Economics of Swine Marketing in Kafanchan (Katsit) Market, Jama'a Local Government Area of Kaduna State, Nigeria.

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Target Audience: Policy makers, Researchers, Farmers, Swine Traders

Abstract

A market survey of 30 swine traders in Kafanchan was conducted to evaluate the structure, conduct and performance of the market. Although there were many sellers and buyers and no collusion, Lorenz curve analyses showed that 30% of all traders handled 74% of the sales. The Gini coefficient was also high (0.53), indicating gross inequality in size distribution and seller concentration, hence oligopoly. Analyses also showed that the market is vertically integrated. Cost of transportation (N100/animal) was the highest of the marketing services, representing 50.4%. Total cost of marketing services (N198.26/animal) was a small proportion (6.5%) of final sale price. Estimated gross margin was N742.36/animal) which was 24.2% of the sale price. The only element of barrier that existed was the high operating capital required. Price determination was by haggling and no standardization of product existed. The need and means of improving the nature of competition are highlighted.

Key words: Swine, market structure, conduct, performance, barrier.

Description of Problems

Swine marketing in Nigeria is dominated by live sales and largely controlled by middlemen. Participation of any modern entrepreneurship in actual trade is limited to only very few government-owned limited liability companies which control a negligible proportion of the trade. Most of these firms are beset by poor performances.

Specific ways in which efficient marketing systems play a leading role in economic development have been widely documented (1,2). Essentially, it is within marketing systems that prices are generated and the allocation of resources, income distribution and capital accumulation are determined. It is therefore of great importance for researchers in developing countries to provide adequate information on the efficiency and constraints of the marketing systems on which effective policies and strategies can be based. Empirically, this is often done by comparing characteristics of a given system with those of a perfectly competitive market model. This approach is utilized in this paper.

It was noted that indigenous marketing systems in developing countries are generally exploitative, collusive and economically inefficient (3). The extent to which this assertion is true for swine marketing in Nigeria is uncertain, for the state of knowledge on livestock marketing largely comes from studies on cattle (4,5), poultry (6, 7), sheep and goat (8, 9, 10). There is dearth of literature on swine production and marketing. Studies by (11, 12) constitute the only description of traditional Nigerian pig production especially in the north. Where literature exists on swine

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marketing, it is limited to swine market and marketing channels (13). In-depth analyses of the nature of competition of swine markets and marketing functions are rare, but they are essential for objective and reliable assessments of market performance and the consequent formulation of policy guidelines. This study focuses on the Kafanchan swine market to examine its structure and conduct, and to assess the degree of oligopoly and collusion if any; identify major functions performed and associated costs; estimate gross margin to traders and make relevant policy suggestions.

Materials and Methods

The study area

The study was conducted in Kafanchan, Jama'a Local Government Area of Kaduna State. The location was specifically chosen for several reasons. Firstly, the region is known for its high pig production in Nigeria. Out of the total of 2368 farm families identified in Jama'a LGA, 1804, representing 76%, rear pigs (14) and secondly, the area is a known potential swine market in the country. The Kafanchan weekly swine market is the largest of its kind in Nigeria. The market is located in Aduwan and Katsit on the outskirts of Kafanchan town. The market serves the surrounding towns of Kwoi, Manchok, Kagoro, Zonkwa and Kachia in the southern part of Kaduna state. The Kafanchan swine market has remained an important swine market centre since colonial days. At the time of this study, available infrastructure at the site included an open space with holding pens, few sheds and water facilities.

Sampling technique and size

The list of swine traders in the Kafanchan market was obtained from the market officials. The population of registered traders obtained from the officials was 92. On the basis of the traders' population frame, 30 traders were randomly selected and interviewed. This represents about 33% of the total swine traders in the market.

Data collection

A survey involving 30 pig traders was conducted from November 2000 – April 2001. Structured questionnaires and oral interviews were used to collect data on marketing channels and weekly pig sales, type of marketing services and their costs, transportation means and membership of pig trade association. These data were supplemented with participant observation of exchange activities in the market.

