

Full Length Research Paper

Effects of marketing costs on gross margin: Evidence from guinea corn retailers in Wukari, Taraba State, Nigeria

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This study assessed the effects of marketing costs on the gross margin of guinea corn retailers in Wukari, Taraba State, Nigeria. The main aim of the study is not to only obtain precise costs and margins estimates for the conventional marketing functions of guinea corn, but rather to make the result of the analyses usable to devise a policy framework for an effective marketing strategy and improvement in the efficiency of guinea corn marketing and agricultural produce/products markets in Taraba State and Nigeria in general. Structured questionnaire was used to illicit response from forty guinea corn retail marketers across six local government areas of the state during the 2017 marketing season. Descriptive statistics were used to analyze the data collected, while Ordinary Least Squares Analytical Procedure was used to determine the parameter estimates of marketing costs. The average retailers' gross margin per 50 kg bag stood at ₦1,036.16, while price and transportation cost per 100 kg bag is ₦17,472.00 and ₦249.00, respectively. Storage cost for six months period stood at ₦163.00 per 100 kg bag. The results showed that retailers' selling price, transport cost, storage and cost due to perishability have significant effects on retailers' gross margin, at 8, 5, 10 and 9% levels, respectively. It is recommended that transportation facilities should be sustained by government, private individuals and corporate groups in addition to intensification of research into post-harvest storage and processing techniques. Again, funds and storage facilities should be made available to the marketers to enable them take advantage of bulk purchasing during harvesting seasons to ensure market expansion that will improve guinea corn marketing cum retailer gross margin like in the study area.

Key words: Guinea corn, marketing costs, marketing margin, retailers.

INTRODUCTION

Agriculture is an important sector in the Nigerian economy (Ivgababon, 2005). It contributes about 40 to 42.1% of the total GDP; employs about 70% of the labour

force; accounts for 70% of the non-oil exports and perhaps most importantly provides over 80% of food needs of the country. During the post-independent era,

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agriculture was at subsistence, though self-sufficient level. However, a decade after opened the way for food shortages as a result of declining production. Food shortage is not peculiar to Nigeria, but is attracting global attention as millions particularly in developing countries do not have enough production to meet their basic food needs. Millions more are also experiencing hunger, malnutrition, growth retardation and sometimes death due to starvation. Idachaba (2004) opined that food insecurity could be caused by both supply-side factors and demand-side factors. One of the supply-side factors of food insecurity he identified is food-marketing problem.

Guinea corn (*Sorghum bicolor* (L) Moench) is an important food crop in Nigeria; being widely grown in the savanna regions of the country. This crop forms a staple food for most of the population, especially in areas adaptable for its production such as Wukari Local Government Area of Taraba State. Like other crops, guinea-corn is well distributed by the marketers-wholesalers and retailers. Due to some costs such as transport, storage and costs incurred due to perishability of the produce, poor pricing, returns cum margins prevail leading to the inability of the retailers to mark up for their efforts. This situation culminates to delay and difficulty in getting the produce to the consumers at the right time and place. However, in order to assess the effects of marketing costs on the gross margin of guinea-corn retailers in Wukari Local Government Area of Taraba State, the transportation costs, marketing infrastructure costs, storage costs, costs due to perishability and cost of capital of the retail marketers were examined among other factors that result in price changes and margins at point of retailing and their levels of influence on the gross margin of the retailers determined. On the average, guinea corn production in Nigeria between 2013 and 2016 stood at 6,485.5 metric tons per year, indicating an average annual growth rate of 2.51% (Agricultural Production Statistics by Country – IndexMundi, 2018).

The major problem is that prices of domestically produced guinea corn and the prices of labour involved as distributional process inputs used in getting the goods to the final consumers have risen faster than final consumer prices, leading to low margin (net income) of the retailers. The competitiveness of the market for the good is high since guinea corn is not sold exclusively through a limited set of retailers and is most likely to have a smaller gross margin. The socio-economic characteristics of the retailer itself can also matter, especially with retailers that operate with rapid turnover of stock typically applying smaller gross margins than others. Again, costs incurred in course of retail functions with prices paid at various channels have not been identified, so as to enable computation of margins and possible identification of major factors influencing retailer's income.

