A Comparison of Video Cattle Auction and Regional Market Prices

by

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Abstract

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The number of cattle sold through video auctions has increased dramatically during the past five years. This study examines price differences between the nation's largest satellite video cattle auction and two large regional auctions. A regression analysis determined the influence of lot characteristics, market information, and merchandising strategies on video auction prices. Video auction prices were equal to or greater than regional market prices. Also, pricing within a video auction was basically the same as traditional auctions.

A Comparison of Video Cattle-Auction and Regional-Market Prices

Increasingly, large numbers of cattle are being offered for sale through video auctions. For example, the Superior Livestock Auction (SLA), the nation's largest satellite video cattle auction, sold more than 270,000 head of cattle in 1987 and more than 350,000 head in 1988. Indeed by 1990, the SLA is projected to be the largest cattle auction of any kind (Scharlier).

Acceptance of any pricing method depends on the motivations of buyers and sellers (Buccola, 1980). Cattle sellers want the highest price available from a source that can be assured of contract compliance. If video cattle auctions are a high price, reliable market source, then sellers will seek this type of market. Through satellite video auctions buyers can bid from remote locations, which reduces the time and money required for travel. Buyer search time can also be reduced since large numbers of cattle can be offered via video cattle auction in a relatively short time. For example, SLA offered over 90,000 cattle for sale during a two-day auction in 1988 (Scharlier). Health problems are also reduced if cattle are not mingled with other lots and are only transported to one destination.

Despite these benefits, however, many buyers and sellers as well as institutions are concerned about the economic viability of the video auction as opposed to the more traditional auctions. For example, in 1986 the state of North Dakota refused a business license to the SLA because new cattle auctions could be licensed only if an economic need or benefit could be demonstrated. At that time no statistical evidence was available for analyzing either the efficiency or increased revenues associated with video

cattle auctions. In addition, buyers and sellers using video auctions are concerned about the accuracy of the video presentation and description, relative prices, buyer participation, and delivery of the cattle priced on the system.

Other studies have analyzed electronic marketing systems' potential impact on structure and relative prices (Sporleder; Sporleder and Mahoney; Ward; and others). However, no one has examined the relative prices and factors affecting prices in satellite video cattle auctions.

The purpose of this paper is to analyze the performance of the SLA during 1987. The analysis addresses concerns about relative prices between video cattle auctions and regional markets and also investigates the factors affecting prices in video auctions. Determining relative prices is accomplished by comparing the prices received for cattle using the video auction relative to large traditional regional auctions.

While video and traditonal auctions both employ similar bidding processes, there are important structural and informational reasons why prices for the two markets might differ. In addition to lower transactions costs, video auctions may provide buyers with more information about the history of cattle, type of feed, and vaccinations. than traditional auctions. Video auctions serve a larger geographic area and employ a blind (anonymous) bidding procedure. SLA held auctions only 14 times during 1987. Periodic sales increase the number of cattle offered at one time relative to the regional auctions and more buyers participate in the video auction. These factors may increase competition and consequently affect prices.

We also examine the components influencing prices in the SLA auction by regression analysis to determine if any differences in pricing exist

between video and traditional auction markets. Past research results are used to compare some of the general influences of lot characteristics, market information, and terms offered by the seller on prices in a video market relative to traditional auction markets. The following section reports the data source and methodology used to complete these analyses.

Data and Procedure

Data

Presentation of cattle for sale through a video auction consists of two components--the video or visual component and the sales catalogue or written component. Clarity and precision of these two components is critical if the cattle are to be represented adequately. While the importance of the quality of the visual presentation of cattle sold on video auctions was not possible to test, the seller's description and terms were available from SLA's sales catalogues.

Sales catalogue descriptions prepared by the video auction company and the seller are developed when the cattle are videotaped. A $2.00 taping fee is included in the sales commission unless the seller rejects the bid, in which case the seller forfeits the taping fee. Videotapes are edited to a length of about two minutes and are shown in sequence by lot number during the video sale. An auctioneer solicits bids from buyers as the videotapes are played. Buyers may bid either in person or by telephone (if viewing the satellite transmission in a remote location).

Buyers register with SLA prior to the sale and receive a buyer's number after credit has been established. Blind bidding is employed by the video auction according to buyer numbers rather than names. Sellers may specify reservation prices if they wish.

The 1987 sales catalogue data and accepted bid prices for each lot of cattle were gathered from the SLA in Brush, Colorado. In 1987, more than

335,000 head were offered for sale via 14 satellite video cattle auctions (See Table 1). Eighty-one percent of the cattle offered for sale were sold and were shipped an average of 471 miles for delivery. Sellers from over 20 states offered cattle for sale, with sellers in Texas and Colorado offering the most, 113,835 and 53,878 head, respectively.