Analytical techniques

Analysis of distribution of traders was done using the Lorenz curve and the Gini coefficient to measure the degree of inequality and seller concentration. This analytical tool has been employed by various researchers in empirical studies of income distribution, wealth distribution and oligopoly (15, 16). The Lorenz curve was obtained by plotting the cumulative percentage of traders from $0 - 100$ on the horizontal axis against the corresponding cumulative percentage of trade in weekly pig sales on the vertical axis. The line of equality is a 45° diagonal line through the origin and the point on the X, Y axes. The further away an observed Lorenz curve is from X, Y axes, the more unequal is the distribution of sales. The two axes, horizontal base line and right-hand vertical, represent perfect inequality.

While the Lorenz curve represents a discernible visual picture of inequality, it does not give precise measures. A more precise quantifiable measure of inequality and degree of concentration is the Gini coefficient; this is the area between the equality line and the observed Lorenz curve expressed as a proportion of the area of the isosceles right triangle under the same line of equality. A coefficient of value of zero represent perfect equality (or low concentration) while unity represent perfect inequality (high concentration).

The formula for estimating Gini coefficient can be specified as:

$$G = 1 - \Sigma(X_i - X_{i-1})(Y_i - Y_{i-1}) / 10,000$$

Where:

G = Gini coefficient

X_i = Cumulative percentage of traders

Y_i = Cumulative percentage of swine

Two weaknesses of the method are the absence of straightforward algebraic formulae for computation, and the presence of systematic bias. It has been noted elsewhere that the more

observations there are available, and the more evenly they are spread along the Lorenz curve, the smaller the bias in the value of the coefficient. Data for decile classes usually have less bias than other forms of ordinary groupings. For this reason, decile classification was adopted for computing the coefficient in this paper.

Other analyses done in this study include per animal unit costs of all identified marketing services, average gross margin to swine traders, operating capital, descriptive statistics on means of transportation, membership of association, categories of buyers, seller-seller and seller-buyer relationships. Narrative discussion on other observed situations was also done.

The gross margin (GM) is the difference between the gross farm income (GFI) and the total variable cost (TVC). Thus, GM = GFI - TVC

Results and Discussions

Vertical integration in the market

Analysis revealed that 18(60%) out of 30 swine traders sampled were swine producers. While the remaining 12(40%) were only buyers who assemble to sell in the Thursday weekly market at Katsit (Kafanchan). The market could therefore be said to be vertically integrated since majority of the respondents coordinate production and marketing decisions in the industry.

The marketing channel

Most of the traded swine brought to the Kafanchan market are from pig farmers living in Kafanchan and the surrounding villages. At village levels, itinerant traders visit the homes of pig farmers to buy animals in small numbers such as one or two. They are then sold at local village markets to intermediate traders who are assemblers with more funds and capacities for bulking larger

numbers. These intermediate traders visit similar smaller markets such as Zonkwa and Samaru markets and gradually build up a herd for sale in the Kafanchan market. Ownership of pigs may in some cases change hands two or three times before reaching Kafanchan, while in other cases it may be a direct supply from buyers at the village to the Kafanchan market.

Traders themselves rarely own vehicles for transportation, they use the services of other transporters. Transportation of animals to markets is usually by trucks. In some cases animals are trekked from neighbouring villages directly to the Kafanchan market. Two principal buyers in the Kafanchan market are wholesale traders who take animals to the south and the local butchers who slaughter for fresh-pork sales in open markets both in Kafanchan and in the neighboring villages. In addition to these, some traders buy for resale either immediately or after some minor fattening operations. Direct purchases by some hoteliers for slaughtering also occur. Some pork consumers purchase pigs co-operatively for slaughter and distribution among the group members.

Market structure and seller concentration

Data on the size distribution of traders are presented in Table 1, and were used to draw the Lorenz curve of Figure 1. The computed value of the Gini coefficient was 0.53 (Table 2). The results show marked inequality in size distribution and seller concentration. For example in the 7th decile class (Table 1), 70% of all traders had 26% of the total weekly swine sales, which implies that 30% of them handled 74% of the sales. At the point furthest from the observed Lorenz curve to the equality line (Figure 1), indicated by A, 68% of the traders had about 24% of the swine sales, or 32% had about 76% of the sales.

