increase in marketing experience of the wholesalers led to increase in net income from rice marketing. The implication was that the more experienced a marketer was more able to take rational decisions that will increase his income. The results consolidated to Isibor and Ugwumba (2014) findings of determinants of water melon marketers in Nnewi metropolis of Anambra State. According to Ezeh *et al.* (2012), experience gained as a result of old age and also while operating in a business makes for significant impact and was an index of entrepreneurial success.

Factors affecting net income of the rice retailers

The estimate of the factors influencing net income of rice retailers was presented (Table 12). All the tried functional forms of the regression model were significant at 1.0% level implying that any of the functional forms can be used for predictive purpose. However, the linear functional form gave the best fit to the data having produced an R^2 value of 0.744, F-value of 28.862 and highest number of significant variables that conformed to a *prior* expectations. It showed that five out of the eight variables fitted into OLS model significantly determined net income of rice retailers at varied alpha levels and signs.

Specifically, labour cost had a negative statistically significant coefficient (-2.322) at 10.0% alpha level. It indicated that labour cost exerted a negative influence on net income of retailers and implied that increase in labour cost will lead to decrease in retailer's net income from rice marketing all things being equal. The findings were in line with a *Prior* expectation and compares favourably with Osondu (2015) findings in Ebonyi State and Kalule and Kyanjo (2013) findings in Uganda. The coefficients of both transportation cost (-1.137) and processing cost (-2.678) were negatively signed and significant at 1.0% and 10.0% alpha levels respectively. It implied that increase in both variables causes decrease in net income of the rice retailers. Both findings were in agreement with a *prior* expectation.

The finding with respect to transportation cost compares favourably with Osondu (2015) and Abah *et al.* (2015) but disagrees with findings of Osondu *et al.* (2014) and Kalule and Kyanjo (2013). The coefficient of educational level (2.443) was positively significant at 5.0% alpha level. The sign of the coefficient was in tandem with a *prior*

expectation and implied that an increase in educational level of the retailers led to increase in net income from rice marketing. The result agreed succinctly with (Onyebinama, 2004), who stated that the level of educational attainment was likely to affect the degree of one's business alertness and ability to seize business initiatives and advantages, hence increased profit.

Lastly, the coefficient of marketing experience (0.101) was positively significant at 1.0% alpha level. The sign of the coefficient is in tandem with a *prior* expectation and implied that an increase in marketing experience of the retailers led to increase in net income from rice marketing. The implication was that more experienced a rice retailer is the more he/she was able to take rational decisions that will increase income. The result consolidates Isibor and Ugwumba (2014) finding on determinants of water melon marketers in Nnewi metropolis of Anambra State. According to Ezeh *et al.* (2012) the experience gained as a result of old and also while operating in a business makes for significant impact and was an index of entrepreneurial success.

Problems encountered by the rice marketers

Distribution of respondents according to problems facing rice marketers in Ohaozara LGA of Ebonyi State, Nigeria was presented (Table 13). It showed that the major problems encountered by rice wholesalers were inadequate finance (85.0%), price fluctuation (72.5%) and low access to credit (70.0). 67.5% and 62.5% of the wholesalers were also constrained by high transport cost and poor transportation network respectively. Among the retailers, the major problems encountered were inadequate finance (88.8%), low access to credit (77.5) and high transport cost (72.5%) and price fluctuation (71.3%). 52.5% and 46.3% of them complained that their rice marketing activities were hampered by poor transportation network and inadequate processing facilities respectively.

The high transport cost was probably due to bad roads which increased transport fare coupled with the fact that the farmers sponsored their business activities through their personal savings and as such do not have enough money to purchase the required quantity. The results compared favourably with results obtained by Ibitoye (2014) among agricultural produce marketers in Kogi State, Nigeria.

Table 10. Average monthly cost and returns marketing in ohaozara lga of Ebonyi State

Terms	Wholesalers				Retailers						
	Unit	Unit cost	Quantity	Value (N)	Percentage	totalUnit cost	Quantity	Value (N)	Percentage	total	
				cost components				cost components			
A. Revenue	Kg	235				420					
Average purchase price	Kg	330									
Rice consumed hold	Kg		1430kg	471900			296.7kg	124614			
Rice consumed at home	Kg		14.4kg	4752			12.3kg	5166			
Rice given as gift	Kg		5.3kg	1749			2.2kg	924			
Total Revenue (TR)				4.78401				130704			
B. Variable cost											
Purchase cost		235	1449.7kg	340679.5	90.35	310	291.2	90272	90.29		
Transportation cost				10800.6	2.86			2900.4	2.90		
Labour cost				3207.9	0.85			1320.0	1.32		
Processing cost				5668.2	1.50			1450.2	4.45		
Packaging cost				1205.0	0.32			490.6	0.49		
Total Variable cost (TVC)				361561.2	95.88			96433	96.45		
C. Gross Margin (GM) (TR-TVC)				116839.8				34270.8			
D. Fixed cost				7200.7	1.92			1208.8	1.21		
Rent interest on loan				6223.6	1.65			1420.0	1.42		
Depreciation				2400.9	0.56			920.6	10.91		
Placement											
Total fixed Cost (TFC)				15525.2	4.12			3549.4	3.55		
Toil (TVC HC)				37708				9998			
Net return = (TVC-TFC)				101314.6				30721.4			
Marketing Margin (Naira)				95				110			

Source: Field Survey, 2017.

