STRUCTURE OF MAIDUGURI CATTLE MARKET, BORNO STATE, NIGERIA.

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ABSTRACT

Market structure is an important factor that influences the performance and efficiency of a market. The study aimed at determining the structure of Maiduguri cattle market. Primary data were collected, from questionnaires randomly administered to the respondents. Descriptive statistics was used to analyse product differentiation and market information. Gini coefficient was used to determine market concentration, while scale economics was used to determine case of/or barrier to entry or exist. The results showed that information transfer was timely and satisfactory and some degree of product differentiation exist in the market. Cattle are differentiated in terms of age, breed, weight and sex. The concentration of sellers is low while entry is free. The market is thus an imperfectly competitive market of oligopolistic nature.

INTRODUCTION

Structure of a market consists of characteristics of the organization of the market which seems to influence the nature of competition and pricing within the market, particularly the degree of seller and buyer concentration, entry condition, the extent of agents and product differentiation, the distribution of market information and its agency in sharpening price and quality comparisons (Harris, 1993). These structural characteristics are therefore, used as a basis for classifying markets. Markets may be perfectly competitive, monopolistic or oligoplistic. The ideal market structure for optimal efficiency is pure competition. A market is said to be competitive when there are many buyers and sellers, free entry conditions, high degree of price competitions and perfect market knowledge.

The major structural features of livestock and grains markets in Nigeria are lack of price information to buyers and sellers, high number of buyers and sellers, free entry conditions and low degree of price competition (Abu et al., 1996; Okereke and Anthonio, 1988). These suggest that the markets are under-developed. This under-development can be improved with increased production and efficient marketing of agricultural products. The Maiduguri cattle market is one of the largest in the country and it serves as a producing as well as transit market for livestock especially cattle (Balami et al., 1999). Though some research have been conducted concerning trading of cattle in the market, only few involved structure of the market in particular, therefore the need for this study.

Objectives of the study

The study aimed at determining the structure of main cattle market in Maiduguri. Specially, the study sought to determine and describe the structure of the market in terms of degree of buyer and seller concentration, product differentiation, case of or barrier to entry/exit and market knowledge.

METHODOLOGY

Study area

Maiduguri the capital of Borno State is located in the North Eastern corner of Nigeria. It has 3 three main districts; Yerwa, Bolori and Gwange, and 15 wards. The climate is hot and dry for a greater part of the year with a short rainfall period of three months, from June to September. The Sahel vegetation consists of mainly Neem trees and a few shrubs. The major occupation of the people is farming. Crops grown include groundnut, cowpea, millet, maize and guinea corn while animals reared are cattle, sheep, goat and poultry. The main livestock market, Kasuwan Shanu, at Gamboru Ward serves as producing, trading as well as transit centre for livestock especially cattle.

Data collection

Primary data were collected from questionnaires administered to 43 respondents out of about 200 participants in the market. The questionnaires were administered to 14 wholesalers, 24 retailers (6 fatterners, 18 ordinary retailers), 4 market staff/workers and 1 butcher.

Data analysis
Market structure

The structure of the market was described based on findings on concentration, product differentiation, market knowledge and ease of/or barrier to entry or exit.

a.   Concentration

The Gini coefficient was used to determine the degree of market concentration of sellers in the market. The Gini coefficient was computed using the following formula after Okereke and Anthonio (1988):

$$G = I - \Sigma xy$$

Where:

G	=	Gini coefficient
X	=	Percentage share of each class of seller
Y	=	Commutative percentage of their sales

The Gini coefficient ranges from one to zero. A perfect equality in concentration (low) of sellers is expected if G tends towards zero, while perfect inequality in concentration (high) of sellers is expected if G tends towards one, if $G = 1$ market is imperfect, and if $G=0$ market is perfect and competitive.

b.   Product differentiation

Simple percentage and descriptive statistics was used to classify cattle into different classes of age, weight, breed and sex.

c.   Ease of/or barrier to entry or exit

In a perfectly competitive market, there is case of entry on exist by sellers. The market becomes imperfect when seller concentration is not even (imbalance).

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Scale economics is the measure that was used to determine entry and exit conditions in the market. The model for this is the linearlized double log function. This was obtained by running a regression of quantity sold against cost according to (Pomecroy and Trinidad, 1995):-

Log $Y = b_o + b_1 + e$

Where:

Y = Total cost of marketing per class of seller per week

X_1 = Number of cattle sold per week

b_o and $_1$ are coefficients

e = Error term

If the coefficient of b_1 is negative, it means as quantity increases, cost decrease. This increase in cost could form barrier to entry especially by sellers that are not financially sound.

d. Market knowledge

For a perfectly competitive market to exist both buyers and sellers must have perfect knowledge on market conditions which will enable them (buyers and sellers) make rational decisions about market prices and product quality (Olukosi and Isitor, 1990). Descriptive statistics was used to determine respondents' perception about price information in the market.

