ECONOMIC EVALUATION OF AN ALTERNATIVE MARKETING SYSTEM FOR FEEDER CATTLE IN ALABAMA

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The marketing system for cattle in the United States has evolved with shifts from delivery to large terminal centers, to more decentralized markets. Because of innovations in transportation and processing technology, these structural changes have created a need for greater vertical coordination between different stages in the cattle marketing channels (Rhodes, p. 174; Sporleder, p. 101). Improved coordination requires appropriate market information about product supplies and the form of cattle preferred by buyers (Purcell, 1973, 1980).

Alabama is a major supplier of stocker and feeder cattle to feedlots in the Southwest, Midwest, and North Central regions of the United States. A need for greater coordination between cattle producers and cattle feedlot owners in various regions has become particularly evident. Most cattle are traded through small country auction markets, which can be thin markets having limited trading volume and illiquidity (Hayenga). The limited volume of cattle can lead to increased costs to buyers, who must visit several country auction markets to assemble enough cattle for a truckload to ship to a feedlot. Also, thin markets can result in the inaccurate or sluggish adjustment of cash prices, as supply and/or demand relationships change (Henderson and Baldwin).

This research focuses on evaluation of the performance of an alternative market system for feeder cattle that has developed in Alabama. The study measures the differences in prices received by producers selling in a special market board sale, compared to auction market sales. The study examines whether market boards have reduced the joint costs incurred by sellers and buyers of feeder cattle, compared to the auction market system. Relative to opportunities for further increases in market efficiency, information on cattle sold in both market boards, as well as auction markets, is examined. A better understanding of marketing factors affecting price received would improve coordination between buyers and sellers in the Alabama feeder cattle market.

DESCRIPTION OF MARKET BOARDS

In response to a need to offset the effect of high costs and low prices because of thin country auction markets, a group of livestock producers formed a market board association in 1973. The objective of the market board was to supply healthy, farm-fresh cattle at least cost direct to feedlots. In 1981, 6 market boards, composed of 86 producers, sold cattle valued at approximately $7 million. Sales occur during April and May at locations central to each group of producers. Cattle are auctioned by lots, with producers supplying a description of each lot to the buyers before a sale. Buyers have the opportunity to visit a farm to inspect the cattle before a sale. After the sale, the seller and buyer sign a sales contract and agree on the form of payment and the time when cattle are to be picked up at the farm.

METHODOLOGY

Market board sales and auction markets are the two market channels compared in this study. To compare benefits and costs, data from 15 board sales were collected from 1979 to 1981. Prices received by producers in each market board sale were compared to the respective weekly average market price for the Montgomery auction market reported by the Alabama Department of Agriculture and Industries. In the Montgomery market, there are two separate auction facilities that operate daily. The Montgomery market is a delivery point for the Chicago Mercantile Exchange's futures contracts on feeder cattle, and the market price is considered representative of national prices.

Data on marketing charges and fees were collected from the two auctions in Montgomery. Estimates of shrinkage and transportation costs in auction markets were obtained in discussions with order buyers in these markets. A questionnaire was mailed to producers in the associations to estimate their marketing costs. Statistical methods were used to test for differences between the two market channels.

To evaluate characteristics that influence the price of cattle, producers' description of 383 lots of cattle were regressed on price received for each lot for the period of 1979–81. Producers provided information on lot size, breed type, estimated delivery weight, sex, grade, time of sale,

and date of delivery. Prices received were deflated by a producer price index for feeder cattle based on 1967 real dollars (USDL).

To test if additional information, obtainable only if a buyer visits a farm, influences the price paid, 165 lots of cattle were selected and graded on the farm before the sales in 1980 and 1981. Each lot of cattle was scored on muscling, frame size, finish, age, defects, estimated weight range in the lot, uniformity in size of animals in the lot, accessibility, and show site of cattle on the farm. To test whether these same animal characteristics were consistent with those for cattle sold in auction markets, 282 cattle were graded at the Montgomery auction markets during the same weeks of the boards sales in 1981. Regression analysis was used to test for relationship between animal characteristics and the price received in each of the market channels.

