

Performance of Watermelon Marketing in Enugu State, Nigeria

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Abstract

Watermelon is one of the most sought-after fruits in tropical Africa because of its delicious taste and nutritional value. Owing to its increasing high demand among consumers, this study analyzes its marketing performance in terms of market structure, marketing margin, marketing efficiency, and profitability. Multi-stage sampling technique was employed in the selection of 160 respondents used in the study. Primary data were collected using a set of well-structured and pre-tested questionnaire. Data were analysed using descriptive statistics, gini coefficient model, net marketing income, and marketing efficiency index. The result of the study shows high level of income inequalities (sales margin) in the distribution of income amongst watermelon marketers and high concentration of watermelon marketers in the study area which indicated high inefficiency in the market structure. The result on market structure showed that there were no barriers to entry at the retail level but there are some barriers at the wholesale level. Profitability analysis showed that the watermelon enterprise is viable. High perishability, lack of credit facilities, and price fluctuations were major challenges that confronted all the marketers in watermelon enterprise. The study recommends provision of credit facilities and infrastructural improvements to reduce the constraints faced by marketers.

Keywords: Agricultural marketing, marketing efficiency, marketing channel, market performance, watermelon.

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1. Introduction

The recent global food and economic crisis have propelled the crusade and outcry for agricultural sector reform especially in the agricultural marketing value chain. Nigeria, like most developing nations of the world, is not left out in this global campaign for improvement in agricultural production and efficient agricultural marketing. More worrisome is the fact that Nigeria; being the most populous black nation in the world, its rapid population increase does not enjoy corresponding rate of increase in local food supply. Furthermore, the few produced foods are not effectively and efficiently distributed due majorly to the poor performance of the marketing systems. The food demand far outstripped the level of supply which is creating an immense pressure on the teeming populations, resulting in further food crisis in the country. The agricultural products in the country especially fruits and vegetables if effectively harnessed and distributed nationwide through an efficient marketing processes in the form, place and time needed can help curb the menace of food insecurity on the populace. Marketing is one of the vital aspects of agriculture since agriculture entails the production of goods and services, and production is not completed until the commodity produced reaches the final consumers.

Watermelon (*Citrullus lanatus*) is a member of the cucurbit family commonly referred to as *Cucurbitaceae* (Huh, Solmaz & Sari, 2008); a warm-season crop related to cantaloupe, squash, cucumber and pumpkin (Georage, Darbie & Kelley, 2000). It is an important horticultural crop, mostly known for its sweet and juicy fruit, grown commercially in areas with long frost-free warm climates all over the world (Jeffrey, 2001; Prohens & Nuez, 2008). Baba, Yelwa and Sanchi (2014) reported that watermelon global consumption is greater than that of any other cucurbit. It is highly relished as a fresh fruit in different parts of the world because of its thirst-quenching attribute in addition to many other identified nutritional values and advantages (Ajewole, 2015). The consumption of the commodity in the recent times has witnessed remarkable development as it cuts across all socioeconomic classes. China is the leading producer of watermelon in the world; it provides one third of the total watermelons in the world, followed by Iran, Turkey, Brazil, Egypt, United States, Uzbekistan, Algeria, Russia and Vietnam completes the top ten producers in the world (FAOSTAT, 2017). Nigeria is one of the leading producers of watermelon in Africa, and the largest production of the crop comes from the Northern part of country, where the suitable agro ecology is found. However, a reasonable quantity of the crop could still be grown in other agro-ecologies with intensive management and is still economically feasible (Bosede, Olubunmi & Balogun, 2012).

Watermelon reaches consumers through the marketing system. Marketing is concerned with all stages of operation, which facilitate the movement of the commodities from the farms to the consumers. Marketing has economic value because it gives form, time and place utility to products and services (Asogwa & Okwoche,

2012). Therefore, increase in marketing activity of watermelon would enhance the provision of more and better produce at low price to increased number of people which would enable marketers to generate more income and increase welfare. The marketing channel of watermelon is an important part of its cost, and its location to the market may shorten the path of the distribution from producers to consumers and makes the marketing process simple and efficient (Egbuna, 2009). Efficiency in the marketing of watermelon is borne on the platter of an efficient market information provision (Oguntola, 2006). In fruit marketing, farmers and marketers determine the flow of information from the farm to the market place and this consequently influences the market performance.

Market performance is an appraisal of the process of marketing and how successful its aims and objectives are accomplished (Eronmwon, Alufohai & Ada-Okungbowa, 2014). Olukosi *et al.* (2005) defined market performance as the appraisal of the extent to which the interactions of buyers and sellers in a market facilitate and stimulate outcomes that are consistent with social purposes. It is the assessment of how well the agricultural and food system are carried out and how successful its aims are accomplished and a reflection of the impact of structure and conducts on product prices, costs and the volume and quantity of output (Hill, 1997). The performance of a market represents the economic result of structure and conducts and generally consists of an analysis of progressiveness, equity, allocative and pricing efficiency (Harrison, Henley, Riley & Schafter, 1975; Enete, 1999). Hence, the marketing system has to perform a number of services in order to achieve the time, place and form utilities of the consumers. To achieve these utilities, transfer costs are incurred; these costs are influenced by the nature of the product, distance, nature of road and methods of transportation (Anuebunwa, 2007). Profit, market margin and marketing efficiency are the most frequently used measure of market performance.