RESULTS AND DISCUSSIONS

Concentration

The Gini coefficient for wholesalers, (.45) retailers (.46) and cattle fattener (.35) tend towards zero, this shows that there is some degree of equality in concentration of wholesalers, retailers and cattle fatteners in the market. These low Gini coefficients also indicate that the concentration of sellers is low. But more retailers than wholesalers, the Gini coefficients for retailers (.46) and wholesalers (.45) confirm this observation. This low seller concentration of firms (sellers) in the market is an indication that the market is competitive.

Market information

The major form of information transfer amongst sellers, and between sellers and buyers is personal contact. According to all sellers, information transfer concerning prices is timely and satisfactory while it is not satisfactory to buyers. Sellers are informed of change in prices through the chairman of cattle traders (after meeting with some traders of the group). But buyers only receive information on price changes from sellers in the market (at the point of purchase).

Reponses from respondents showed that information transfer is greater amongst sellers than between sellers and buyers. The transfer of information helps sellers know (decide) when to increase or decrease prices and what category of cattle to purchase from producers (farmers) while buyers would decide whether to buy or not (Azzam, 2003). All sellers (100%) agree that information transfer is timely and satisfactory (Similar to Jones, 1993).

Product differentiation

Some degree of product differentiation exist in the market. Cattle are differentiated in terms of age, breed, weight and sex.

Note: All sellers deal with cattle only.

a. Age

In the market, cattle are grouped into four age groups: A,B,C and D.

Table 1: Age classification of cattle in the Maiduguri Cattle Market.

Groups	Age (yrs)	Class of age	Percentage
A	1 – 2	Very young	5%
B	3 – 4	Young	30%
C	5 – 8	Middle-aged	45%
D	9 and above	Old	20%
Total			100%

Source: Field Survey, 2003

All sellers 100% agree that group C cattle are more marketable and have a higher price than groups A,B, and D. This is due to their ability to outstand stress, good body size and they are in their full (prime) growth period. Cattle fatteners showed their preference for group C cattle due to their growth potential, high feed conversion efficiency, strength and good body size.

Groups A and D cattle have a lower preference than B and C. Group A cattle are smaller and less fleshy, but there may be differences in the sizes of animals of different breeds that belong to this group. For example, Ambala calves are bigger than Mbororo claves. Group B cattle have good sizes but have not gained full growth and maturity. Group D cattle are less stronger, have stiff and skinny body and lower price.

b. Breed

Table 2: Breed classification of cattle in the Maiduguri Cattle Market

Breed type	Percentage
Ambala	50%
Mbororo	30%
White Fulani	20%
Total	100%

Source: Field Survey, 2003

The most commonly found breed in the market is the Ambala breed (about 50% of total cattle population in the market). It is characterized by fine whitish milky coloured skin, very short thick horns, large size, heavy weight, high feed conversion efficiency, and fast growth rate.

Other breeds found in the market are White Fulani (20% of cattle population) and Mbororo (30%) of cattle population). The white Fulani is characterised by its white skin, long slender horns, tall height, heavy weight, big size and strong body conformation. The Mbororo is characterized by its red (or black) skin, tall height, big long horns, heavy weight and strong body conformation. Both white Fulani and Mbororo grow fast but they have a lower feed conversion efficiency than Ambala. This is why sellers (especially fatteners) prefer Ambala to other breeds in the market. Therefore, Ambala has the highest marketing ability compared to other breeds.

Responses from respondents show that wholesalers deal with all breed types with a high proportion of Ambala (60-70% of the cattle they handle). But retailers handle more of Mbororo and white Fulani (70-80% of the cattle they handle) than Ambala because Mbororo and white Fulani are cheaper than Ambala and consumers and butchers usually prefer the cheaper breed. The description suggests that all breed types are marketable.

c.   Weight

Weight differentiation is one of the most important determining factors of price variation. Weight is determined by physical examination (no scales used). These physical features include skin smoothness/roughness, skin brightness/dullness, and body muscular conformation. Well fed and healthy animals have a shiny skin and strong body conformation while poor animals have shocked, rough, dull skin and weak (poor) body conformation.