The broad objective of this study is to assess the

performance of retailer guinea-corn marketers in Wukari Local Government Area of Taraba State, Nigeria, while the specific objectives include to: (i) examine the marketing costs of the retailer marketers in Wukari LGA; (ii) identify the marketing channels and prices at each point of the marketing chain; (iii) identify the costs militating against marketing of Guinea corn in the study area; (iv) evaluate the marketing margins at retail point of the marketing chain; (v) determine the effects of the marketing costs on the marketing margin of retailer respondents. The hypotheses tested are: H_0 : Marketing costs of guinea corn retailers do not significantly influence their marketing margin. Against the alternative hypothesis: H_1 : Marketing costs of guinea corn retailers significantly influence their marketing margin.

The study is a documentation of the costs affecting the margin of guinea corn retailing in the study area. It creates awareness on the guinea-corn retail marketing issues among unemployed youths that could take up retailing of guinea corn as adjoin to trading on other agricultural products to obtain livelihood. Public in general will be aware of the reasons for the level of performance recorded by the guinea-corn retailers. Finally, it serves as encouragement to the guinea-corn marketers with respect to how to improve margins and net returns for a sound market performance in the area of study.

Literature review

In economics and marketing literatures, marketing margin refers to the difference between the price paid by the customers and the price paid to the farmer. Therefore, the criterion to determine the marketing margin is the difference between the prices of customers paying and farmers/producers receiving (Patrick et al., 2012). To investigate the marketing margin thoroughly and exactly, it is better to divide it into two smaller portions of wholesale margin and retailer margin. The wholesaler margin is the difference of the price at which retailers sell their product and the price which they pay to the farmers as they buy the product, and the retailer margin refers to the difference of the price at which the retailers sell the acquired products to the consumer and the price they pay to the wholesalers. In the export market; the total margin refers to the price at which the producer sell the item and the price at which the product is sold in the export market.

Guinea corn and its cultivation

Guinea corn is locally called *Ikakporo* or *dawa*. Plant scientists have described it as a major cereal of the world after wheat. Experts say that guinea corn is the most

widely cultivated cereal crop and accounts for 50% of the total cereal crops produced in Nigeria.

Study shows that about 8 million hectares of land is under guinea corn production with average yields of 1.7 t/ha and a total production of 9.3 million metric tons annually in Nigeria; making it the second largest producer of guinea corn coming next to USA and higher than India. Research shows that there is no shortage of indigenous varieties of guinea corn in Nigeria, but that there is a severe shortage of improved released varieties with good nutritional qualities to address the malnutrition in the population.

Guinea-corn is among the most important cereals in terms of nutrition, production and area planted. Roughly, 90% of the world's guinea corn area lie in the developing countries, mainly in Africa and Asia (FAO, 1996). These crops are primarily grown in poor areas subject to low rainfall and drought where other grains are unsuitable for production unless irrigation is available (Nyannor et al., 2007). Guinea-corn is widely grown both for food and as a feed grain and it constitute a major source of calories and protein for millions of people in Africa and Asia.