The potentials of watermelon as a cash generating crop is significant for farmers especially those residing near the urban areas. Recent reports indicate that exotic vegetables production generally generate higher profit, provide more employment and income to the farmers than those of indigenous vegetables (Isibor & Ugwumba, 2014). The high demand for this vegetable fruit is not met in the Southern part of Nigeria due to unfavourable climatic condition (Okonmah, Agbogidi & Nwagu, 2011). Consequently, there have been increased trade and commerce activities surrounding these commodities.

The consumption of exotic vegetable including watermelon has been on the increase but the cost of carrying out various marketing functions have led to astronomical rise in price, so much so that some consumers have subsided in its consumption (Nya, Okorie & Eka, 2010). This is partly because most of the watermelons marketed in Southern parts of Nigeria are usually produced in the rural areas of northern Nigeria. The quantity of watermelon available for consumption and the price paid by the consumer depends on how efficient the marketing system of watermelon functions. Watermelon marketers experience lots of problem in trying to meet demands due to fluctuation in supply. It is a perishable agricultural produce and cannot be stored over a long period of time.

Watermelon has attracted very insignificant marketing research attention compared to other food and cash crops; this is due partly because it is regarded as a minor crop. Several studies have been conducted with respect to watermelon production in Africa. Some focused on the traditional knowledge with respect to the cultivation and uses of watermelon in Mozambique (Munisse, Andersen, Jensen & Christiansen, 2011), economic analysis of its production system (Adeoye *et al.*, 2011), income and factor analysis of watermelon (Oladele, 2015). Though Onyemauwa (2010), Kainga (2013), Isibor & Ugwumba (2014) and Olumide (2015) concentrated on the marketing margins and marketing efficiencies of watermelon in their studies in urban areas of South-West and South-South of Nigeria, available literatures showed that limited researches were conducted along the costs, profitability, marketing efficiency, market structure and conducts of watermelon in Enugu State, Nigeria.

As regards the terms of price, there is considerable variability in watermelon prices within the year due mostly to seasonal changes in the volume of production. The distribution and availability of watermelon in Enugu State tends to be inadequate and inefficient as the product is rarely produced in the study area and its external influx could pose high cost of marketing on the product and implicitly the price of watermelon very exorbitant. In view of the rising demand for watermelon in the state in the face of inefficient marketing, therefore, it is pertinent and relevant to analyze the performance of the watermelon marketing in Enugu State, Nigeria. Consequently, the following research questions have remained unanswered; what are the socio-economic characteristics of watermelon marketers, what are the market structure and conducts of watermelon market in the study area, what are the net marketing returns of market participants, how efficient is watermelon market in the study area and what are the constraints associated with watermelon marketing in the study area.

The study specifically sought to describe the socio-economic characteristics of watermelon marketers; examine the market structure and conducts of watermelon marketing; determine the costs and returns of watermelon marketing; determine marketing margins and marketing efficiency of watermelon marketers and identify constraints militating against marketing of watermelon.

Watermelon marketing has a large potential to enhance agribusiness development, generate income and employment opportunities that will lead to significant impact in the rural sector particularly for households in the

non-producing areas like Enugu State. Efficient performance of watermelon marketing is of great importance in Nigeria as it enhances self-sufficiency, thereby assisting in the availability of watermelon on and off seasons. More so, watermelon marketing in Enugu state, Nigeria is an intervention strategy for the poor to earn extra income and source of livelihood especially for those living in peri-urban areas. Hence, this research is directed at providing information that would assist watermelon marketers on how best to attain efficiency in the marketing of the fruit in the study area.

2. Materials and Methods

The study was conducted in Enugu State, which is one of the five States in South Eastern Nigeria. The state lies between latitudes $5^{\circ}56'N$ and $7^{\circ}05'N$ of the Equator and longitudes $6^{\circ}53'E$ and $7^{\circ}55'E$ of the Greenwich meridian (Enugu State Agricultural Development Programme [ENADEP], 2009). Enugu State shares boundaries in the East with Ebonyi State, in the North with Benue and Kogi States, in the South with Abia State and in the West with Anambra State. The state occupies a land mass of approximately $8,022.95 \text{ km}^2$ with a population of about 3,257,298 (National Population Commission, 2006). The vegetation of the state is mainly forest type but stretches out into derived Savanah in the Northern fringes. It has a tropical climate and experiences distinct wet and dry seasons with a total annual rainfall of about 1,700mm (Enugu State Government Official Gazette, 1997). The rainy season starts from April to October and dry season from November to March (Okorie, 2012).

Farming is the major occupation of the people in the rural areas while trading and civil service dominate the economic activities in the urban areas. The people are warm highly enterprising and could be found engaged in trade all over the country; mostly engaged in small scale farming and marketing of many agricultural produce such as cassava, yam, maize, rice, watermelon, groundnut, pepper, cocoyam, and various kinds of fruits and vegetables. It has several markets both in the rural and urban areas where agricultural goods are sold.