Table 1: Lorenz curve data for distribution of trade in swine among swine traders, Katsit market, Kafanchan, 2000-01

Traders (%)	Swine bracket	Weekly swine sales (%)	Cumulative percentage of traders	Cumulative swine sales
0	0	0	0	0
10 (Lower decile)	1-2	0.29	10	0.29
10 (2nd decile)	3 – 4	0.75	20	1.04
10 (3rd decile)	5 – 12	1.80	30	2.84
10 (4th decile)	13 – 20	3.64	40	6.48
10 (5th decile)	21 – 27	5.22	50	11.70
10 (6th decile)	28 – 30	6.10	60	17.80
10 (7th decile)	31 – 47	8.54	70	26.34
10 (8th decile)	48 – 117	18.86	80	45.20
10 (9th decile)	118 – 130	26.64	90	71.84
10 (10th decile)	131 – 138	28.17	100	100.00

Table 2: Data procedure for estimating concentration (Gini coefficient) ratio for trade swine distribution among traders, Katsit swine market, Kafanchan, 2000-01

Percentage of traders (X)	Percentage of swine (Y)	Cumulative percentage of traders (Xi)	Cumulative percentage of swine (Yi)	Paired sums of (Yi) (a)	Trapezoidal area (X) x (a) (b)
0	0	-	-	-	-
10	0.29	10	0.29	0.29	2.90
10	0.75	20	1.04	1.33	13.30
10	1.80	30	2.84	3.88	38.80
10	3.64	40	6.48	9.32	93.20
10	5.22	50	11.70	18.18	181.80
10	6.10	60	17.80	29.50	295.00
10	8.54	70	26.34	44.14	441.40
10	18.86	80	45.20	71.54	715.40
10	26.64	90	71.84	117.04	1170.40
10	28.17	100	100.00	171.84	1718.40
Total	-	-	-	-	4670.60

Gini coefficient = $1 - 4670.6 / 10\,000 = 0.53$.

Although in absolute terms there are many sellers in the swine market, the true structure is not competitive but is oligopolistic, for only a few handle the bulk of the trade. By our assumed model, a non-comparative structure implies a poor market performance, but it is of interest to note that the result shows that the swine market is more competitive than obtains in small ruminant wholesaling and retailing in Imowo market, Ogun State of Nigeria (8) obtained Gini coefficient of 0.56, compared with the value of 0.53 for the Kafanchan swine market in this study. Their result showed higher seller concentration and hence poorer competition; regional differences may be involved.

Generally, proponents of large scale firm operations have argued in favour of higher seller concentration in relation to competitiveness where economic growth in firms will lead to elimination of inefficient small-scale firms (17). The tenability of this argument would depend largely on the empirical evidence of a given market where the existing large holders are not exploitative but more efficient than the small holders. Where this empirical evidence is not available we may conclude that there is need for improvement in the nature of competition for better performance in swine market.

Marketing services, costs and gross margins

Results of various marketing services, their costs and relative percentage are summarized in Table 3.

Table 3: Marketing services and their cost, Kafanchan 2000-01.

Item	Cost per animal (₦)	% of Total cost
Transportation/ handling	100	50.44
Feeding	20.26	10.22
Security/guard	5.00	2.52
Selling agents	30.00	15.13
Broker agent buying (Dilali)	33.00	16.64
Inspection (tapeworm)	10.00	5.04
Total	198.26	100.00

Cost of transportation/handling (₦100 / animal) was highest, representing 50.44% of the total cost of marketing services. This may not be too surprising because of the problem of cultural and religious taboo which hinder some vehicle drivers carrying swine, coupled with the bad roads and cost of fueling the vehicles. However, the share (la'ada) going to some commission agents, particularly the brokers (dilalai), ranked next. This fee, called "la'ada", is equivalent to a seal or receipt for concluded transaction. This fee which is paid by the buyer above the agreed sale price is shared among market agents who witnessed and participated in the bargaining process. The selling agents provide information, negotiations and sometimes provide the utility of risk-bearing.

The total cost of marketing services (₦198.26 / animal) was a small proportion (6.5%) of the final sale price of swine at Kafanchan market. Estimated average gross margin was ₦742.36 / animal or 24.2% of the sale price at Kafanchan representing returns to the trader's own labour, management and operating capital. These figures suggest that the trader's market share is high in relation to the services being provided.