Price Differences Between Markets

Feeder cattle prices vary among locations, delivery dates, qualities and trading agreements such as weighing conditions[1] and pencil shrink (Schroeder et al.). Comparisons between prices received on the SLA and traditional markets need to account for these influences.

Since more public information is available for individual lots of cattle sold through the video auction than lots sold at regional auctions comparisons become more difficult. For example, estimating price differences among video sales and local and regional markets is complicated by USDA's price-reporting methods. Major regional market prices for feeder cattle are reported either as price ranges or the midpoint of the price range for the day or week for weight increments of 100 lbs. Also, no price distributions within the increments or quality differentials are reported. The video auctions sales catalogue contains a detailed description of each lot's characteristics and prices can be obtained from SLA (Figure 1).

We compared the midpoint price for the highest volume day of the week for two major regional auctions to the SLA prices. Since the midpoint price for the major regional auctions does not account for any quality differentials, we also conducted a sensitivity test by comparing the reported high price of the market range for the regional auctions the same day. This assumed that the average quality of cattle sold through the

video auction might be higher than those sold through the regional auctions (e.g., due to sorting) but that average quality of feeder cattle in the video auction would probably not exceed the highest quality offered in the regional auctions.

Prices in the different markets were adjusted using relative shipment and commission costs to account for locational differences. These adjustments were done by subtracting potential shipment and commission costs for each pricing method (video or regional auction) from the price at each location before comparisons were made.

The seller would pay all shipment costs to a regional auction (shrink and trucking) but pencil shrink is offered to buyers in a video auction since the buyer is responsible for transportation costs. Pencil shrink is a percentage reduction in weight designed to partially compensate the buyer for weight loss (shrink) incurred during shipment and handling. Pencil shrink is established by the seller prior to the video auction and is listed in the sales catalogue for each lot of cattle (see Figure 1). Thus, in a video auction, the effective per pound price of the cattle is implicitly adjusted for pencil shrink since the buyer pays for fewer pounds at delivery. The effective video auction price after adjusting for pencil shrink is as follows:

$$(1) \quad AVP_{it} = VP_{it} (1\text{-}PS) - CM,$$

where AVP_{it} is the adjusted video price in dollars per hundredweight for the ith lot at time t, VP is the video price, PS is the percentage of pencil shrink offered for the lot in decimal form, and CM is estimated commissions per hundredweight.

One must also account for estimated shipment costs incurred by the seller[2] if cattle were shipped to a regional auction. Obvious shipment

costs to the regional auctions include trucking fees and shrink, which were estimated accordingly to current trucking costs and estimated shrink losses in loading and transit. Other shipment costs, such as death loss and weight loss due to disease, are more difficult to ascertain and were not considered.

The Greeley, Colorado, and the Oklahoma City, Oklahoma (OKC), regional auction markets were selected for this analysis based on volume, proximity to high-density feeder cattle populations, and the availability of reliable price data. The highest volume sales days for the OKC and Greeley auctions were Monday and Tuesday, respectively (Oklahoma National Stockyards Company, Greeley Producers Livestock Auction).

Table 2 reports the average number of buyers participating in each of the three auctions (SLA, OKC, and Greeley) and the estimated commissions. More sellers usually participated in each SLA auction, which is indicative of the larger area served by SLA. Other studies have found that prices are higher with a blind bidding procedure (Hamm et al.). These factors may increase competitive bidding in a video cattle auction.

Since cattle are not usually shipped from outside the relevant market areas to regional auctions, we assumed that shipment costs removed incentives to truck cattle long distance to either Greeley or OKC and we compared prices only of cattle sold on the video auction that were within the assumed market areas of the regional auctions[3]. The outer market area for the regional auctions was determined by transit time which an industry expert established as eight hours (Reed).

Potential trucking costs to the regional auctions for each lot were estimated based on mileage and truckloads of 44,000 lbs. Break-even trucking costs during 1987 were approximately $1 per loaded mile for a

large western livestock trucking firm (Miller). Thus, a lot 200 miles from one of the regional auctions may have had potential trucking costs of $0.45/ cwt. ($.00227 x 200 miles).

Potential shrink costs were based on data from Michigan State University and the University of Wyoming as reported by Minish and Fox.[4] Estimated percentage shrink is calculated as follows:

(2) Shrink % = .03 + .0061 (MILES),

where Shrink % is the estimated shrink percentage incurred in loading, unloading, and transit; and MILES is the distance in miles to the regional auction. Equation (2) represents full potential weight loss incurred in shipment. Half of shrink is excretory and can be regained quickly if cattle are allowed to eat and drink before sale. Shrink due to tissue loss can take 13-16 days to regain, depending on body weight (Minish and Fox). Because there was no precise way to estimate the time that would elapse between arrival at the regional auction and eventual sale, average shrink loss was estimated to be 75% of total estimated shrink. Multiplying equation (2) by 75% it becomes

(3) Shrink % = 0.0225 + .00458 (MILES).