2.1 Sampling procedure

Multi-stage sampling technique was employed in selection of respondents for this study. The first stage involved a purposive selection of four agricultural zones (Enugu, Nsukka, Agbani and Enugu Ezike) from the six agricultural zones in the State. This was necessary to allow for the selection of zones with substantial volume of watermelon marketing. In stage two, one LGA was purposively selected from each of the four agricultural zones, giving a total of four LGAs (Enugu North, Nsukka, Nkanu West and Udenu). The selection was based on the concentration of vegetables and fruits markets in the areas. Stage three also involved a purposive selection of two markets where watermelons are sold in relatively large quantities in the LGAs selected, this gave a total of eight markets (New Relief market, Ogbete market, Orié Orba, Obollo Afor market, Ikpa commodity market, Ogige market, Eke Agbani and Orié Awgu). Subsequently, from each of the selected watermelon markets, having obtained the sampling frame, 50% of respondents from each of the market were selected through simple random sampling. This gave a total sample size of 160 marketers, consisting of 64 wholesalers and 96 retailers.

Data were collected from primary source. The primary data were collected using a set of well structured and pre-tested questionnaire. The questionnaires were administered to the respondents with the help of research assistants familiar with the selected markets.

Data were analyzed with descriptive statistics and Gini coefficient model, net marketing income and market efficiency Index.

2.2. Model specification

2.2.1. Gini coefficient model

The value of the Gini coefficient lies between 0 and 1; where zero implies a perfect market with perfect equality and 1 implies a perfect inequality in the distribution of income, signifying an imperfect market. The closer the Gini coefficient is to zero, the greater the degree of equality and the lower the level of concentration and the more competitive are the markets (Anuebunwa, 2008). That is, the closer the value to unity, the greater the degree of inequality and therefore, the higher the level of concentration and vice versa. It is effective in determining the degree of concentration in agricultural commodity markets.

Mathematically, Gini coefficient (GC) is expressed as follow:

$$GC = 1 - \sum XY$$

Where:

X = the proportion of watermelon marketers,

Y = the cumulative proportion of total sales (income)

Σ = Summation sign.

2.2.2. Marketing margin model

Marketing margin for watermelon marketing refers to the difference between the price paid by the ultimate consumer and the price received by the watermelon farmer, or the difference between the producer price (farm gate price) and the retail price. Therefore in this study, the average prices of both the wholesalers and retailers of

watermelon were used in the computation of marketing margins. The selling price and the purchase price were obtained using the average of the prices given by each respondent. The prices were summed and divided by number of respondents to obtain the grand mean. The marketing margin for this study was expressed as a percentage marketing margin as follows:

For Wholesalers:

$$\frac{\text{Wholesale selling price} - \text{wholesale buying price}}{\text{Wholesale selling price}} \times \frac{100}{1}$$

For Retailers:

$$\frac{\text{Retail selling price} - \text{Retail buying price}}{\text{Retail selling price}} \times \frac{100}{1}$$

2.2.3. Marketing efficiency index

The Marketing Efficiency (ME) was calculated following Shepherd Futrel Model indicated as:

$$ME = \frac{\text{Output of marketing}}{\text{Input of marketing}} \times \frac{100}{1}$$

In line with Olukosi, Isitor and Ode (2005), output of marketing was proxied by net returns from marketing activities and input of marketing were proxied by cost of marketing activities.

Therefore, marketing efficiency was expressed as:

$$\text{Percentage (\%)} \text{ Marketing Efficiency} = \frac{\text{Net marketing returns}}{\text{Total marketing cost}} \times \frac{100}{1}$$

If the marketing efficiency equals one, the marketing is efficient but if it is less than one, the market is inefficient. However, if the marketing efficient is greater than one the market is highly efficient. If expressed in percentage; then, 100% indicates very efficient while less than 100% shows inefficiency in the system.

2.2.4. Net income analysis

The net income in this study refers to the difference between the total sales of watermelon and the total marketing costs. The total marketing cost is the sum of transport cost, storage cost, handling cost, cost of produce and other costs associated with moving the commodity from the point of purchase to the customer or final consumer and the depreciation values of marketing equipment. The model was specified as follows:

$$\pi = TR - TC$$

Where,

π = Net Income

TR = Total Revenue

TC = TVC + TFC

TC = Total Cost (₦)

TVC = Total Variable Cost (₦)

TFC = Total Fixed Cost (₦)

The straight-line method of depreciation was used to compute the depreciation of marketing equipment used. It was estimated as follows:

$$D = \frac{P - S}{n}$$

Where:

D = Depreciation (₦)

P = Purchase price (₦)

S = Salvage value (₦)

n = useful life of asset (number of years the equipment is used in marketing).

2.2.5. Likert scale rating technique

A likert scale is a psychometric scale in survey research. When responding to a likert questionnaire item, respondents specify their levels of agreement or disagreement on a symmetric agree - disagree scale for a series of item statement. The scale captures intensity of their feelings. A 4 - point rating scale was employed in this study. This was regarded as strongly agree (SA), agree (A), disagree (DA), and strongly disagree (SD), with corresponding values of 4, 3, 2, and 1 respectively.

The mean score (MS) of the respondents based on the 4-point rating scale was computed as $\frac{4+3+2+1}{4} = 2.50$ cut off point.