RESULTS

Price Differences Between Market Channels

For the three-year period 1979–81, differences in the gross price received by producers between board sales and auction markets are listed in Table 1. The average price for cattle sold through board sales was $65.72 per cwt. For cattle in the same weight range and sex class at the Montgomery market, the price was $62.64 per cwt. The gross price difference of $3.08 per cwt was significant at the 1-percent confidence level.

To test whether the cattle sold in board sales

TABLE 1. Mean Prices and Costs for Feeder Cattle at Market Board Sales Versus Montgomery Auction Market, 1979–81

Revenues	Marketing Board Sales	Auction Market	Difference
		$/cwt	
Price Received	65.72	62.64	3.08**
Direct Costs			
Marketing Charge	.15	1.75	1.60
Shrink[a]	1.31	2.51	1.20
Insurance	--	.54	.54
Transportation[b]	--	.28	.28
Subtotal	1.46	5.08	3.62
Indirect Costs			
Assembling Cattle	.89	--	.89
Total Marketing Charges	2.35	5.08	2.73
Net Price Received	63.37	57.56	5.81**

[a] Four percent was used to calculate auction market shrink. This is considered a conservative estimate with shrink believed to range from 5–8%. Sellers in the associations take a 2% pencil shrink.

[b] Transportation charge from farm to auction market estimated at $2.00 per head.

** Significant at the .01 level.

were similar in quality and type to those sold in auction markets, cattle were graded on the farm and at the respective weekly Montgomery market during the 1981 sales. For a relative comparison, Angus and Hereford cross steers (Black Baldies) grading medium No. 1 were selected for analysis. The steers in respective weight classes in the board sales received $2.10 per cwt more than similar type and quality of steers sold in the Montgomery auction markets. This differential was approximately two-thirds of the gross price differential for all lots sold during the 1979–81 period. Cattle in the auction markets were sold singly or in small lots of less than five, while the average lot size of cattle in the board sales was more than fifty head. Difference in lot size could explain some of the remaining price difference between the two market channels.

Direct market costs for the two channels are illustrated in Table 1. The commission fee and shrinkage were the greatest factors in the difference in direct marketing costs. Auction markets charge 2.80 percent of the gross sale value per head in commission fees. Based on personal interviews with auction managers, a conservative estimate of 4 percent in liveweight shrinkage of cattle in the auction market was used. The producer selling in the auction market loses, on the average, $2.51 per cwt in the value of the animal marketed. Shrinkage and auction commission fees were 77 percent of the differences in direct marketing costs. The total direct marketing cost to producers using an auction market was approximately three and a half times the marketing costs of boards sales.

Assembling cattle for transport to feedlots is an important marketing function of commission-order buyers. In a personal interview of commission buyers in 1981, buyers reported visiting an average of two auction markets to obtain a truckload of cattle. The cost of assembling cattle passes from the buyer to the producer in the market board sales. Producers in board sales in 1981 were surveyed, and they estimated an average cost of assembling cattle on their farms of $6.10 per head, or approximately $.89 per cwt. The difference in total marketing charges, assuming assembling lots by producers, was $2.73 per cwt. The difference in net price received was statistically significant, implying technical efficiency increased by producers assembling large lots, compared to the cost to the commission buyers having to visit several auctions to obtain a truckload of cattle.

PRODUCER-SUPPLIED INFORMATION AND THE PRICE RECEIVED

Because an important function of board sales is assembling and selling cattle directly from the farm, a producer's description of each lot is cru-

cial to orderly and continued marketing of feeder cattle by board associations. Producers' descriptions for 383 lots of cattle were regressed on price received (Table 2). The model explained approximately 40 percent of the variation in price.

The number of head in a lot was found to have a positive effect on price paid. For each additional head in the lot, the price received increased $.002 per cwt. The dummy variable for truckload lots was not significant. The average lot size was 104 head for the period of 1979–81, therefore most buyers assembled at least a truckload, saving assembling cost for buyers. In a survey of buyers attending board sales in 1981, most said that they preferred lots of truckload size.

Buyers paid a premium for lots that were composed of a single breed type. Lots of cattle, homogeneous in breed type, received a $.51 per cwt premium compared to heterogeneous lots. The dummy variable for breed type compared lots on the basis of observed preference for British breeds. Lots of cattle with British breeds and their crosses received a $.75 per cwt premium, compared to lots with Brahma crosses. Buyers attending the association sales have shown a preference for British breeds because many of the cattle are shipped to the Midwest, where these breeds are preferred.