The potential shrink loss in equation (3) was multiplied by the regional auction price for the appropriate weight category (e.g., 600-700 lb. category) and trucking costs were subtracted. This yielded the following adjusted regional market price:

(4) $ARP_t = [RP_t * (1 - Shrink\%)] - .00227 MILES - CM,$

where ARP_t is the adjusted regional market price per hundredweight at time t and RP_t is USDA's reported midpoint price for the regional auction per

hundredweight obtained from the regional auction locations. Equation (4) reduces to

$$(5) \quad ARP_t = .9775RP_t - MILES\ (.00227 + .00458\ RP_t) - CM$$

Cattle sold in regional auctions are usually delivered immediately while delivery dates for cattle sold in video auctions during 1987 ranged from only a few days following each auction to as much as nine months in the future. The nearby cash basis for the regional markets and the video delivery basis for the video auction were as used to correct for different delivery dates.

The delivery basis (video price minus the feeder cattle futures contract price on or immediately after delivery date) was assumed to contain a substantial portion of current available market information about feeder cattle deliveries in the future. That is, the current basis for future delivery reflects expected supply and demand conditions and seasonal price variations. Adjusting prices for this information by using the basis yielded an adjusted price that could be compared against the current cash market basis. For example, a lot of steers may have sold for $85/cwt. through SLA on Saturday for delivery three months in the future while the OKC price was $84/cwt. on the succeeding Monday. If the nearby cash basis for OKC was -$2.00/cwt. (nearby futures price of $86) and the delivery basis was also -$2.00 (delivery futures price was $87) the video auction price was equal to the OKC price after adjustment for delivery dates. Feeder cattle futures prices were used because they are the only daily contract price for feeder cattle that is publicly available. Also, futures market prices serve as a standard of price comparison in the feeder cattle industry (Just and Rausser), due in large part to the fact that the market information is easily obtained (Ollerman et al.).

These type of basis comparisons are important since buyers and sellers receiving price quotes from both regional and video auctions may be unsure of the relationships between the prices at the two markets since one is for future delivery. By adjusting prices using the basis, an estimate of the actual average price difference, if one exists, can be calculated.

Both bases (cash nearby and video delivery) were calculated for steers sold through the video auction weighing between 600-800 lbs. These weights coincided with the futures contract weight specifications and maintained consistency for future price expectations as measured by the feeder cattle futures contracts.

The nearby cash basis was defined as follows:

(6) $RB_{ik,t+j} = ARP_{ik,\ t+j} - NBF_{t+j}$

where $RB_{ik,\ t+j}$ is the nearby regional auction basis for the ith lot of steers and the kth regional auction price (k = OKC, Greeley), j days succeeding the video auction (j= 2 for most OKC sales and j= 3 for most Greeley sales), ARP is the midpoint of the reported range of prices for a specified weight increment (i.e., 600-700 lbs. or 700-800 lbs.) adjusted for location (equation 5) and NBF is the closing quote for the same day for the feeder cattle futures contract closest to maturity. The cash nearby bases were calculated for steers within the 600-700 lb. and 700-800 lb. weight categories for the weeks immediately following SLA's 14 video auctions during 1987.

The video delivery basis for video sales held on Saturday was calculated as

(7) $VB_{it} = AVP_{it} - ((FP_{mt-1} + FP_{mt+2})/2)$

where VB_{it} was the video auction basis for the ith lot of steers for the video auction sale held on day t. AVP_{it} was the adjusted video sale price

(equation 1) and FP_{mt-1} and FP_{mt+2} were the closing quotes for the preceeding Friday and following Monday feeder cattle futures contract for the contract closest to but not preceeding the video delivery date (contract m), respectively. The average video auction basis for Friday and Monday was used because all but one of the video auctions were held on a Saturday when no futures contract quote was available. One video auction was held on Wednesday and the Wednesday closing quotes were used in the basis calculation in that instance.

Because the three auctions were held on different days of the week, any within-week price trends were corrected by regressing the respective bases (equation (6) and (7)) against a linear trend terms or

(8) $RB_{ik,t+j} = TREND_{k,\ t+j} + e_{k,t+j}$ and

(9) $VB_{it} = TREND_t + u_t$

where TREND is the numerical day of the year and e and u are the respective error terms and are the detrended bases.

A paired t-test (Chou, pg. 334) tested for significant differences between the average detrended bases for video auction prices and regional auction market prices. In addition, a sensitivity test was conducted to compare the average bases for the video auction and the regional auctions using the high market quotes for the regional auctions for the week immediately following the video auction.