Based on this, any score below 2.50 (MS<2.50) was taken as a weak factor and may not be considered while those with mean score of above 2.50 (MS>2.50) were taken as strong factors and thus be considered.

3. Results and Discussion

3.1. Socioeconomic characteristics of the watermelon marketers

The socioeconomic characteristics considered in this study are gender, age, marital status, household size, educational level, marketing experience and occupation of the respondents. The distributions of the marketers according to their socio-economic characteristics are presented in Table 1.

Table 1: Socio-economic Characteristics of Watermelon Marketers

Variables	WHOLESALEERS (64)		RETAILERS (96)		TOTAL (160)	
	Frequency	%	Frequency	%	Frequency	%
Gender						
Male	31	51.6	2	2.1	35	21.89
Female	33	48.4	94	97.9	125	78.13
Age						
≤20	-	-	3	3.1	3	1.88
21-30	1	1.6	16	16.7	17	10.63
31-40	2	3.1	13	13.5	15	9.38
41-50	36	56.2	35	36.5	71	44.38
51 & >	25	39.1	29	30.2	54	33.75
Mean	50.02		43.83		46.7	
Marital Status						
Married	58	90.6	64	66.7	122	76.5
Single	1	1.6	25	26.0	26	16.25
Widowed	5	7.8	7	7.3	12	7.50
Household size						
1-3	4	6.2	22	22.9	26	16.25
4-6	29	45.3	42	43.8	71	44.38
7-9	29	45.3	29	30.2	58	36.25
10 -11	2	3.1	3	3.1	51	31.88
Mean	6.16		5.44		5.8	
Educational Status						
No Formal Education	-	-	4	4.2	4	2.50
Primary Education	26	40.6	40	41.7	66	41.25
Secondary School	30	46.9	47	49.0	77	48.13
Tertiary	8	12.5	5	5.2	13	8.13
Marketing Experience						
2-4	10	15.6	31	32.3	41	25.63
5-7	32	50.0	41	42.7	73	45.63
8-10	16	25.0	16	16.7	32	20
11-13	1	1.6	4	4.2	5	3.13
14-16	5	7.8	4	4.2	9	5.63
Mean	7.05		6.11		6.58	
Major Occupation						
Farming	-	-	5	5.2	5	3.13
Civil Service	4	6.2	5	5.2	9	5.63
Trading	60	93.8	71	74.0	131	81.88
Student	-	-	1	15.6	15	9.38

Source: Computed from field data, 2017.

The socio-economic analysis of the respondents showed that 51.6% of wholesalers were males while 97.9% of the retailers were females. This implied that males slightly dominated the wholesale level of the market while the females dominated the retail level. The result could be as a result of few females being willing to take the risks of long-distance trips, theft, transportation stress and other associated with sourcing the product from the northern part of the country. The result was in agreement with Isibor and Ugwumba (2014) who reported that males dominated the wholesale market level, while females dominated the retail level of watermelon in Nnewi metropolis, Anambra State. However, the result contradicted the finding by Agbugba (2014) who reported that marketing of fruits at wholesale level were dominated by females in Enugu State.

Tables 1 also showed that majority (44.38%) of the marketers were within the age range of 41 to 50 years. The mean age of the wholesalers was 50 years and that of the retailers was 44 years, implying that typical marketers of watermelon in the area were in the economically active age group. The results indicated that the marketers were young and energetic and are able to deal with the exigencies of travels; thus can bear the stress and take the risks involved in the enterprise especially at the wholesale level. This result agreed with Obetta (2015) who reported a modal age range of 30 to 50 years among plantain and banana marketers in Enugu, State.

The results of the marital status of watermelon marketers showed that majority of the wholesalers (90.6%)

and retailers (66.7%) were married while few (1.6%) of the wholesalers and retailers (26%) were single. Ani (2015) opined that marriage has a direct relationship with family stability; therefore the high percentage of married respondents suggested that the watermelon marketers were stable and able to make good business decisions.

With respect to household size, the result showed that the mean household size of the wholesalers and retailers were six and five members respectively. This implied that the two categories of marketers had available labour force to assist them in their respective businesses. However, Ijeoma and Osondu (2015) reported that large household size could limit the net returns from marketing due to the diversion of potential investment funds as a result of increased household consumption expenses. The result was in consonance with the mean household size of six persons reported by Faith, Jagaba, Ramatu and Ingye (2011) in their study of cowpea marketing in Niger State.

Results on the educational status of the marketers showed that 40.9% and 41.7% of the wholesalers and retailers respectively had primary school education, while 46.9% and 49% of the wholesalers and retailers respectively had secondary school education only. The result indicated that the marketers are literate, an advantage which according to FAO (2006), could translate to higher business acumen in terms of level of profit. The result corroborates the finding of Ani (2015) who reported a similar educational status in Enugu State among soybeans marketers. This was also in accordance with Kim and Wade (2015) who reported that education is vital for the management and expansion of any enterprise and the higher the literacy level of an individual, the more skilled the individual is, and the more effective is the managerial abilities.

