

Analysis of Market Structure and Concentration in Nigeria (A Case of Kano State Rice Market)

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ABSTRACT

The paper is based on the structure and conduct of retail and wholesale rice marketers in kano state, Nigeria. A total of 182 questionnaires were administered to respondents (retailers and wholesalers) in the study area. Purposive sampling technique was adopted based on concentration of rice market in the market areas selected. The result of market structure shows freedom of entry and exit, large number of sellers, adequate market information on prices. These characterized the market as a perfectly competitive one. Market concentration was shown by the percentage of Gini coefficient obtained which was 0.2% for retailers and 0.087% for wholesalers. The study further recommended that favourable market conditions should be improved such that more wholesalers will find it easier to join the rice market.

INTRODUCTION

Nigeria has immense potential in rice production with the vast amount of arable land suitable for its production. The trend in rice consumption has over the years paved way for the need to increase production. For instance in the 1960s, Nigeria recorded a low per capita consumption of rice in West Africa with an annual average of 3kg (Okorowa and Ogundele, 2005). The trend in rice supply and demand in Nigeria range between 6.5% and 7.5% per annum respectively (Oyinbo, *et.al.*, 2013). This indicates that there has been increase over the years with corresponding increase in population growth. Thus, increasing production alone without a convenient marketing system may not stimulate farmers to maintain a stable level of production at local and national level in general. Strengthening the rice market is a prerequisite that is important in sustaining rice production in Nigeria. Even with international rice policies directed at enhancing strong expansion in traded rice volumes, the international rice market continues to remain volatile and distorted (Kang, Kennedy and Hilbun, 2009). Without a ready market for what is produced, farmers may not feel obliged to fulfill the governments' intention to make the country self-sufficient in rice production. Olomola (2005) stressed a need to improve the market structure and performance to enable farmers and agribusiness firms operate in a transparent and speculative business environment. It is imperative to put the enterprises on the path of efficient marketing management and competitive restructuring so as to achieve improved performance. With the vast amount of cultivable land in Nigeria, there is the potential for extending and intensifying rice production in Nigeria through development of an efficient marketing system. With increase in population of Kano, increase in productivity is of immense importance for increased income and employment generation throughout the production and marketing chain of rice in Kano. Hence, the need to analyze the various rice markets in kano state cannot be over emphasized as this would enable a clear view of the structural condition of the market. Improving the marketing of locally produced rice in kano can increase the demand for local rice if yield is enhanced with improved varieties and state of the art technology.

Analyzing market structure and concentration it is important to understand the key structural aspects of the rice market. This involves the number and concentration of market agents, ease of entry as well as the basic operations of these market agents at various levels of the marketing chain. Various studies have analyzed the structure, conduct and performance of rice in Nigeria. Abah, D.A; Anjeinu, A.G and Iorhon, A.P(2015) analyzed the structure and conduct of paddy rice marketing in Benue state, Nigeria. Their result revealed that the rice market operated an oligopsonistic market structure. A Gini value of 0.53%, 0.46% and 0.46% in zones A, B and C respectively of the market was obtained, thus revealing different levels of concentration of the rice marketers in the market. Being an important staple crop, further study on the structure and concentration of rice in Nigeria is necessary, hence, the need to carry out a similar study in northern part of Nigeria. This paper sets out to analyze the structure and concentration of rice market in Kano state, Nigeria. The study concentrates on the following objectives:

- i. To examine the structure of rice market in the study area
- ii. To determine the level of concentration of the rice market in the study area.

Theoretical Framework

Market structure looks at the behavior of firms and level of their competition in the market. The market structure which was pinned under the structure-conduct-performance paradigm began with the work of Bain (1956). It was based on two main ideas. First, it involved a one-way approach of causation that began from structure/concentration to pricing behavior (conduct) to performance. High market concentration would lead to high profits. Secondly, it was argued that the high market concentration could be traced to the presence of 'entry barrier'. According to Bain (1956), the barriers were present due to economies of scale in production. Critiques have found this argument as inadequate because some firms believed to have low economies of scale yet have high levels of market concentration. Advertising and R&D spending were added to entry barrier. As part of equilibrium outcome, levels of spending were jointly determined with the level of concentration. Hence, advertising and Research and Development (R&D) cannot be regarded as independent explanation for high concentration but rather these are co-factors that are jointly used. The core of the structure/concentration literature lay in relating level of concentration to profitability. A fall in market concentration due to reasons like entry, may affect level of prices and so price-cost margin. Weiss (1989) supported this idea by taking a number of markets that sell same product which differ in size (in terms of number of consumers) so that large markets support more sellers. This can be used to check whether prices and so price-cost margins are lower in those larger markets than smaller ones.