Nutritional value and economic importance of guinea-corn

Whole grains of guinea-corn contain approximately 89-90% dry matter (DM), 8.9-15% crude protein (CP), 2.8% ether extract (EE), 1.5-1.7% ash, 2.1-2.3% crude fibre (CF) and 71.7-72.3% nitrogen free extract (NFE) on fed basis (Ensminger and Olentine, 1978; Subramanian and Metta, 2000; FAO, 2012). The CP content of guinea-corn is higher than that of maize but almost equal to wheat. Protein content and composition varies due to genotype, water availability, temperature, soil fertility and environmental conditions during grain development. The protein content of guinea-corn is usually 11-13% but sometimes higher values are reported (David, 1995). Prolamins (kafirins) constitute the major protein fractions in guinea-corn, followed by glutelins. Grain protein is notoriously deficient in the essential amino acid lysine (Bohoua and Yelakan, 2007). Guinea corn is an important source of B vitamins except B12 and good source of tocopherols (FAO, 1995). Other B-complex vitamins present in guinea corn in significant amounts are vitamin B6 (0.5 mg per 100 g), folacin (0.02 mg/100 g), pantothenic acid (1.25 mg/100 g) and biotin (0.042 mg/100 g) (NRC, 1982). The B vitamins and minerals are concentrated in the aleurone layer and germ. Guinea corn grain contains about 1.5 ppm of total carotenoids. Anti-nutritional compounds (e.g. protease inhibitors, galacto-oligosaccharides, lectins, ureases, phytates, tannins, phenolics and saponins etc.) are plant constituents which play important role in biological functions of plants. Examples are the effect of these

compounds on man and animal organisms are partly negative because they can reduce the digestibility of nutrients and the absorption of minerals (Derman et al., 1980). They may also inhibit growth as a result of their negative influence on the function of pancreases and the thyroid gland, and can cause pathological alterations in the liver. NRC (1996), FAOSTAT (2005); and FAO (2012) reported that guinea-corn play an important role in both the dietary needs and incomes of many rural households. Like other cereal grains, they are energy feeds valuable for their high caloric contents. The grains are used for poultry feeds. It is also considered a helpful famine crop as it is easily stored for lean years; the grain is readily digestible, highly nutritious and versatile, it can be cooked like rice, ground to make porridge or flour or used to make cakes (de Wet, 1978; FAO, 2012). Guinea corn is eaten in different forms that vary from region to region. In general, it is consumed as whole grain or processed into flour, from which traditional meals are prepared (Taylor et al., 2006; Liu et al., 2012). Furthermore, of major importance is that across Africa, guinea-corn is becoming the grain of choice for lager and stout beer brewing by major international companies (Taylor et al., 2006). This is because of its competitive price and availability as compared to barley and its intrinsic good brewing properties in terms of starch content and malting quality. In Africa, guinea corn and millets are also used to produce a very wide range of traditional foods and beverage products (Taylor and Emmambux, 2008). Some of these have been exploited commercially, most notably opaque beer which is brewed industrially on a large scale in several southern African countries (Daiber and Taylor, 1995). With the rapidly increasing urbanization in Africa and growth of the middle class, who demand convenient and healthy foods, there is much scope for commercialization of other traditional African guinea corn and millet products.

Tannins (condensed polyphenols) and phytic acid in guinea-corn

Tannins are secondary compounds present in plants and comprise polyphenols of great diversity (Hoste et al., 2006). The physical and chemical properties of tannins vary between plants, in different plant parts and between seasons. At high levels (above 50 g/kg DM), tannins in plant material can become an anti-nutritional factor and can result in reduced feed intake and digestibility in animals (Barry and McNabb, 1999). All guinea corn contains phenolic compounds, including phenolic acids and flavonoids. Yellow guinea corn variety was reported to have low levels of tannin (Gualitieni and Rappaccini, 1990). These compounds can affect colour, flavour and the nutritional quality of the grain and products prepared from it. Tannins confer a bitter taste and protect the grain

against insects and birds that can cause reduction in grains (Taylor, 2004). The tannin content of seeds inhibits the activity of some enzymes hence adversely influences protein digestibility and cellulose breakdown (Vinod et al., 2005). Phytic acid and/or phytates compete with essential dietary minerals such as calcium, zinc, iron and magnesium to make them biologically unavailable for absorption. Guinea corn bran contain the highest levels of phytates. Forty to fifty percent of the phytate and of total phosphorus can be removed by abrasive dehulling (Reichert and Youngs, 1977).