Majority of the wholesalers (50%) and retailers (42.7%) had between five to seven years marketing experience; few of the wholesalers (7.8%) and the retailers (4.2%) had marketing experiences between 14 to 10 years. Also, only 4% of the respondents had marketing experience of 11 to 16 years. The mean years of marketing experience for wholesalers and retailers were seven and six respectively. This implied that most of the respondents were new entrants and watermelon marketing is new and growing enterprise as new marketers were being added to it daily.

Majority of the wholesalers (93%) and retailers (74%) were full time traders. Results indicated that about 15.6% of retailers were students while farmers and civil servants accounted for 5% each of the retailers. The fact that majority of the wholesaler were full time traders could be attributed to the tedious and stressful nature of the business especially at the wholesale level. This could be attributed to the fact that majority of the watermelon marketed in the study area was purchased from Northern part of Nigeria. This was in line with Chukwudi (2006) who noted that success and stability of any business depends on the skill and experience of the manager, while Ugwumba (2010) and Ijeoma (2012) opined that education and experience are veritable tools for acquiring new ideas and skills that reflect positively on scope of enterprising, income and profit.

3.2 Structure of watermelon market

Gini coefficient was used to measure and examine their market concentration and degree of inequality of watermelon markets.

Table 2: Gini Coefficient for Watermelon Marketers

Income Class (₦)	Number of Marketers (Frequency)	Proportion of Marketers (X)	Cumulative proportion of Marketers	Total Sales (₦)	Proportion of Total Sale (Y)	XY
WHOLESALE						
3100000 - 5000000	28	0.438	0.438	110600000	0.3045	0.1334
5100000 - 7000000	24	0.375	0.813	150500000	0.4144	0.1554
7100000 - 9000000	12	0.188	1.000	102060000	0.2810	0.0528
Total (Σ)	64			363160000		0.3416
G.C.		1-0.3416 = 0.6584				
RETAILERS						
31000 - 100000	34	0.354	0.354	2545200	0.2022	0.0716
101000 - 170000	38	0.396	0.750	4605600	0.3656	0.1448
171000 - 210000	13	0.135	0.885	2502780	0.1989	0.0269
241000 - 310000	11	0.115	1.00	2945160	0.2338	0.0269
Total (Σ)	96			12598740		0.2702
G.C.		1 - 0.2702 = 0.7298				

Gini coefficient of marketers = $1 - \sum XY$

Source: Computed from field data, 2017.

Results in Table 2 showed that the watermelon wholesalers and retailers had a Gini coefficient of 0.6584 and 0.7298 respectively. The results implied high levels of income inequalities (sales margin) in the distribution of income amongst watermelon marketers and high concentration of watermelon marketers in the study area which indicated high inefficiency in the market structure. The inequality in the market could be as a result of variation in the investment level of the respondents. The results might also be an indication that some marketers could influence watermelon market price. The presence of a large number of marketers suggested that competition was fierce and price was determined by haggling, indicating a high level of inefficiency in their market structure. The results agreed with a watermelon marketing study by Olumide (2015) in Akure metropolis which showed a Gini coefficient of 0.7318 signifying a high level of income inequality among the marketers. However, the finding was contrary to the study by Obetta (2015) on marketing of plantain and banana in Enugu State, Nigeria, which showed a Gini coefficient of 0.494 signifying a low level of income inequality among the marketers.

Table 3: Market Characteristics of Watermelon Marketers

Market Variables	Wholesalers (64)		Retailers (96)	
	Frequency	(%)	Frequency	(%)
Access into Watermelon Market				
Ease of entry	14	21.9	96	100
Barriers to entry	50	78.1	-	-
Trade Union				
Membership of trade Union	50	78.1	6	6.2
Non-Membership of trade Union	14	21.9	90	93.8
Reasons for Restriction of Non-Members				
Registration Fee	45	70.3	-	-
Larger Market Share	35	54.7	-	-
Avoid Poor Pricing of Watermelon	41	64.1	-	-
Perception of Market Size by Buyers				
Very small	5	7.8	-	-
Small	14	21.9	12	12.5
Large	45	70.3	84	87.5
Perception of Market Size by Marketers				
Very Small	5	7.8	3	3.1
Small	35	54.7	11	11.5
Large	24	37.5	82	85.4
Reasons for the Number of Marketers				
Ease of Entry	22	34.4	96	100
Difficulty in Entry	30	46.9	-	-
Large Capital Outlay Required	59	92.2	6	6.2
Small Capital Outlay Required	5	7.8	90	93.6
Lack of Alternative employment	19	29.7	36	37.5

*Multiple responses were obtained

Source: Computed from field data, 2017

Table 3 showed the market structure (characteristics) of watermelon in the study area. Results of market structure at the retail level showed that there were no barriers to entry against potential entrants into the watermelon markets. All respondents (100%) indicated that marketers entered easily into the market, which indicated a tilt towards pure competitive market structure. The result agreed with the finding of Ajie (2014) on cocoyam markets in Rivers States, Nigeria. Most of the retail marketers (93.8%) did not belong to traders' union. More so, watermelon market associations or perishables traders' union existed in the study area but did not enforce restrictive rules to exclude anybody from selling at the retail level of the market. The almost non – restrictive traders' unions suggested that the watermelon market tends towards pure competition as against Gum Arabic market reported by Umar, Otitoaiye and Opaluuwa (2011) in Borno State but consistent with the plantain market as reported by Eronmwon, Alufohai and Ada-Okungbowa (2014) in Edo State, Nigeria. The large number of retailers (85.4%) as perceived by the respondents could be associated with the relatively small capital outlay needed to start the business.