Gini coefficient developed by Italian statistician, Corrado Gini in 1912 is a measure of inequality of a distribution to measure the degree of market concentration. It is defined as a ratio with values between 0 and 1. It is sometimes expressed as a percentage between 0-100. It can be used to compare income distribution across different population sectors or countries. For instance, Gini coefficient for urban and rural areas may differ between countries. The graphical interpretation of the Gini index, its synthetical comprehension (where 0% is full equality and 100% perfect inequality) and the fact that it satisfies many aspect of axiomatic approach to inequality has favored its preeminence in the field of inequality theory (Cowell, 1988). The Gini index, till today, remains one of the most applied and studied measure of inequality (Langel and Tille, 2011)

Methodology

The study area

Kano state was created in 1967 and has a total of 44 local government areas with a population

of about 9,383,682 people (NPC,2006) and the current estimate stands at 12,000,000 (GEMS,2013). The state is located in North-West zone of Nigeria and it is one of the most populous states in Nigeria. Kano is situated along latitude 11° 30'N and longitude 8° 30'E (NPC, 2006). It has a land area of 20,760sq km. kano being the hub of local rice (Propcom, 2010) serves as a source of income and employment generation for people engaging in rice marketing. Major crops that are locally consumed include millet, maize, rice and cowpeas. Others like groundnut, cotton and hides and skin are mainly for exports to neighboring states and other countries as well. Farming and commerce are major occupations in Kano hence, the slogan, 'The centre of Commerce'. Rice is mainly cultivated and marketed in major local governments like Tudun Wada, Garko, and Kura.

Population and Sample

The population of the study consist of retail rice marketers in Kano state. Selected markets were Tudun Wada, Challawa, Dawanau and Garko rice markets. These markets were selected based on the concentration of rice marketing activities in the areas. Hence, sampling was based on concentration of rice markets and not according to local government. In each of the markets, a sample census of markets was undertaken and 10% of each for the retailers and wholesalers were randomly selected because it covers the required number of respondents for the entire population that is statistically allowed, giving a sample size of 125 and 57 for retailers and wholesalers respectively. A total of 182 respondents were sampled for the study.

Data Collection Procedure

Data was obtained using primary source. Primary data was gathered using a structured questionnaire. A total of 182 questionnaires were administered and all were returned.

Technique of Analysis

Data collected were analyzed using descriptive statistics i.e frequencies and percentages. Descriptive statistics was used to achieve objective (i). Objective (ii) was achieved by computing thr Gini coefficient for the market concentration. The study used the elements of market structure including degree of product differentiation, freedom of entry and exit, size of the market, market information about costs and prices to determine the type of market structure that exists for rice markets in the study area. The Gini coefficient was used to measure the level of inequality or otherwise among variables of interest among the rice traders.

Following Blessing and Shulammitte (2012), the Gini coefficient is represented as:

$$G.C = 1 - \frac{\sum_{i=0}^{n-1} (Y_{i-1} + Y_i)(X_i - X_{i-1})}{\dots\dots\dots(i)}$$

Where

G.C= Gini coefficient

Y= cumulative percentage of rice sellers

X= cumulative percentage of their sales

The Gini coefficient is the rate of the area between the Lorenz curve and the 45⁰c line to the area meter the 45⁰c line. Market concentration is a key element in market structure, hence, determines the type of competition. A concentration value closer to 1 shows high level of market concentration thus rendering the market less competitive. The level of concentration is determined not only by number of firms present but also by the size of the market.

Results and Discussion

Structure and of Rice Markets in Kano

The rice market structure is an important framework that gives crucial insight on how the rice market operates especially with regards to achieving a healthy competition among actors in the market. Market concentration influence price in the market (Kang, et al.,2009).