Processing of guinea-corn

At household level, processing involves post-harvest handling such as drying, threshing, winnowing, sorting and storing. Production is characterized by predominance of traditional practices that entail planting of farmers home-saved seeds. The mature panicles are harvested using thumb knives and sundried on bare ground, rocks, or mats (NRC, 1996; Ahmed et al., 2013). They are later threshed by beating the dried panicles with sticks, winnowed in flat trays and dehulled in mortar and pestle followed by narrow utilization based on value-added products in the form of thin or thick porridge and alcoholic beverages (NRC, 1996; Ahmed et al., 2013). It is processed at household level, by the millers who at times double deal as stockists and processors. The grains are hard-hulled and normally ground finely before being fed to animals (Calder, 1960; Raju et al., 2003). A very fine screen is used as some of the grains are extremely small and may escape grinding if a larger gauged sieve is used (Calder, 1960). Development of products like flour to produce porridge, *atap* (millet or guinea corn and cassava) and yeast with the exception of milling, can also be done manually (Rooney, 1992). Oniang'o (1996) reported that fermentation makes nutrients present in the grains more readily available to the body by reducing the tannin binding ability. Fortification is the process of supplementing minerals and protein contents.

Problems of guinea-corn marketing in Nigeria

Labaris et al. (2014) outlined the following as the basic costs of guinea-corn marketing in Nigeria.

Transportation costs

This is because transport facilities are grossly inadequate, especially in the rural areas where majority of the food is produced. Road or rail route linking outlying districts with a main system are lacking and where available, they are not motor able throughout the year or are laced with potholes, which make it difficult for

vehicles to get to the farm sites and convey guinea-corn to the markets. The bad roads have increased guinea-corn post-harvest losses through damage to farm produce which affects the marketing of guinea-corn. This situation ends in available vehicle charging exorbitant fees to convey produce to market area. This has obvious implication on cost payable by consumers since transport cost will be built on the entire cost with a margin before market price is fixed.

Inadequate infrastructures

It is revealed that inadequate infrastructures are another problem constituting costs that affects guinea-corn marketing. Infrastructures such as storage and warehousing are lacking in most food markets. Insufficient storage facilities often lead to produce loss due to premature germination, fungal and bacterial attack, insects and rodents attack. This often led to increased marketing cost, resulting in high retail prices and reduced marketing margin and efficiency. Market information is also lacking. Sellers and buyers are not well informed about the sources of food supply, thereby reducing potential efficiency in the market. Other facilities such clean environment, communication facilities, health facilities, fire services, banking facilities, security facilities, water supply and good toilets are also lacking in most markets. These lead to reduction in income of marketers who pay extra fee to go to neighborhood to access these facilities. All these in addition to levies imposed and paid for the provision of the priority facilities weigh down the income of marketers.

Shortage of funds

Adequate fund is required in the area of bulk purchases, development of storage facilities, transport and processing facilities. Sometimes prospective guinea-corn marketers are often discouraged because of shortage of funds. Access to formal capital is predicated to collateral facilities and ownership of bank accounts among other requirements in spite of interest payment.

Seasonality and perishability of agricultural products

It was identified that seasonality and perishability are one of the costs of food marketing in the study area. The seasonal pattern of production and the perishable nature of food crops create a lot of costs. This is because the seasonal pattern creates surpluses during harvest which must be sold at low prices or stored (if storage facilities are available) for future sale at great costs. The costs is worsened by long chain of distributors, absence of uniform unit of measurement, small market size and high

risk of road accident and armed robbery in the study area. The quantity of these produce lost due to their perishable nature are as a result of poor storage and swells up the costs incurred by the marketer.