The results of the market structure at the wholesale level were slightly different from that at the retail level.

In terms of barrier to entry, it was found that there were some barriers (78.1%) to entry against potential entrants into the watermelon marketing; though there were little or no restrictions (21.9%) in some markets; and most of the marketers (78.1%) belonged to traders' union. This restriction to entry by other marketers might be an indication of monopoly in the market. The results also showed that the major reasons for the restriction included registration fee (70.3%) and to avoid low pricing of the commodity (64.1%). On the perception of the size of watermelon wholesalers, result indicated that the number of wholesalers was significantly small (54.7%). Majority of the respondents (92.2%) indicated that the large capital outlay needed to start the business was the principal reason for the number of marketers at the wholesale level. This is not surprising, considering the long distance travelled by most of the wholesalers to purchase the product; huge transport cost and other marketing costs involved in moving the product from Northern States of Sokoto, Borno, Jigawa, Kano, Zamfara and Niger to the study area.

3.3 Conducts of watermelon market

The distribution of the respondents according to the marketing patterns is presented in Table 4. The result showed that majority of the wholesalers (96.9%) and retailers (94.8%) considered the absence of harvest wounds as most important criterion before purchasing watermelon while the absence of spot was the least criteria considered by the wholesalers (85.9%) and the retailers (79.2%). This could be associated with the perishable nature of watermelon. The harvest wounds could create channels for free entry of spoilage agents.

Table 4: Market Conducts of Watermelon Marketers

Market Variables	Wholesalers		Retailers	
	Frequency	(%)	Frequency	(%)
Criteria for Purchase				
Absence of Spot	55	85.9	76	79.2
Absence of Harvest Wounds	62	96.9	93	94.8
Size of Watermelon	59	92.2	91	94.8
Colour of Watermelon	61	95.3	89	92.7
Strategies used in Attracting Customers				
Sliced and Neatly Packaged	-	-	96	100
Attractively Displayed	56	87.5	96	100
Guaranteed Customers could Return	4	6.2	3	3.1
Different Sizes selected and Sorted	58	90.6	89	92.7
Strategies of fixing Selling Price				
Arbitrary Price Fixing	4	6.2	7	7.3
Price based on the marketing costs	63	98.4	94	97.9
Price based on the Demand and Supply	49	76.6	80	83.3
Price Fixed by Trade Association	8	12.5	3	3.1
Means of Purchase from Producers				
Per Head / Watermelon Fruit	2	3.1	96	100
Heaps (100 Units of Watermelon)	63	98.4	7	7.3
Per Head and Heaps	59	92.2	13	13.5
Means of Selling to the Buyers				
Per watermelon Fruit	62	96.9	-	-
Heaps	2	1.6	96	100
Sliced and Per watermelon Fruit	-	-	84	87.5
Sliced only	-	-	11	11.5

*Multiple responses were obtained.

Source: Computed from field data, 2017.

Results on the strategies of attracting customers showed that majority of wholesalers (90.6%) carefully sorted the watermelon based on sizes while all the retailers (100%) attracted customers by slicing (cutting sharply into small cubes); neatly packaging; and attractively displaying the watermelon in transparent materials. It was also found that 87.5% of the retailers combined selling per ball or whole watermelon with slicing of the fruits into small cubes.

The pricing techniques adopted by marketers were also shown in Table 4. The results showed that majority of the wholesalers (98.4%) and retailers (97.9%) adopted the pricing strategy of fixing prices after considering the cost of watermelon and marketing costs. More so, prices of watermelon were also mainly determined by

forces of demand and supply through bargaining. However, few wholesalers (6.2%) and retailers (7.3%) engaged in the arbitrary price fixing. The pricing strategies adopted by the marketers could be as a result of absence of weighing scales or standardized measures for most agricultural commodities. The result is consistent with that of Agbo and Usoroh (2015) and Adakaren (2014) in their analysis of pricing strategies used in marketing of various agricultural products. The results also indicated that majority of the wholesalers (98.4%) purchased their products in heaps of hundred. Purchasing in heaps made it convenient for both the wholesalers and producers/local assembler as a common price is usually arrived for all the watermelon in the heap. This could also be as a result of the large scale of produce sold by the producers to wholesalers.

However, all the marketers at retail level (100%) purchased watermelon per fruit/ head/ball while only few of them (7.3%) purchased in heaps. Findings further showed that, although the wholesalers bought in heaps of hundred, majority (96.9%) sold per fruit/ ball to the retailers while only 3.2% sold in heaps to the retailers. This could be attributed to the fact that majority of retailers traded watermelon in small quantities (average of 60 watermelon balls per week). Also, majority of the watermelon retailers (87.5%) sold per ball and also cut watermelon into small pieces and sold to different categories of consumers at much affordable prices since not all consumers could afford the price of a whole watermelon.

3.4. Net marketing returns of watermelon marketers

Net marketing returns of watermelon marketers were presented in Table 5.