Cattle are differential into three main weight groups, given with proportion:

Table 3: Weight classification of cattle in the Maiduguri cattle market.

Groups	Class of weight	Percentage
A	Very skinny-slim	20%
B	Moderate-big	70%
C	Very big and heavy	10%
Total:		100%

Source: Field Survey, 2003

From the responses of the respondents about 85% of group B are transported to the south and east while the remaining 15% and those of group A are sold to butchers and local buyers.

60% - 70% of (all wholesalers and a few retailers) sellers prefer group B cattle due to the good body size and weight, moderate price and high marketing ability (especially when taken to the west and east). While 20% of sellers prefer group A cattle and about 10% of sellers deal with group C cattle. Group A are the cheapest due to their poor size and weight. Group C are only found in the fatteners' sheds. They are very expensive, due to the high cost involved in their feeding and keeping. However, all the three groups of cattle are marketable.

d.   Sex

Responses from sellers pointed out that sellers (except cattle fatteners) refer to sex differentiation as a tertiary factor for selection or marketing. Retailers, wholesalers and buyers are only interested in the health, size, weight and strength of animals. Cattle fatteners have high preference for bulls than cows because they claimed bulls are heavier, stronger and grow and fatten faster than cows.

It was observed that both bulls and cows of a particular breed are typical of the breed, they only differ in height, weight and size (bulls more than cows). The difference is usually negligible especially when comparing bulls and cows the same. All sellers 100% handle both sexes and buyers may buy bulls or cows depending on the need for the cattle.

e.   Other physical features

Other physical features examined by sellers and buyers are the eyes, ears and nose. These features are used to detect health status of animals.\

Diseased animals are recognized by their red eyes, dropping ears and dried nose (which moves frequently) while healthy animals have white eyes, upward pointing ears and moist nose. Tagged nose is also a sign that the animal was well checked before arriving market, such animals are believed to have a fast growth rate. Sellers and buyers check these physical features before selling or buying.

Concentration

Table 4: Distribution of Wholesalers by Weekly Sales, Maiduguri Cattle Market, 2003

S/No.	No. of cattle handled/week	Average purchase price (pp) (₦) head	PP x No. of cattle handled = A (x1000,000) ₦	Average resale price RP/head (₦)	RP x No. of cattle handled = B (x1000,000) (₦)	B-A Profit (x1000,000) ₦	% Share X	Cumulative % Y	XY (x.0001)
1.	30	35,000	1,050	52,000	1,560	.510	1.045	1.045	.000109
2.	50	35,000	1,750	55,000	2,750	1.00	2.049	3.094	.000634
3.	60	35,000	2,100	53,000	3,180	1.080	2.213	5.307	.001174
4.	80	35,000	2,800	55,000	4,400	1.600	3.279	8.586	.002815
5.	100	35,000	3,500	53,000	5,300	1.800	3.689	12.275	.004528
6.	120	35,000	4,200	50,000	5,880	1.680	3.443	15.718	.005441
7.	150	35,000	5,250	50,000	7,350	2.100	4.303	20.021	.000862
8.	180	35,000	6,300	51,000	9,180	2.880	5.902	25.923	.015230
9.	200	35,000	7,000	52,000	10,040	3.400	6.967	32.89	.022914
10.	250	35,000	8,750	53,000	13,250	4.500	9.221	42.111	.03883
11.	300	35,000	10,500	55,000	16,500	6.00	12.295	54.406	.06689
12.	330	35,000	11,550	55,000	18,150	6.600	13.525	67.931	.09188
13.	450	35,000	15,750	52,000	23,400	7,650	15.676	83.607	.13106
14.	500	35,000	17,500	51,000	25,500	8.000	16.393	100	.16393
Total	2800	35,000	17,500	51,000	25,500	48,800	16.393	100	.55405

Source: Field survey, 2003

$$G = 1 - \Sigma XY$$
$$= 1 - .55$$
$$= .45$$

Concentration
Table 5: Distribution of Retailers by Weekly Sales, Maiduguri Cattle Market, 2003