Marketing margin

Marketing margin is defined as the difference between the producer price and the consumer price and it can be affected by various factors. Marketing margin is an equilibrium entity that is a function of the difference between equilibrium retail and farm prices (Wohlgenant, 2001), or between export and farm prices (Carambas, 2005). Marketing margins provide neither a measure of farmers' well-being nor of marketing firms' performance. However, they give an indication of the performance of a particular industry (Tomek and Robinson, 1990), or an indication of the market's structure and efficiency. For instance, Gordon and Hazledine (1996) have argued and revealed in their study that the form of the market power is likely to manifest in larger marketing margins than would otherwise be the case. Marketing margins are the result of demand and supply factors, marketing costs and the degree of marketing channel competition (Marsh and Brester, 2004). Thus, margins reflect aggregate processing and retailing firm behavior which influence the level and variability of farm prices and may influence the farmer's share of the consumer food dollar (Gardner, 1975; Tomek and Robinson, 1990; Wohlgenant, 1989).

METHODOLOGY

The study was conducted in Wukari Local Government Area of Taraba State. Wukari Local Government has been the headquarters of the historically famous Kwararafa Confederacy which at the zenith of its powers extended to modern Niger, Plateau, Kogi, Nasarawa, Benue States and FCT in the north central geo-political zone, Edo and Cross River in the South-south zone, Kaduna, Kano and Katsina States in the north west zone and Bauchi, Gombe and Adamawa States in the north east zone (Taraba State at a Glance: tarabastate.gov.ng/about/, 2018). Wukari has over the years metamorphosed from a spiritual and cultural headquarters of the Jukun people to a political and administrative headquarters of former Wukari Federation which now consists of Wukari, Donga, Ibi, Takum, kurmi and Ussa Local Government Area of Taraba State (Taraba State at a Glance: tarabastate.gov.ng/about/, 2018). Wukari is a multi-ethnic area, predominated by the Jukun people who also call themselves Wapan, with the composition of other major ethnic groups as Ichen, Kpanzon, Chamba and Kuteb. Other ethnic groups that also live within the town and its environs that were considered as settlers are Tiv, Hausa, Fulani, Yoruba, Igbo and others. The Wukari people are predominantly farmers, hunters and partly fishermen, while some are civil servants. The dominant religion in the area is Christianity which is widely practiced; others are Islam and African traditional religion (Anyeze, 1983). Geographically, Wukari Local Government is situated in the southern part of Taraba state. It is bordered to the north by Ibi Local Government Area, east by Gassol Local Government Area, from the south by Donga Local Government

Area of Taraba State, and to the west by Ukum Local Government Area of Benue State. The Local Government Area has a total area of 4,308 km² (1,663 square mile), located at 7°51'N 9°47'E. According to 2006 National population Census figures, Wukari has a population of 241,546 people (Taraba State at a Glance: tarabastate.gov.ng/about/, 2018), projected to 271,546 people in 2017. Wukari vegetation lies on the Guinea Savannah zones, which is marked by mainly forest and tall grass. The plain and fertile land, and the consistent annual flood of the rivers and streams within the area makes the land a conducive area for seasonal farming and grazing, and all seasons fishing (Taraba State at a Glance: tarabastate.gov.ng/about/, 2018). These activities informed the distribution of cultural and natural resources of the area, and also make Wukari a very rich agricultural land. The land is suitable for the cultivation of both arable and perennial crops such as yam, cassava, rice, guinea corn, maize, millet, groundnut, cowpea, beans, banana, coconut, fruit trees and vegetables, as well as animals such as cattle, sheep, goats and pig among others. It is also blessed with large volume of mineral deposits such as salt, lead, zinc, limestone and others all untapped (Taraba State at a Glance: tarabastate.gov.ng/about/, 2018).

Primary data only were gathered from retailers in Chonku, Kente, Puje, Rafin-Kada, Tsukundi, etc. This means that out of the population, a sample of 8 respondent retailers each were drawn from each of the five markets in the local government area, making a total of 40 retailers as representative sample used in the study. The data were generated through a well-structured questionnaire. The structured questionnaire modules consisted of coded questions aimed at gathering information on traders' socio-economic characteristics, marketing services and costs, selling prices of producers, wholesalers, retailers, as well as purchase prices by consumers. Others were information on transportation, storage as well as costs incurred due to infrastructure development and perishability. In addition to the coded questions, there were open-ended questions to allow respondents discuss freely any of the particular marketing issues of concern to them.