Table 2: Market Structure for Rice Retailers and Wholesalers (n=160)

Variable	Retail Frequency	Percentage	Wholesale Frequency	Percentage
No.of sellers				
10-20	00	0.0	42	73.7
21-50	09	7.2	10	17.5
51-90	41	32.8	05	8.8
91-150	75	60.0	00	0.0
Entry and Exit				
Absence of barrier	120	96.0	57	100
Presence of barrier	05	4.0	00	0.0
Product Differentiation				
Jamila	73	58.4	23	40.4
Jeep	27	21.6	11	19.3
Kwandala	15	12.0	13	22.8
Sipi	10	8.0	10	17.5
Relative Size(Bags)				
51-90	23	29.6	00	0.0
91-150	42	33.6	10	17.5
151-190	23	18.4	00	0.0
191-250	37	18.4	47	82.5
Source of Information				
Nearby Market	77	61.6	52	91.2
Market Officials	17	13.6	00	0.0
Media	12	9.6	00	0.0
Co-traders	19	15.2	05	8.8
Price of Rice				
Market Price	122	97.6	32	56.0
Market Officials	03	2.4	10	18.0
Comparing Market price	00	0.0	15	26.0

Source: Field Survey, 2014

Number of sellers

Number of sellers is a feature that characterizes the number of people that sell in the market which determines the market supply. Market supply increases when the number of sellers increases (Beggs, 2013). The result in table 2 shows 60% of retail rice sellers fall between 91-150 while that of wholesalers fall between 10-20. It is clear from table 2 that rice retailers are larger in number than wholesale rice sellers. In other words, people do not engage more in rice wholesale business as in the retailing business.

Relative Size (Bags)

The result in Table 2 above shows that 33.6% of rice retailers strongly believe that size of rice bags handled in the rice market range between 91-150. 29.6% respond to having a range between 51-90. While 18.4% believe the size of bags handled range between 151-250. Table 2 also shows that 82.5% of the rice bags handled by wholesalers range between 191-250 in the market. Only 17.5% believe that rice bags handled range between 91-150. Although not many people in the market engage in rice wholesale business due to the capital intensive nature of the business, wholesalers still handle large number of rice bags because they receive customers from within and outside the market.

Entry and Exit Behaviour

Table 2 reveals that 96% of the rice retailers believe that there are no entry restrictions whatsoever. 4% believe it is difficult to enter into the market. Barrier to entry and exit limits the number of sellers and buyers from entering and exiting the market. Wholesale rice marketers agree that there is 100% free entry and exit in the market without any form of restrictions.

Product Differentiation

Product differentiation is a feature that distinguishes the market from the type of product marketed. It is a feature used to gain an edge over competitors (Hawk, 2014). Different types of rice are sold in the rice market. From table 2, 58.4% of the retail rice consists of *Jamila* variety. *Jamila* is a local rice variety that has no much difference with imported rice when carefully packaged. It is preferred because it is a long grain variety and strong and doesn't break easily. Jeep variety (21.6%) is also marketed and liked by both sellers and buyers. *Kwandala* is another local variety that is sold by 12% of the respondents. The remaining 8% of the respondents went for Sipi variety.

In table 2, 40.4% of rice wholesale respondents market *Jamila* rice variety followed by Jeep (19.3%), *kwandala* (22.8%) and *Sipi* (17.5%).

Size of the Market

This is determined by the volume of sales in the market. From Table 2, 33.6% of retail rice marketers consider the rice market as fairly large while 29.6% believe the market to be a large one. 18.4% went for small and fairly small. In every case, this shows that the market size for rice is large enough due to the number of buyers and sellers that engage in exchange. Furthermore, table 2 reveals that 82.5% and 17.5% agree the market is large and fairly large respectively. This is evident as wholesale entail large amount of sales and therefore engages in large marketing activity in the market.

Source of Information

Table 2 shows that 61.6% of the retail rice marketers get market information concerning their products from nearby market. 13.6% from market officials, 9.6% get information through media source while 15.2% source their information from co-traders. Source of market information is an important element in determining the market structure and therefore it defines how the market operates. Through a reliable source of information, sellers become more confident on the prevailing price that guides them in determining the price of rice.

Table 2 shows also that 91.2% of rice wholesalers mostly rely on nearby markets as their source of information. Only 8.8% believe to source their information about the market from co-traders. In both situations, the rice marketers, in most cases, have a market that guides them in determining price and therefore it becomes their major and most reliable source of information.