Table 5: Mean Costs and Returns Structure for Watermelon Marketers per Month

Market variables (₦)	Wholesalers		Retailers	
	Cost per Kg (₦)	Total value (₦)	Cost per Kg (₦)	Total value (₦)
Average quantity of watermelon sold		56940kg		949kg
Average Selling Price per fruit	94.66		138.36	
				131,303.64
Total Revenue (A)		5,389,940.40		
Average Marketing Costs:				
Transportation		705,744		2,020.11
Storage		4,078.13		1,363.54
Packaging		-		1,154.58
Handling		25,659.38		1,133.44
Value of Watermelon losses		16,259.38		3,641.87
Market Commission		16,987.50		1,258.33
Telephone		10,218.75		736.98
Total Variable Costs (B)		778,947.10		11,308.85
Average Purchase Price per fruit (C)	51.60	2,938,104	94.66	89,832.34
Rent		4,073.80		1,365
Depreciation of Marketing Equipment		525.37		95.58
Total Fixed Cost		4,597.17		1,460.58
Total Marketing Cost (D)		3,721,648.27		102,601.77
Net Marketing Returns A-D		1,668,292.13		28,701.87

Source: Computed from field data, 2017.

The result of net marketing returns of watermelon sold per month in kg showed that the watermelon enterprise was viable. It was observed that the mean weight of 100 balls of watermelon weighed 365kg. At the wholesale level, the average selling price for a kg of watermelon was ₦94.66 while the average purchasing price was ₦51.60. On the other hand, the average selling and purchasing prices per kilogram at the retail level were ₦138.36 and ₦94.66 respectively. The mean marketing returns made by the wholesalers and retailers per month were ₦1,668,292.13 and ₦28,701.87 respectively. The high marketing returns made by the wholesalers was not surprising, considering that they purchased directly from the farm gate at a very low price. It could also be attributed to the economies of scale which they enjoyed as well as the high capital investment. However, the relatively low but modest net returns made by retailers could be attributed to the high cost of watermelon and the

numerous marketing costs incurred by the retailers as well as the low capital investment and high losses incurred due to perishability occasioned by low patronage by consumers. The result was in line with the findings of Adakaren (2014) and Impey (2000), that marketing costs decreased with increase in the quantity of agricultural commodities handled.

3.5. Marketing margin and efficiency of watermelon marketers

The result of the net marketing returns of watermelon traders in the study area were presented in Table 6.

Table 6: Mean Monthly Marketing Margin and Marketing Efficiency of Watermelon

Marketers	Purchase Price (₦)	Selling Price (₦)	Marketing Margin (%)	Marketing Efficiency (%)
Wholesalers	2,938,104	5,389,940.40	45.49	44.83
Retailers	89,832.34	131,303.64	31.58	27.97

Source: Computed from field data, 2017.

The study found that the average percentage marketing margins for wholesalers and retailers were 45.49% and 31.58% respectively. The variations in the margin could be attributed to the scale of business. These margins, though moderately high were enough to keep the marketers in the business. Isibor and Ugwumba (2014) found a higher margin of 54.5% for watermelon marketers in Nnewi metropolis. The results corroborate the finding by Agbugba (2014) in the marketing of vegetables in Southeastern Nigeria. The result was also in agreement with the finding of Achike and Anzaku (2010) who found similar result for benniseed marketers in Nasarawa state. On the contrary, the finding of Afolabi (2007) on poultry egg marketing in Southwestern Nigeria showed that the retailers' marketing margin was much higher than the wholesalers' margin.

The results of the marketing efficiency were also presented in Table 6. The result of the marketing efficiencies of watermelon marketers indicated 44.8% and 27.97% for wholesalers and retailers respectively. This implied that the marketing system of watermelon in the study area was not efficient and about 55.2% and 72.3% of inefficiencies existed in the wholesale and retail markets respectively. This high value of inefficiencies obtained in the study area was not surprising considering the long distance leading to high marketing costs incurred by the wholesalers. Also, the high cost of watermelon purchased by the retailers at the wholesale level could have been a factor in the inefficiencies recorded. The result confirmed the findings by Onyemauwa (2010), and Isibor and Ugwumba (2014), who found that watermelon marketing was not efficient in their studies. The result, however, contradicted the findings of Osondu *et al.* (2014) and Anyaegbunam and Nto (2011), who reported higher efficiencies among cabbage and sweet potato marketers in South-Eastern, Nigeria.

3.6. Constraints militating against marketing of watermelon marketing

The constraints militating against efficient marketing of watermelon in the study area were shown in Table 7.

The result showed that watermelon enterprise was bedeviled by many critical problems. The findings showed that though both wholesale and retail marketers have some common challenges, some challenges were more pronounced in either level of market. For instance, the results showed that high perishability (fruit spoilage), lack of credit facilities, price fluctuations, seasonality and the bulky nature of the commodity were the major challenges that confronted all the marketers in the study area. The findings agreed with Ekerete and Asa (2014) who reported spoilage of fruits and inadequate capital as major constraints of watermelon marketers in Akwaibom State. Kainga (2013) and Adeoye, Usman, and Badmus (2011) also reported that credit was a critical constraint to watermelon marketing and production respectively in Nigeria.