The relative importance of various means of transportation was also investigated and the results summarized in Table 4. No rail transportation was observed. Transportation by trucks was virtually the major means of moving swine despite its much high cost (₦110 / animal) when compared with hoof transportation (₦35.46), indicating that the opportunity cost of hoof transportation, probably in terms of time, weight loss and risk, is higher than trucking. The choice of transportation can be influenced by the distance from the origin to the market. Transportation cost which influence effective marketing was found to be a problem among the traders. Poor roads and incessant increase in fuel prices contributed to the high cost reported by the traders. Certainly, with an improved road system, the rates of turnover will be far higher for truck transportation than for hoof (Table 4).

Table 4: Means of transporting swine to the Katsit market, Kafanchan, 2000-01.

Item	Truck	Hoof
Number of traders	23	7
Percentage of traders	76.67	23.33
No. of animals	28,989	5,765
Percentage of animals	83.41	16.59
Average transport cost, including loading and offloading (Naira / animal)	110.00	35.46

Market barriers

Some barriers to entry to new or prospective traders were investigated. These were the size of operating capital and the activities of trade associations. The estimated mean value of operating capital was ₦6,048/ trader / week; the value for the biggest trader in the sample was ₦112,023 / week. The implication of this is that traders with less than the mean operating capital of ₦6,048/week may be out of business except they have access to credit facilities.

For trade unions (union activities) only 26.7% in the sample were members and there was no indication of strong union activities. Thus, the only barrier to entry is monetary in relation to the size of the operating capital which was high and not affordable by many. It may therefore be expected that provision of credit facilities to small traders will improve the nature of competition.

Exchange functions and price determination

Two different sale agreements were noted between buyers and sellers depending on the existing relationship between the parties. While most of the traders sampled (63.3%) generally sold on the basis of cash and carry condition, some sold on credit. Most of the traders that sold on credit had regular buyers. Sales on the market are through the usual haggling over prices without weighing the animals or any other standardization. Product differentiation was in the form of visual assessment of animal size, health and condition score. These findings conform to a report on a study of goat marketing in Zaria,

Kaduna State where the price of goats depends on different groups of factors, such as sex, visual appraisal of size and age (10). Analysis revealed that another group of factors found to affect swine prices were seasonality and festivals. Swine prices are generally expensive in the dry season when Fulani herdsmen have moved to the wet areas of the south, and are away from the north. This creates partial scarcity of cattle leading to higher prices of swine and pork. When Fulani herdsmen return to the north at the beginning of the rainy season, cattle and goat prices fall due to excess supply. Prices are lowest between January and March. In the months of November, December and April swine prices are high as these months correspond to the festive periods of Christmas and Easter respectively. This suggests that marketing of swine in the study area is still largely determined by factors which at best of times, would tend to encourage pricing inefficiency. Hence key factors in swine pricing can be readily manipulated by market participants especially sellers. During pricing, other buyers and sellers could contribute in the estimation in order to arrive at acceptable prices for sellers and buyers.

Investigations on whether traders collude on price or number of animals to be sold were largely in the negative. Only 13.3% admitted discussing animal prices with co-traders and 76.7% never waited for any particular period of better prices before deciding to bring their animals to market.

For speculative marketing, 6.7% of the respondents bought and sold some animals at the same market. Hence collusion and speculative marketing are not serious problems in the Kafanchan (Katsit) swine market even though they are present. However, the absence of standardization and poor pricing allow a situation where swine prices do not reflect the source prices. This can lead to higher gross margins to traders than under competitive conditions. Also considerable time is wasted during price negotiations.

Conclusion and Applications

The need for some form of government regulatory measures of control of livestock marketing systems has been a subject of debate for some years now. The results of this study suggest that there are at

least two specific measures necessary for facilitating improved competition in the marketing system. These include:

1. the introduction of uniform grading systems; the need to develop and mass produce weighing scales to help in grading animals for correct prices;

2. an efficient marketing system is necessary to sustain an efficient production system in a market economy, hence the extension of credit facilities to farmers and marketers alike in order to facilitate swine marketing.

These two measures are the central issues in improving the Nigerian swine industry and until there is a regulatory body that can formulate, introduce and enforce them, there will not be any substantial improvement in the swine marketing systems.

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