Analysis of Market Concentration

This explains those market features that influence the nature of pricing and competition within an industry. Therefore, this feature may be used as a measure of competition depending on the number of sellers operating in the market. Several analysis can be used to measure for market concentration. The study used the Gini coefficient to assess the level of inequality present or otherwise using a measuring scale of between 0 and 1

Table 3: Gini coefficient analysis for retail rice marketers

Retailer	Proportion	Cumulative Proportion (X_k)	Quantity of Rice Sold	Quantity of Bags	Market Share (Proportion of Sales)	Cumulative Market Share (Y_k)	X_k - X_{k-1}	Y_k + Y_{k-1}	(X_k - X_{k-1})(Y_k + Y_{k-1})
0	0	0	0		0	0	0	0	0
47	0.376	0.376	4.12		0.296829971	0.296829971	0.376	0.296829971	0.111608069
38	0.304	0.68	2.99		0.215417867	0.512247839	0.304	0.80907781	0.245959654
21	0.168	0.848	2.06		0.148414986	0.660662824	0.168	1.172910663	0.197048991
11	0.088	0.936	2.04		0.146974063	0.807636888	0.088	1.468299712	0.129210375
8	0.064	1	2.67		0.192363112	1	0.064	1.807636888	0.115688761
125	1	3.84	13.88		1	3.277377522	1	5.554755043	0.79951585

$$G = \sum_{i=0}^{n-1} (X_k - X_{k-1})(Y_k + Y_{k-1})$$

$$= 1 - 0.80 = 0.2$$

The Gini coefficient for retail rice marketers was conducted to assess the market concentration. The result is expressed in Table 3.

The table shows that retail rice expressed low level of inequality of 0.2 among the distribution of the respondents. This implies that there is 20% inequality in size distribution of sellers' concentration. Thus, the market is 20% less competitive (Imperfect). In other words there is high level of competition in the retail rice market. This shows that a perfectly competitive market structure operates in the retail rice market. High level of competition allows effective operation of the market forces of demand and supply in the market in which case the price and quantity bought and sold in the market are at favorable condition for buyers and sellers. In other words, this opens more opportunity for potential marketers to go into retail rice marketing business.

Table 4: Gini coefficient analysis for wholesale rice marketers

Wholesaler	Proportion	Cumulative proportion (X _k)	Quantity of Rice Bags Sold	Market share (proportion of sales)	Cumulative Market share (Y _k)	(X _k - X _{k-1})	(Y _k + Y _{k-1})	(X _k - X _{k-1})(Y _k + Y _{k-1})
0	0	0	0	0	0	0	0	0
21	0.368421053	0.368421053	8,207	0.310201459	0.310201459	0.368421053	0.310201459	0.114284748
12	0.210526316	0.578947368	6,190	0.233964546	0.544166005	0.210526316	0.854367464	0.179866835
11	0.192982456	0.771929825	4,000	0.151188721	0.695354727	0.192982456	1.239520732	0.239205755
8	0.140350877	0.912280702	4,140	0.156480327	0.851835053	0.140350877	1.54718978	0.217149443
5	0.087719298	1	3,920	0.148164947	1	0.087719298	1.851835053	0.162441671
57	1		26,457	1		1	5.803114488	0.912948452

$$G = 1 - \sum_{i=0}^{n-1} (X_k - X_{k-1})(Y_k + Y_{k-1})$$

1 - 0.90 = 0.087

In Table 4, the Gini coefficient for wholesale rice marketers is 0.087. This implies that there is less than 1% (0.087%) level of inequality in the size distribution of wholesale rice sellers' concentration in the market. Thus the market is 0.087% imperfect which means that there is high level of competition among the wholesale rice sellers. It can be drawn from the analysis that wholesale rice marketing business promotes competition in the rice market hence attracting more buyers that will help maintain a competitive price level.

Conclusion and Recommendation

The study concludes that there is high level of competition in the markets. This is represented by the less < 1% level of inequality for both retailers and wholesalers in the rice markets. The market structure depicts many sellers in the market and size of the market is large which describes a perfect competitive market. Sellers are price takers and so price is determined through interaction between buyers and sellers. It is recommended that favourable market conditions should be improved such that more wholesalers will find it easier to join the rice market.

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