Data retrieved from completed questionnaire were analyzed using descriptive statistics, frequency distributions, percentages, pie charts and least squares statistical methods of estimations which provided the logical means for drawing inferences from the results. Objective (i) was achieved using frequency distribution and percentages; objectives (ii) and (iii) were achieved using descriptive statistics; objectives (iv) was achieved using gross margin analysis, while objective (v) was achieved using OLS analytical technique. The estimation procedures presented below shows the gross marketing margins for retail level distribution of Guinea Corn as calculated for each respondent and formed the dependent variable in the regression analysis which inferred the effects of the marketing costs on retailer margins as presented in chapter four.

$$GMM_R = \frac{\text{RetailingPrice} - \text{WholesalePrice}}{\text{RetailingPrice} / \text{ConsumerPrice}} \quad (1)$$

The mark-up pricing model designed by Waugh (1964) specifies that the consumer price is the determining factor in concluding the difference between the retail price and farm price. The price of food products, for example, at the level of farm price is simply the retail price minus the marketing agent cost, defining the marketing margin as a function of retail price and marketing cost: Implicitly the model is represented thus:

$$MM = f(RP; Z) \quad (2)$$

Where, MM = marketing margin; RP = retail price and Z = vector of marketing costs.

The effects of marketing costs on retailers' margin are modeled as:

$$RM = \text{Retailers' marketing margin} = f(Z) \quad (3)$$

Where, Z_1 = transport cost, Z_2 = storage cost, Z_3 = cost incurred due to perishability, Z_4 = cost of capital, μ_i = error term.

RESULTS AND DISCUSSION

Table 1 shows the frequency distribution of guinea corn retailers according to age. The age range with the highest frequency is between 28 and 34. This indicates that the retail market is dominated by those within productive, active struggling age brackets. This finding is in line with result of Emokaro and Egbodion (2014), in a study on effect of marketing cost on marketing margin realizable from beef sales in Benin City, Nigeria, which showed that majority (87.5%) were within the age bracket of 30-39 years, that is, were in their active age of production and (85%) of the marketers were married. The results of the regression analysis indicated that marketing cost (packaging, handling, processing and transportation costs) explained about 91% of the systematic variation in the marketing margin realized from beef marketing in the study area. It was also shown that unavailability of credit facilities, high cost of transportation, high marketing charges and perishability of beef were the most serious constraints faced by the marketers. Besides, the findings of Lawrence and Sylvester (2014) on socio-economic characteristics, in their research titled "The Structural Performance of Artisanal Fish Marketing in Ondo State" revealed that the respondents with age range of 31-40 years had the highest frequency with 37.6%. This is followed by the respondents with age range of 21-30 years old with 27.2%. This implies that majority of the respondents between the ages of 21 and 40 years old are young and agile people involved in artisanal fish marketing in the study area, just as those within the same age limit are involved in marketing of Guinea Corn in Wukari Local Government area of Taraba State. Hitherto, Kainga Ebiowei (2013) in their work, "Marketing margin and determinants of net return of watermelon marketing in Yenagoa metropolis of Bayelsa State, Nigeria" showed that 70.0% of the respondents were within the age of 21-40 years. This is also consistent with the active age limit of respondents engaged in marketing activities. This means that the young and the energetic individuals, with an ambition to excel by earning higher incomes through marketing of their goods tend to expand investments or engage in different activities by being more active in terms of saving costs to improve margin. And in this way, the clientele within active age may accumulate much capital to plough back into the business, as against older marketers of the same goods. However, Lichtenthal and

Tellefsen (2001) is at variance since he argued that the age of the buyers of a product has a lot to do with level of retail sales. In other words, it is not only important to identify the age of retailers, but also the age of buyers.