High transportation cost (3.88) was reported to be the most severe problem faced by the wholesalers in the study area (3.88). This could be connected with the long distances travelled by the wholesalers to purchase the commodity in the northern parts of the country as well as the bad road networks. Due to the nature of roads, transportation charges were found to be too high. This result corroborated the findings of Ani (2015) who found that high transportation in Enugu and Benue states was a major challenges faced by Soyabeans marketers. Achike and Anzaku (2010) also found transportation cost as a critical factor affecting benniseed marketing in Nasarawa State.

However, high transportation (2.00) was not reported as a major problem at the retail level of the market. The result could be attributed to the fact that majority of the retailers buy and resale in the same market and as such incurred less transportation and handling costs within the markets. The results also showed that cost of produce (3.71) was a major constraint faced by the retailers in the marketing of watermelon. This could be attributed to the high cost of transportation, handling costs and other marketing costs incurred by the wholesalers which are transferred to the retailers.

Table 7: Constraints to Watermelon Marketing

Constraints for wholesalers	Mean Value	Std. Deviation
High Transportation	3.88	0.333
Poor Market Access	2.17	0.827
Lack of Preservative facilities	2.67	0.977
Lack of Standardization	3.33	0.666
Irregular Supply	2.42	0.967
Bulkiness	3.45	0.615
Price Fluctuation	2.95	0.916
Lack of Access to credit Facility	3.56	0.500
High Cost of Produce	2.52	0.836
Perishability (Spoilage)	3.84	0.366
Seasonality	3.31	0.732
High Market Commission	3.17	0.865
Inadequate Market Information	2.28	0.826
Constraints for Retailers	Mean Value	Std. Deviation
High Transportation	2.00	0.880
Poor Market Access	1.82	0.821
Lack of Preservative facilities	3.24	0.677
Lack of Standardization	2.43	1.034
Irregular Supply	2.32	1.031
Bulkiness	3.22	0.836
Price Fluctuation	3.16	0.862
Lack of Access to Credit Facilities	3.54	0.579
High Cost of Produce	3.71	3.710
High Perishability (Spoilage)	3.90	0.307
Seasonality	3.34	0.765
High marketing Commission	2.41	1.025
Inadequate Market Information	1.53	0.739

Computed from field data, 2017.

Finally, the least severe constraints faced by the marketers, as shown in Table 7, were lack of market information and poor access to the market. This could be attributed to the easy means of communication and sharing of information made possible by availability of mobile phones and extension agents.

4. Conclusion and Recommendation

The study of market performance of watermelon using Gini coefficient, market efficiency index and marketing margin analysis provided information on how competitive, efficient and profitable watermelon markets are in Enugu State, Nigeria. Despite the economic viability of the enterprise in the study area, it was observed that some levels of inefficiency abound. The study showed that watermelon marketing did not exhibit competitive market behavior but characterized by high concentration of sales in the hands of few marketers as well as the unequal distribution of income among the marketers. There were no restrictions into the market especially at the retail level; though some restrictions were identified in some markets at the wholesale level.

The marketing margin and net marketing income appeared to favour the wholesalers than the retailers. However, all the middlemen had good share of the marketing margin and net marketing income. This is an indication that there exist potentials in watermelon marketing contributing positively to poverty alleviation especially in this period of economic recession in Nigeria. The study also showed that the net marketing income recorded was driven by the cost of produce, transportation cost, packaging cost, storage cost, market information as well as the educational status of the marketers.

The major constraints militating against the marketers in the study area included but not limited to perishability of watermelon (spoilage), transportation, lack of credit facilities, cost of watermelon, price fluctuation, seasonality and lack of preservation facilities. Therefore, to ensure efficient and improved performance of watermelon marketing in Enugu State, policies that will eliminate and address the marketing constraints should be formulated by government at various levels as well as Non-Governmental Organizations (NGOs).

Following the findings, the paper makes the following recommendations:

1. Credit facilities should be made more accessible to watermelon marketers by banks and other financial institutions at low interest rates. This will go a long way to reducing the financial constraints faced by marketers and provide business opportunities to the unemployed.
2. Transportation cost was shown to impact on the prices as well as the net marketing returns of

- watermelon. Government should formulate and implement policies targeted at improving infrastructures such as roads. Also due to the huge supplies of vegetable and fruits from the north, government should embark on the construction of railways linking the northern regions of the country to the southeastern states. This will drastically reduce the pressure of traffic on the roads.
3. The watermelon marketers should be encouraged to form cooperatives to enable them alleviate the financial hurdles as well reducing the cost of transportation of moving watermelon from the areas of production to the study area.
 4. Sufficient and modern market stalls should be built by government to ensure and foster conducive environment, and as well provide hygienic environment for the marketers. Entrance to the market stalls should be made accessible, so that vehicles transporting the products could reach the marketers' stall or space for bulk evacuation as well as easy for entry and exit in the market.
 5. There is need as well as room for market intermediaries to improve their technical knowledge and skills in marketing of watermelon and other perishables through training. This is to ensure that the marketing system becomes more responsive to consumers' demand.
 6. Government at all levels as well as NGOs should as a matter of urgency initiate and implement policies that will enhance the business of watermelon trading as a means of improving rural livelihoods and poverty alleviation in the study area.

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