Regression Analysis

Even if video auction and regional auction prices are similar it is important to study the factors affecting pricing in video markets. For example, information on premiums and discounts for different lot characteristics will help producers make decisions that will increase the value of the cattle they sell on video auctions in the future.

Video auctions are unique because most of the terms specified by the seller are available to the researcher for analysis. This allows examination of the impact of the terms specified by the seller including pencil shrink, slide[5], days to delivery and timing on price. In addition, other characteristics not normally known in traditional auctions are available for analysis. For instance, the birth and current regional locations of the cattle are known. Also, it was possible to obtain the location to which cattle sold on the video auction were shipped. This allowed an examination of the influence of transporation costs on video auction prices for the group as a whole and also for subgroups by sex and weight.

Individual commodity characteristics are an important component of pricing (Ladd and Martin). Cattle prices vary substantially depending upon many individual lot characteristics. Hedonic pricing models have been used to estimate the value of specific characteristics of lots of cattle (Buccola, 1980; Schroeder et al.; Schulz and Marsh; and Ernst et al.). Schroeder et al. specified a model where cattle auction price was a function of lot characteristics and market information (future prices)

(10) $\text{Price}_{it} = \Sigma V_{ikt} \; C_{ikt} + \Sigma R_{ht} \, M_{ht}$,

where i is the lot number of the cattle in time period t, k are animal traits, h is a particular market influence, V is the value of the specific trait, R is the price effect of the market influence, C is the physcial characteristics of the cattle, and M is the fundamental market forces. Schroeder et al. estimated models separately by weight and sex and included several other variables including animal health, condition, breed, shrink, muscling, frame, size, breed, time of sale, and futures price.

The video auction data analyzed in this study include most of the lot characteristics found in Schroeder et al. Other than visual appraisal of the cattle by the buyer and determination of transportation costs, most relevant information regarding lot characteristics is available in the sales catalogues including number of head in the lot, sex, location, breed, origin (birth location), frame size, flesh, average weight, weight variance within the lot, type of feed currently fed, delivery date, weighing conditions and slide.

Futures markets are an important element in price discovery for feeder cattle and other agricultural commodities (Ollerman et al. Martin and Garcia; Just and Rausser; Dole and St. Clair). Consequently, futures prices are an important tool in pricing feeder cattle on video markets, since all video sales are for future delivery. Other information besides futures prices that is important in determining expected profitability includes feeding costs (Buccola, 1980). We specify a proxy for feeding costs as the per bushel price of No. 2 yellow corn.

Merchandising strategy also plays an important role in pricing cattle lots through video auctions. Merchandising strategies are the terms offered by the seller to make the cattle more desirable for buyers. For example, lots of cattle can be mixed by sexes or weights. However, this practice could lead to discounting of the lot, as additional costs are incurred if further sorting is necessary after purchase. Since the buyer pays transportation costs it is likely that lots of less than a full truck load (approximately 40,000 lbs.) are also discounted. This may make video auctions less attractive for small sellers unless some pooling among small producers occurs.

Another merchandising strategy concerns estimated average weight of the lot of cattle. While pricing cattle in video markets is very similar to regular auction markets, buyers cannot be guaranteed an average weight of delivered cattle, because the average weight listed for each lot is the seller's estimate. This is an important consideration, since some cattle offered for sale may not be delivered for several months.

Video auctions attempt to deal with the problem of accurately estimating weight by specifying an acceptable limit by which actual average delivered weight can exceed estimated weight. A slide is for average weights above this specified limit. Sellers decide which weight limit and slide they will offer to buyers. For example, a seller might sell calves with an estimated average weight of 450 lbs. with a slide of $ .10/cwt. for each pound that actual average weight exceeds 470 lbs. If the actual average weight of the calves were 465 lbs. there would be no discount from the bid price. If the calves averaged 480 lbs. a $1.00/cwt. (10 lbs x $0.10) discount is incurred by the seller.

The weight limit or acceptable variance and the slide combine to provide some protection for the buyer. Both must be considered together, since one could offer a large slide with a large acceptable variance or a small slide with a large acceptable variance. A relative measure of the total protection offered by the weight variance and slide specified as the weight risk (WRISK), is included in our regression analysis, and is calculated as the quotient of the specified acceptable weight variance and the slide. If ones assumes a seller who is certain of delivered average weight for the cattle will offer smaller weight variances and larger slides than a seller who is uncertain, then WRISK is a method of communicating to the buyer the precision with which the weight estimate is made. In the

example above, WRISK would be (470-450)/10 = 2. The expected sign for this variable is negative since increasing the acceptable weight variance relative to the slide should decrease the bid.

Buccola (1982) found that comparable cattle offered at different points in times during the same auction can be priced differently. Timing may be even more critical in a video auction, as large numbers of cattle are offered within a short period. A trend variable was included in our analysis to test for significant price trends during each of the 14 video auctions held by SLA during 1987.