Table 11. OLS estimates of factors influencing net income of rice wholesalers in ohaozara lga of Ebonyi State.

Variables	Functional forms			
	Linear	Exponential	Semi-log	Double-log+
Constant	-3144.134(-1.320)	10.476*** (48.438)	-62301.728	7.596*** (15.311)
Labour cost	-125.168 (-0.759)	-0.002 (-1.230)	-69715.545** (-2.222)	-0.550* (-1.828)
Depreciation cost	-3913.851 (-1.138)	0.042 (1.309)	-57383.046 (-1.690)	-0.54 (1-1.217)
transportation cost	2.637 (1.162)	1.801 (1.654)	1.838 (0.931)	3.679*(1.734)
Processing cost	-341.752 (-0.327)	-0.012 (-0.220)	25139.210 (1.108)	-0.17 (-0.560)
Price of rice	2227.061 (1.380)	0.006 (0.395)	1295.885 (0.432)	0.615** (2.276)
Educational level	31209.171*** (22.265)	0.045*** (3.437)	2284.9932*** (6.345)	0.632*** (13.475)
Marketing experience	17185.203*** (2.908)	0.555*** (10.023)	8455.977*(1.849)	0.280*** (4.726)
Rent/market charges	0.685(0.769)	-2.583E-006(-0.320)	4087.676(0.551)	0.013(1.399)
R ²	0.791	0.824	0.767	0.864
Adjusted R ²	0.789	0.816	0.747	0.862
F-ratio	216.435***	251.730***	43.293***	419.351***

Source: Field Survey Data, 2017, + indicates lead equation ***, **, *: Indicates variable i.e significant at 1.0%, 5.0% and 10% alpha.

Table 12. OLS estimates of factors influencing net income of rice retailers in ohaozara lga of Ebonyi State.

Variables	Functional forms			
	Linear+	Exponential	Semi-log	Double-log
Constant	23.387(0.344)	4.363*** (3.858)	-54.073*** (-4.026)	3.235*** (4.608)
Labour cost	-2.322* (-1.694)	-0.232 (-1.045)	-50.333 (-0.738)	-0.013 (-1.315)
Depreciation cost	-1.063 (-0.047)	0.002 (0.611)	-31.240 (-1.081)	-0.246 (-0.661)
transportation cost	-1.137*** (-2.978)	-2.642E-003** (-3.551)	-298.631*** (-3.892)	-1.025*** (-4.247)
Processing cost	-2.678* (-1.842)	-0.107*** (-3.16)	25.669 (1.516)	-0.066 (-0.126)
Product price	1.626 (0.064)	0.032 (0.167)	47.657 (0.425)	0.141 (0.076)
Educational level	2.443** (1.983)	0.167** (2.232)	201.467** (2.223)	1.133** (2.268)
Marketing experience	0.101*** (2.822)	5.206E-004* (1.787)	19.349*** (4.724)	0.147*** (3.304)
Rent/market charges	-0.579 (1.213)	0.001 (0.586)	-14.131 (-0.457)	-0.235 (1.204)
R ²	0.744	0.715	0.703	0.722
Adjusted R ²	0.726	0.697	0.665	0.704
F-ratio	28.863***	20.356***	15.714***	23.206***

Source: Field Survey Data, 2017, + indicates lead equation ***, **, *: Indicates variable i.e significant at 1.0%, 5.0% and 10% alpha.

Table 13. Problems encountered by rice marketers in ohaozaralga of Ebonyi State

Problems	Frequency*	Retailers	Wholesalers	Percentage
		Percentage	Frequency*	
Inadequate finance	34	85.0	71	88.8
Loss access to credit	28	70.0	62	77.5
Poor transportation network	25	62.5	42	52.5
High cost transport	27	67.5	58	72.5
Inadequate processing facilities	13	32.5	37	46.3
Price fluctuation	29	72.5	57	71.3
Poor market information	9	22.5	24	30.0

Source: Field Survey, 2017

* = Multiple responses recorded

Osondu (2015) noted that inadequate capital and low access to credit was a major problem confronting most marketers in Nigeria and prevents them from increasing their wares.

Conclusion

Factors that influenced net returns of wholesalers' rice marketing includes: transportation cost, price of rice, education level, marketing experience and labour cost; while that of rice retailers are educational level, marketing experience, labour cost, transportation cost, and processing cost.

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