S/No.	No. of cattle handled/week	Average purchase price (pp) (₦) head	PP x No. of cattle handled = A ₦	Average resale price RP/head (₦)	RP x No. of cattle handled = B (₦)	B-A Profit ₦	% Share X	Cumulative % Y	XY (x.0001)
1.	2	25,000	50,000	28,000	56,000	6,000	1,639	1,639	.00268
2.	6	20,000	120,000	24,000	144,000	24,000	6,557	8,196	.00537
3.	6	30,000	180,000	33,000	198,000	18,000	4,918	13,114	.00645
4.	3	18,000	54,000	22,000	66,000	12,000	3,279	16,393	.00538
5.	3	9,000	27,000	12,000	36,000	9,000	2,459	18,852	.00464
6.	2	10,000	20,000	13,000	26,000	6,000	1,639	20,491	.00336
7.	4	15,000	60,000	18,000	72,000	12,000	3,279	23,770	.00758
8.	5	10,000	50,000	12,000	60,000	10,000	2,732	26,502	.00724
9.	3	20,000	60,000	24,000	72,000	12,000	3,279	29,781	.00977
10.	6	22,000	132,000	25,000	150,000	18,000	4,918	34,699	.01706
11.	5	25,000	125,000	28,000	140,000	15,000	4,098	38,797	.01590
12.	6	15,000	90,000	17,000	102,000	12,000	3,279	42,076	.0138
13.	8	22,000	176,000	25,000	200,000	24,000	6,557	48,633	.0319
14.	10	20,000	200,000	23,000	230,000	30,000	8,197	56,830	.0466
15.	11	20,000	220,000	24,000	264,000	44,000	12,022	68,852	.0828
16.	12	22,000	264,000	25,000	300,000	36,000	9,836	78,688	.07740
17.	12	25,000	300,000	28,000	336,000	36,000	9,836	88,524	.08707
18.	14	30,000	420,000	33,000	462,000	42,000	11,475	100	.1148
Total	118					366,000			.5398

Source: Field survey, 2003

$G = 1 - \Sigma XY$

$= 1 - .55$

$= .46$

Concentration

Table 6: Distribution of Cattle Fatteners by Weekly Sales, Maiduguri Cattle Market, 2003

S/No.	No. of cattle handled/ week	Average purchase price (pp) (₦) head	PP x No. of cattle handled = A (x1000,000) ₦	Average resale price RP/head (₦)	RP x No. of cattle handled = B (x1000,000) (₦)	B-A Profit (x1000,000) ₦	% Share X	Cumulative % Y	XY (x.0001)
1.	2	33,000	66,000	49,000	98,000	32,000	8,672	8,672	.0075
2.	1	9,000	9,000	23,000	23,000	14,000	3,794	12,466	.0047
3.	1	38,000	38,000	63,000	63,000	25,000	6,775	19,241	.0130
4.	3	40,000	120,000	66,000	198,000	78,000	21,138	40,379	.0853
5.	1	50,000	50,000	90,000	90,000	40,000	10,840	51,219	.0555
6.	6	30,000	180,000	60,000	360,000	180,000	48,780	100	.6538
Total	14					369,000			

Source: Field survey, 2003

$G = 1 - \Sigma XY$

$= 1 - .6538$

$= 0.35$

Ease of/or barrier to entry/exit

The regression result was:

$$\text{Log } Y = 4.621 + .938 \text{ Log } X_1$$
$$(.065)$$

$r^2 = 85.2\%$

$f = 206.80$

$t = 14.38$

The positive coefficient of X_1 (.938) obtained shows the absence of scale economies. This means the higher the cost involved the higher the number of cattle available and hence the higher the price. The absence of scale economies, also shows entry is free. (Detailed result shown in the appendix).

SUMMARY AND CONCLUSION

This study has reaffirmed that the Maiduguri cattle market is characterized by few sellers that are selling homogenous product (cattle), relatively free entry and exit and satisfactory transfer of information among sellers, thus the market is an imperfectly competitive market of oligopolistic nature.

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APPENDIX

RESULT

REGRESSION
Double-log
Variables entered/removed

Model	Variables entered	Variable removed	Method
1	X^n		Enter

a.   All requested variables entered
b.   B. Dependent variable; Y

Model Summary

Model	r	r^2 square	Adjusted r^2 squares	Std. Error of the estimate
1	$.923^n$	.852	.848	.3591

a.   Predictors: (Constant), X

ANOVA[b]

Model	Sum of squares	Df	Mean square	F	sig
Regression	26,665	1	26,665.129	206.800	000[a]
Residual	4,642	36			
Total	31,306	37			

a.   Predictors: (constant), X
b.   Dependent variable; Y

Model	Unstandardized coefficients		Coefficient standardized coefficients		sig
	B	Std. Error	Beta	t	
1	4.621	.095		48.876	.000
(constant) X	.938	.065	.923	14.381	.000