These factors (mixed lots, even truckloads, and allowable weight variances) must be considered in merchandising each lot of cattle. Therefore, the model employed in this study is

$$(11)\quad VP_i = a + \sum_{n=1}^{N} b_n LC_n + \sum_{p=1}^{P} C_p MC_p + \sum_{q=1}^{Q} d_q MS_q,$$

where VP_i is the video auction price for lot i; "a" is an intercept; LC_n is the nth lot characteristic; MC_p is the pth market condition (source of information); MS_q is the qth merchandising strategy; and b, c, and d, are parameter estimates.

Table 3 presents the lot, market, and merchandising characteristics analyzed in this study. Frame, flesh, and breed were taken from the video auction catalogue. Location was included to determine whether cattle from different regions are priced differently, due to transportation costs and the reputation of cattle from different regions.

Log transformations were performed on all prices and characteristics except sex, flesh, frame, location, timing, breed, and truck load

characteristics, which were binary variables. Log transformation provided a relative (percentage) rather than an absolute measure of the impact of characteristics on price. Ordinary least squares (OLS) was used to estimate the parameters of equation (11). The following section reports the basis differences between the video cattle auction and two regional auctions. The parameter estimates for equation (11) are also reported.

Results

Test for Price Differences

Table 4 shows the average differences between the bases of the video auction and the Greeley and Oklahoma City regional auctions. The video auction price significantly exceeded the midpoint of the reported price range for both the OKC and Greeley auctions. This difference was \$0.34/cwt (-\$.50 - (-\$.84)), on the average, for the OKC auction and \$1.38/cwt for the Greeley market (Table 4). For a 700 lb steer these average differences for the video auction would amount to \$2.38/head and \$9.66/head above the respective markets.

The sensitivity test, in which the high points of the regional auction price ranges were used to calculate the regional market bases, revealed no significant difference between the video market prices and the reported high price for the OKC regional auction. However, the video auction prices exceeded the reported high price in the Greeley auction by an average of \$0.75/cwt (Table 4). Therefore, video auction prices after adjustments for location, delivery dates, and within week price trends were at least as high as prices in the OKC regional auction and exceeded prices in the Greeley regional auction.

There are several reasons that may explain why video auction prices were equal to or exceeded the reported high prices in the other markets.

For example, transaction costs may be lower in video auctions, e.g., buyers incur reduced search costs, cattle are handled less and experience fewer disease problems, and more information about vacinations is available. In addition, sellers that reject bids forfeit only the taping fee which may mean an increase in reservation selling price is occurring.

Producers probably sell their best cattle through the video auction and do not include physically defective animals. Physical defects significantly reduced price in regular auctions (Schroeder et al.). Serious physical defects were seldom mentioned in SLA's sales catalogue during 1987, which indicates that these cattle were probably cut from the lot before taping.

According to the sensitivity analysis, the highest prices at the OKC auction were equal to the video auction price while the video auction price exceeded high prices at the Greeley market. This suggests that higher prices at video auctions are not solely due to quality differentials that may exist among the markets.

Lastly, video cattle auctions may be more competitive than regional auctions. The relatively large number of cattle sold by periodic video auctions and the multi-regional sampling of cattle attract more buyers from a wider geographic area (Table 2). The blind bidding process used in the video auction also probably increased prices (Hamm et al.).

Cattle within the Greeley market area that were sold by video auction were less dispersed than the video cattle in the Oklahoma City market area. On the average, cattle in the Greeley market were 231 miles from Greeley while cattle in the Oklahoma City market were 293 miles from Oklahoma City. Therefore, potential shipment costs were lower in the Greeley market area, which indicates that prices in the video auction were higher.

Results of this analysis show that the video auction basis (and consequently the video auction price) is higher than the OKC and Greeley midpoint prices and higher than the Greeley high market price. Sellers in the Oklahoma city market area received bids that are approximately equal to the high OKC price quote for the week following the video auction. Sellers in the Greeley market area received a price on the video auction somewhat higher than the high Greeley market price. These results suggest that informational and structural differences between video and regional auctions were the source of different prices at the separate locations.

Price Model Results

The OLS estimates for equation (11) were calculated for all lots and then by sex and weight. The estimates reported in Table 5 include light feeder steers and heifers (under 600 lbs.) and heavy feeder steers and heifers (over 600 lbs.).

The number of cattle (Number) in each video lot significantly influenced prices in the five cases that were analyzed, which indicates the economies of buying cattle in large lots.

The estimated average weight (Weight) and the sex (Sex) are both statistically significant and have the expected sign. Weight variations appear to affect the price of steers more than the price of heifers and the price of light feeders more than the price of heavier feeders. The larger discounts (premiums) for steers than for heifers as weights increase (decrease) reflect the fact that the demand for heifers is more elastic due to their value both in feeding and as herd replacements.