Lots of steers received a premium of $2.25 per cwt, compared to lots of heifers. Lots of higher average weight received a lower price, −$.01 for each additional pound. Because large-frame cattle tend to be heavier cattle, lots of cattle described as USDA large No. 1 received a $1.62 per cwt discount, compared to medium No. 1 cattle.

TABLE 2. Results of Regression Equation of Variables Influencing Price Per Cwt Received for Cattle at Board Associations, 1979–81

Variable	Estimate	Standard Error of Estimate
Intercept	28.30**	.99
Number of head in lot	.002*	.001
Truckload lots (yes = 1, no = 0)	.41	.26
Mix of breeds (homogeneous = 1, heterogeneous = 0)	.51*	.22
Breed type (British breeds crossed with exotics = 1, Brahma crosses with exotics = 0)	.75**	.25
Sex of cattle (steer = 1, heifer = 0)	2.25**	.27
Producer's estimated weight of cattle	−.01**	.001
Grade of cattle (USDA large = 1, USDA medium = 0)	−1.62**	.38
Time of sale		
April	−1.78**	.25
May 1-15	1.25**	.24
Number of weeks after sale for pickup	−.18*	.09
R^2 = .39		
F = 23.68**		

* Significant at the .05 level.
** Significant at the .01 level.

Board associations have their sales during April and May, and the time of sale was a factor influencing the price paid for cattle. Prices paid for cattle in board sales held in April and the first half of May were $1.78 and $1.25 less, respectively, than in sales held during the second half of May. The later the sale, the greater the opportunity for buyers from other states to attend Alabama sales. The fixed sale date for each association does reduce the flexibility to shift a sale to a temporary period of rising prices: this problem does not occur when selling is done through regular auction markets. Producers estimate the number of weeks after the sale when cattle would be available for pickup at the farm. Producers received $.18 per cwt less for each additional week after the sale that the buyer had to wait before taking delivery of the cattle. Timing of the sale and delivery of the cattle were important factors that significantly influenced the price received.

INFORMATION FROM FARM VISITS

Buyers have an opportunity to visit farms to view lots of cattle before a sale. For the 1981 sales season, each producer saw an average of eight buyers who visited the farm before a sale: buyers have a need to see lots before a sale. Information was collected on characteristics of 162 lots graded on the farm in 1980 and 1981. These characteristics were hypothesized to influence a buyer's opinion if a farm visit were made. Results of the analysis measuring muscling, body size, age, finish, defects, weight range, access to cattle, and show site on the farm are reported in Table 3. Variables in the model explained 9 percent of the variation in price.

The weight range in the lot was the only significant variable that influenced price. Buyers seemed primarily concerned with the dispersion in weights of cattle, especially in lots of large size. The price per cwt declined by $.003 for each pound of increase in the weight range. The average weight range for lots was 132 pounds, with the largest lot being 325 pounds. This fact was substantiated in a survey of commission buyers attending board sales in 1981, who said that actual average weights for lots of cattle were greater than producers' estimations. For 153 lots of cattle, the actual average weight was 742 pounds, while producers' estimated average weight was 702 pounds. The difference in the means was statistically significant at the 1-percent confidence level. It could be conjectured that buyers made farm visits mainly to certify what producers had reported and to check on weight range of cattle in a lot. Lot sizes for cattle were so large that animal characteristics within a lot would be highly variable, thus the important factor would be average weight.

TABLE 3. Results of Regression Analysis of Lot Characteristics from Farm Survey of Cattle Sold in Board Sales in 1980-81

Variable	Estimate	Standard Error of Estimate
Intercept	21.53**	1.24
Muscling	-.03	.19
Age	.05	.05
Finish	-.04	.39
Body size	.08	.20
Defects	.05	.17
Weight range	-.003*	.001
Uniformity in size	.34	.19
Access to view cattle	.34	.23
Show site for cattle	.12	.22
	R^2 = .09	
	F = 1.69*	

* Significant at the .05 level.
** Significant at the .01 level.