The number of years spent in school as presented in Table 2 shows only two categories out of which 55% had first school leaving certificate, which agrees with the findings of Lawrence and Sylvester (2014) on socio-economic characteristics, in their research titled "The Structural Performance of Artisanal Fish Marketing in Ondo State" that about 41.6% of the respondents, who were involved in artisanal fish marketing, had primary education, while 24% had secondary education. Also, this finding agrees with the results of Emokaro and Egbodion (2014) that the retailer beef marketers studied were fairly educated.

Table 3 shows the frequency distribution of the respondents according to years of experience. The table reveals that 15 respondents, representing 37.5% have years of experience ranging between 6 and 10 years. This is closely followed by those with 11-15 years of experience and a frequency of 9 (Table 3). This finding corroborates that of Emokaro and Egbodion (2014) that beef retailers have good marketing experience. It also agrees with Ebinga's (2014) study on Impact of Business Education in Enhancing Sales Volumes of Retail Businesses in Ohaozara Local Government Area of Ebonyi State where it was found that business education helps to improve managerial competence of retailers in Ohaozara Local Government Area.

Family size is recognized as a major source of labour in small holder agricultural activity in most African countries. In this scenario, it comprises the labour input of all males and females in a household with respect to marketing activities they carry out in the course of retail business. The insignificant contribution of this parameter may not be unrelated to probable increase in costs arising from consumption and movement of a reasonable member of the family to the sales outlet and back. However, the social links of the members of the family may increase sales on the long run. The frequency distribution of the respondents according to family size is presented in Table 4. The table shows only two distinctive categories representing 45% of the respondents' family sizes ranging between 1-4 and 5-8 members. Put differently, family size influence consumption and cost.

Marketing channels, margins and marketing costs

The existing key marketing channels in the distribution chain identified include: farm gate, rural assembling level, retail level and retailer level. The information on price obtained from these levels was from producers, retailer marketers and consumer responses. The retailer level gross margin was calculated as indicated in the estimation procedure in the methodology. And the array

Table 1. Frequency distribution of retailers according to their age.

Age range	Frequency	Percent
28-34	14	35
35-41	7	17.5
42-48	8	20
49-55	8	20
56-62	3	7.5
Total	40	100

Source: Field Survey (2017).

Table 2. Frequency distribution of retailers according to the number of years spent in school.

Number of years in school	Frequency	Percent
6	22	55
12	18	45
Total	40	100

Source: Field Survey (2017).

Table 3. Frequency distribution of retailers according to the number of years of experience.

Years of experience	Frequency	Percent
1-5	4	10
6-10	15	37.5
11-15	9	30
16-20	6	15
21-25	7	7.5
Total	40	100

Source: Field Survey (2017).

Table 4. Frequency distribution of retailers according to family size

Family size	Frequency	Percent
1-4	18	45
5-8	18	45
9-12	4	10
Total	40	100

Source: Field Survey (2017).

of the gross margins so calculated formed the set of independent variable used in regressing the marketing costs identified. The identified marketing costs include transportation cost, storage cost, cost incurred as a result

of the perishability nature of products, and infrastructure development costs.

Effects of marketing costs on retailers gross margin

The determinants of guinea corn retailers’ gross margin as presented in the model gave an average R-square 0.9665, which implies that all the explanatory variables included in the model explained up to 97% of the variations in the retailers marketing gross margins in the study area (Table 5).

The variables found to positively and significantly influence the retailers’ gross margin included, retailers sales price, initial capital and transport cost. Storage and costs due to perishability have negative and significant effects on retailers’ gross margin, with cost due to perishability accounting for less. The positive effect of initial capital is not significant.

As shown in Table 6, the coefficient of retailers’ selling price is 0.033 which is significant at 8% level of significance; showing a direct relationship with retailers’ gross margin. This implies that a unit increase in retailers’ sales price will increase the retailers’ margin by 0.033 unit, all things being equal. This is in agreement with the findings of Wohlgenant and Mullen (1987), that marketing margin is influenced by factors such as shifts in retail demand, farm supply and marketing input prices; in addition to other important factors, including time lags in supply and demand, market power, risk, technical change, quality and spatial considerations.