The number of miles (Miles) cattle are shipped negatively influenced price, but did not significantly influence the prices for light feeders.

Lighter calves were shipped farther than heavier calves, so factors other than transportation contributed to this phenomenon.

Schroeder et al. found significant differences in the prices of different breeds, but breed had little impact on price in our analysis. However, Angus heifers brought higher prices than Herefords, indicating a preference for Angus heifers as replacement breeding stock. The lack of price differentials among breeds in our study may mean that sales catalogue descriptions are not adequate and that buyers may rely more on visual appraisal of the lot.

Native heavier feeder steers (Origin) brought higher prices than resold steers. Heavier native steers, however, are usually sold directly to feedlots and may be perceived to have fewer potential health problems than cattle that have changed ownership several times. Buyers might also believe that "home grown" cattle experience less stress and perform better when they are placed on feed (Sands).

The weight risk (WRISK) faced by buyers is a significant negative influence on price (Table 5). A 1% increase in the WRISK ratio is estimated to cause a .014% decrease in price. Buyers will bid higher if a relatively small allowable weight variance is combined with a relatively large slide. An important merchandising strategy in a video auction is to either weigh cattle prior to consignment or to design a slide consistent with actual market discounts.

The location of cattle influenced price. Only cattle from the upper Midwest (the Dakotas) brought higher prices than the cattle from the Midwest (Colorado, Kansas and Nebraska). This is due perhaps to the stress cattle experience during shipment from outlying areas. Heavily stressed cattle may take several days to recover after shipment (Minish and Fox).

Regional price differences could reflect real or perceived quality differentials among regions. For example, cattle from the mountain states may be smaller, have more Hereford progeny, and have more coarse hair than other cattle during the winter. Cattle from Florida are perceived as being less able to withstand cold weather.

Frame and flesh conditions of animals also affect price. Large-framed cattle with medium to light flesh command higher prices because they are more efficient in feeding than others.

The coefficient for lots of at least one truckload (Truck) was positive but not significant. Even though prices for short loads were not significantly lower than prices for full loads, short loads had a higher proportion of no-sales (24% for short loads and 19% for the entire sample). Perhaps because sellers refused to accept lower prices and relied on local markets. Lots that were not mixed by sex received slight premiums over mixed lots, probably due to costs associated with sorting.

As expected, the feeder cattle futures price for the contract nearest to but not preceeding the video delivery date (Futures) had a large positive effect on video auction price. Futures prices are the main source of price information for future delivery. Bids were reduced as feeding costs increased (as measured by corn prices). This was also expected, since prices are a function of expected profitability (Buccola, 1980).

The offered pencil shrink was a significant determinant of price in all cases, but the sign (negative) on SHRINK was not expected. A regression analysis of the relationship between prices and shrink during 1987 shows that, as the price level increased during the year, sellers tended to offer smaller pencil shrinks. Therefore, a large pencil shrink may be a defensive merchandising strategy in a market in which supplies are

adequate and prices are relatively low. However, as prices increase sellers reduce pencil shrink accordingly.

The number of days to delivery (Days) had a significant positive impact on the price of light feeders. The calves with longer periods to delivery are probably sold while still on the range, which may have influenced buyers because these calves are handled less and are of native origin. Also, when prices for feeder cattle are increasing, as in 1987, buyers may be willing to bid more for calves with later delivery dates.

Timing of sale within a video auction (Timing) significantly influenced the price of most lots. Lots sold later in the auction brought slightly higher prices. However, the later heavier steers (600-800 lbs.) were sold in the auction, the lower the price. This may have been because fewer buyers bid on the larger steers and tended to reduce bids as orders were filled or as buyer demand was satiated (Buccola, 1982).

The tendency of prices to increase during the auction is difficult to explain. Perhaps lighter animals tended to be purchased by buyers who were less aggressive at the beginning of the auction, i.e., buyers of fewer cattle may use the video auction as a means to discover price and are unwilling to bid aggressively before market price is firmly established. A larger number of these buyers may also increase the competition for later lots as the auction draws near a close.

Generally, pricing procedures in video auctions closely follow those in regular auctions. The results were similar to those studies of the demand structure for cattle in a traditional auctions and most of signs and magnitudes of the coefficients coincide with theory. Prices were, in general, acceptable, based on the relatively large percentage of completed transactions.

Premiums and discounts for animals with similar characteristics were similar in both types of auctions. Merchandising strategies are more important in communicating information in a video auction. For example, 1987 sellers would have received premiums for cattle lots sold in at least truckload lots of one sex with an extended period to delivery.

Larger lots of uniform cattle also received premiums in 1987, an indication of the importance of pooling and sorting of small lots of cattle. Accurate weight estimates (WRISK) are essential in obtaining higher prices since the buyers want to avoid risks associated with incorrect weights.