TABLE 4. Regression Analysis of Animal Characteristics on Price Received for 292 Lots at the Montgomery Market, 1981

Variable	Estimate	Standard Error of Estimate
Intercept	84.35**	4.12
Muscling	.17	.54
Finish	-3.62**	.72
Body size	-.35	1.16
Defects	.57	.67
Weight	-.01**	.002
Breed	.07	.39
Grade	-.03	.27
Sex	-6.86**	.55
Head in lot	-1.51	1.36
	R^2 = .46	
	F = 25.52**	

** Significant at the .01 level.

To determine if similar animal characteristics that influenced the price of cattle in board sales were consistent with cattle sold in auction markets, 282 head of cattle were graded in the two Montgomery auction markets in 1981. The regression model explained 46 percent of the variation in price. Variables of sex, weight, and finish of cattle were the only significant factors (Table 4). Steers received a $6.86 premium to heifers, which was closely equal to the differential for board sales of $5.85 per cwt, expressed in 1981 dollars. The inverse relationship between price and weight was consistent between the two types of sales. The finish variable implies that moderately fat cattle received a $3.62 premium over slightly thin cattle. In board sales, because of the greater variability resulting from the size of the lots sold, finish of cattle would be difficult to score definitively.

CONCLUSIONS

Marketing board sales for feeder cattle have become an established alternative system to auction markets in Alabama. Producers in board associations assemble large quantities of feeder cattle on their farms at a lower marketing cost than commission buyers would incur if they had to visit several auctions to obtain the same number of cattle. Feeder cattle, which are "farm fresh" and ready for the feedlot with minimum stress, receive a higher price than cattle sold through auction markets. After all costs, buyers received $5.81 per cwt more than cattle of similar quality sold in the Montgomery auction markets. Market boards were found to have increased the technical efficiency in marketing feeder cattle from production to finishing stage of marketing systems.

Information supplied by producers on lot size, breed type, mix of breed in lot, estimated delivered weight, sex, time of sale, delivery date after sale, and USDA grade of cattle significantly influenced price received for feeder cattle. Additional information obtained from a farm survey found that the greater the amount of weight variation in a lot, the lower the price received. Animal characteristics of sex and weight had similar effects on price received for cattle both in auction markets and board sales. The finish condition of the cattle in the auction market also had an important influence on price received. Because of the amount of variation within a lot, measure of finish was not significant for cattle sold in board sales. Vertical coordination between producer and buyers could increase if this information is assimilated by producers in choosing types of cattle to sell through board sales.

Market board associations have become a useful alternative market channel for feeder cattle in Alabama because of convenience and cost

efficiencies for producers and buyers. The problem of thin auction markets is alleviated when producers sell large numbers of cattle at one time. The need for greater vertical coordination between producers and buyers places emphasis on accurate market information. More research is needed on the appropriate type of market information and services that could enhance the marketing system for feeder cattle in Alabama and the southeastern United States.

REFERENCES

Alabama Department of Agriculture and Industries. "Weekly Livestock Market Reports." Livestock Market News Service, Montgomery, 1979, 1980.

Hayenga, M. L. et al. The Concept of a Thin Market," in *Pricing Problems in the Food Industry (with Emphasis on Thin Markets)*, NC-117, Monograph 7, Feb. 1979, pp. 7–13.

Henderson, D. R. and E. D. Baldwin. "Marketing Slaughter Hogs by Remote-Access Computerized Auction: Theory and Empirical Results." Paper presented at American Association of Agricultural Economics, Clemson University, July 1981.

Purcell, W. D. "An Approach to Research on Vertical Coordination: The Beef System in Oklahoma." *Amer. J. Agr. Econ.* 55(1973):65–68.

Purcell, W. D. "Symposium Wrap-up," in *Proceedings,* National Symposium on Electronic Marketing of Agricultural Commodities. Texas Agr. Exp. Sta., March 1980.

Rhodes, V. J. *The Agricultural Marketing System*. Columbus: Grid Publishing, Inc., 1978.

Sporleder, T. L. "The Feeder Cattle Segment," in *Proceedings* National Symposium on Electronic Marketing of Agricultural Commodities. Texas Agr. Exp. Sta., March 1980.

U.S. Department of Labor. "Producer Prices and Price Indexes." Bureau of Labor Statistics, June 1981.