Transport cost has a coefficient of 0.037 which is significant at 5% level of significance. This implies that there is a direct relationship between transport cost and Guinea Corn retailers’ gross margin in the study area, implying that an increase in the transport cost would lead to an increase in the gross margin of the retailers. It is evident that the retailers pay commensurate transport costs that does not affect margin negatively, hence the more goods transported and sold, the more the margin made from sales. Additional information provided confirmed that total cost of goods includes overall production, transportation, distribution, warehousing and marketing costs (Hamlett, 2018), implying that determining a product’s markup involves a company use of the product’s selling price and total cost, while in determining gross margin/profit, a company takes its total revenue and subtracts cost of goods sold.

The coefficient of storage cost is -0.006 and presumably significant at 10% level of significance; showing an inverse relationship with retailers gross margin. This implies that a unit decrease in in storage cost will increase the retailers’ margin by 0.006 units all things being equal. Storage cost is here interchangeably used as cost of warehousing of retail products (Table 6).

The coefficient of cost due to perishability is -0.037

Table 5. Model summary.

Model	R	R Square ^b	Adjusted R square	Std. error of the estimate
1	0.984 ^a	0.969	0.964	18.48341

^aPredictors: Cost due to perishability, transport cost, initial capital, storage cost, retailers' price.

Table 6. Effects of marketing costs on retailers gross margin.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	Retailers' price	0.033	0.012	5.833	2.797	0.008
	Initial capital	0.000	0.000	0.378	2.170	0.037
	Transport cost	0.037	0.006	1.003	5.848	0.000
	Storage cost	-0.006	0.002	-0.617	-2.589	0.014
	Cost due to perishability	-0.037	0.013	-5.620	-2.759	0.009

^aDependent variable: Total gross margin per retailer.

Table 7. Model summary.

Model		Sum of squares	Df	Mean square	F	Sig.
1	Regression	371853.941	5	74370.788	217.690	0.000 ^c
	Residual	11957.272	35	341.636		
	Total	383811.213 ^d	40			

^aDependent variable: Total gross margin per retailer. ^bPredictors: Cost due to perishability, transport cost, initial capital, storage cost, retailers' price

which is negative and significant at 9% level. This is an inverse relationship, implying that for each unit decrease in cost due to perishability, gross margin increases by 0.037 units. This is in agreement with the findings of Muhammad et al. (2005) in their study on "An Assessment of Marketing Margins and Physical Losses at Different Stages of Marketing Channels for Selected Vegetable Crops of Peshawar Valley", where they stated that it is difficult to assess whether the large marketing markups reported in the case of different vegetable crops are necessarily exploitative. However, it is plausible to note that as margin increases, costs incurred due to perishability decreases.

Conclusion

From Table 7, it can be deduced that since the model $p = 0.0001$, the model is significant, implying that not all b 's are zero. Therefore, the null hypothesis " H_0 : Marketing costs of Guinea corn retailers do not significantly influence their marketing margin", is rejected; more so, $F^*Cal = 217.96 > F^*Tab 2.45$, while retailers' selling price, transport cost, storage and cost due to perishability are

all significant at 10% level presumably. It is concluded that marketing costs influence the gross margin of guinea corn marketers in Wukari Local Government Area of Taraba State, Nigeria.

RECOMMENDATIONS

Based on the findings, the following recommendations are proffered:

1. The negative significant effect of marketing cost incurred due to perishability, requires that retailers who purchase unprocessed Guinea corn should embark on post-harvest in addition to storage measures to overcome cost due to perishability and improve on their net margin.
2. Based on the negative significant effect of storage cost, it is recommended that retailers that store the produce longer should embark on spoilage reducing measures to reduce spoilage of stored produce to improve net margin.
3. Given a high positive significant effect of transportation cost on gross margin of guinea corn marketers, it is recommended that the understanding between retailers and transporters of the goods be sustained and

maintained to improve margin of marketers.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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