Futures prices are the best publicly available information on which to predict delivery dates. If distant futures prices exceed nearby futures prices, a seller that can offer an extended delivery date may increase the bid price for his or her cattle.

Since merchandising strategies and market information are important in video as well as other auctions, an educational program could help market participants understand the differences and similarities between traditional and video auctions. Buyers and sellers should understand that market quotations in the separate markets are based on different delivery dates, transaction costs, and informational and structural relationships among the various markets. However, these differences can be accounted for in order to compare prices in the different markets.

Summary and Conclusions

Video auctions of cattle have significantly increased in volume in recent years. Buyer and seller acceptance of video auctions is growing, although there may be some concerns about video auctions.

Some potential participants are concerned about the ability of video auctions to provide adequate information (both visual and descriptive) and integrity (contract compliance) to facilitate efficient trade. One way of testing for relative adequacy of information within a market is to compare market prices and bidding processes between markets. This study examined price differences between video cattle auctions and large regional feeder cattle auctions and examined factors that affected pricing in video cattle auctions including lot characteristics, market information and merchandising strategies.

Video auction prices were at least equal to the high reported prices at large regional markets and exceeded average reported price for the week following each video sale. The prices offered for cattle in video auctions price were similar to prices in other auctions. However, merchandising strategies, especially those relating to the accuracy of weight, are more important in video auctions.

Video auctions offer some unique features that should generate interest from industry, government, and the research community. Satellite video auctions (as analyzed here) are national markets. Large numbers of cattle from numerous regional locations with various weight and other characteristics are offered for sale. Consequently, these auctions could be a valuable source of market information.

There are concerns about the impact of video cattle auctions on other markets, particularly on regional and local auctions in particular. Research should examine any changes in market share between markets and the flow of information between different market outlets. Another research topic could be potential problems with contract compliance after a video sale or with buyer and seller satisfaction.

Further research should examine the relative pricing efficiency of video cattle auctions and regional markets. Video cattle auctions also offer an alternative forward pricing method for buyers and sellers. The relationship between video auction prices and futures prices also warrants further study.

Footnotes

1 Weighing conditions are the agreements between buyer and seller concerning where and how cattle will be weighed at delivery.

2 Prices received by sellers are examined because of a more urgent need for information to that group. Buyers, especially large ones, are assumed to understand the relative prices between the pricing alternatives more thoroughly than the general population of sellers.

3 A comparison of prices for lots outside of the market areas yielded basically the same results that are reported in this paper. However, the variability in prices was greater. The number of 600-800 lb. steer lots sold through SLA outside of the market areas was 109 and 258 for Greeley and OKC, respectively.

4 Shrink incurred in shipment is separate from pencil shrink. Adjustments to the video auction prices for pencil shrink were established by the seller and were designed to at least partially compensate buyers for shrink in shipment. The shrink costs mentioned here are estimates of actual shrunk losses that would have been incurred had the cattle been shipped to the regional auction.

5 Slide is a discount in cents per hundredweight should the average weight of a load of cattle exceed an allowed limit.

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Table 1. Selected Characteristics of SLA Video Cattle Auctions, 1987.

Characteristic	Total
Total Number of Lots	2,222
Total Number of Cattle offered for sale	335,654
Total Number of Cattle sold	271,079
Total Number of Light Steers offered for sale (under 600 lbs.)	68,070
Total Number of Light Feeder Steers sold	57,851
Total Number of Heavy Feeder Steers offered for sale (600 - 800 lbs.)	91,624
Total Number of Heavy Steers sold	75,855
Average Lot Size (Head)	150
Average Estimated Weight Per Head (lbs.)	613
Average Days to Delivery	39
Average Miles Shipped After Sale (Miles)	471

LOT # 1410 **ARLO EASTMAN**
75 STEERS **BASE WT: 700#**
LOCATION: Woodruff, Ut--393 miles W of Cheyenne, Wy.
DESCRIPTION: Herefords. BWF. Blacks and a few BeefMaster cross.
ORIGIN: Native
FRAME: Medium **FLESH:** Medium to Light
EST.WT.VAR: Uneven **HORNS:** None
FEED: Pasture with no supplement of any kind.
DELIVERY DATE: Oct. 1-10, 1987. Seller's option.
WEIGHING COND: Cattle will be gathered into dry lot by 8:00 a.m., hauled 15 miles. Unloaded and weighed in Ross Jackson scales in Randolph, Ut. on the ground with a 2% pencil shrink.
SLIDE: .03¢ over 725 lbs.
COMMENTS: Steers have not been implanted. A nice set of light yearling steers.
REPRESENTED BY: Jerry Goodwin

PRICE_____**BUYER**_____

Figure 1. Sample of SLA catalogue entry

Table 2. Average Number of Buyers and Estimated Commissions for Regional and SLA Auctions, 1987.

	Day of the Week Most Sales Held	Average Number of Buyers Viewing Auction	Major Buyers Attending[a]	Sales Commissions and Other Deductions For Yearling Steers
SLA[b]	Saturday	225[c]	30	2% of Gross Sales + 1.50/head[d]
OKC[e]	Monday	30	15	$7.34/head
Greeley[f]	Tuesday	50	15	2% of Gross Sales + 1.50/head[d]

[a]Buyers who frequently buy relatively large numbers of cattle.
[b]Estimates provided by SLA.
[c]Average number of registered buyers with SLA. Of this number 60-80 will actually buy cattle at an average sale. During 1988, 1,507 sellers consigned cattle to SLA and 372 different buyers purchased cattle.
[d]The $1.50 per head is estimated cost of beef board deduction and inspection.
[e]Estimates provided by Oklahoma National Stockyard Company for yearling steers.
[f]Estimates provided by Greeley Producer Livetock Auction.

Table 3. Independent Variables for the Video Auction used to Estimate Equation (11).

Binary Physical Characteristic Variables		Binary Location Characteristic Variables	Market Characteristic Variables	Lot Characteristic Variables	Merchandising Variables
		Current			
Frame:	Large[a]	Location: Mountain States	Steer/Corn Ratio[b] (SCR)	Number of Head (Number)	WRISK
	Medium/Large	(Nevada, Utah, Idaho,	Future Price (FP)	Average Per Head Estimated	Truckload (Truck)[d]
	Medium	Wyoming and Montana)		Weight (Weight)	Mixed Lots[e]
	Small*				
		Southwest (Texas, Oklahoma,			Pencil Shrink (Shrink)
		and New Mexico)		Miles Shipped (MILES)[c]	Days to Delivery (Days)
					Time During Sale (Timing)
Flesh:	Heavy				
	Medium Heavy				
	Medium	Florida			
	Light Medium	California			
	Light*	Arizona			
		Upper Midwest			
		(North and South Dakota)			
Breed:	Hereford*				
	Angus	Midwest*			
		(Colorado, Kansas			
		and Nebraska)			
	Exotic Cross				
	English Cross	Other			
	Exotic/Engl.Cross	Origin: Native(home-raised)			
		Other			
Sex:	Male*				
	Female				

* Specifies the control category for each binary characteristic, i.e., no dummy variable is included in the regression analysis for the category

[a] Categories for each characteristic are listed after the colon following the characteristic

[b] The steer/corn ratio serves as a proxy for relative profitability of the cattle feeding industry

[c] Miles shipped from delivery point (ranch, feedlot, etc.) to destination designated by the buyer.

[d] Binary variable where lots over 40,000 lbs. = 1 otherwise = 0

[e] A Binary variable where lots sold with only one sex = 1 otherwise = 0

Table 4. Basis Differences Between Regional Auctions and Video Auction, 600-800 lb. Steers, 1987[a].

Market/Variable	Number of Observations	Using Midpoint of Regional Auction Price Range	Using High Point of Regional Auction Price Range
			$/cwt
OKC:			
(a) Video Basis	192	-1.79 (2.14)	N/A[b]
(b) OKC Basis	192	-2.49 (2.04)	-0.02 (2.56)
(c) Detrended Video Basis[c]	192	-0.50 (2.13)	N/A
(d) Detrended OKC Basis	192	-0.84 (2.45)	-0.32 (2.51)
(e) Paired t-tests ((c) - (d))		1.95*[d]	-0.94
Greeley:			
(f) Video Basis	87	-1.31 (2.58)	N/A
(g) Greeley Basis	87	-4.30 (2.40)	-2.04 (2.74)
(h) Detrended Video Basis	87	0.09 (2.42)	N/A
(i) Detrended Greeley Basis	87	-1.29 (2.90)	-0.66 (2.87)
(j) Paired t-tests ((h) - (i))		5.40**	3.20**

[a] Standard Deviations are in parentheses.
[b] Not Applicable.
[c] See equations (8) and (9).
[d] t-value.
* Denotes significantly different than zero at the 10% level.
** Denotes significantly different than zero at the 5% level.

Table 5. OLS Parameter Estimates for Video Auction Price Model.[a]

Independent Variables	Overall	Light Steers	Light Heifers	Heavy Steers	Heavy Heifers
	ARS[b]: .93 N = 1528	ARS: .88 N = 423	ARS: .87 N = 357	ARS: .77 N = 477	ARS: .86 N = 298
Intercept	2.540 (26.496)**	3.378 (14.425)	2.327 (7.865)**	2.778 (18.171)**	1.738 (10.442)**
Lot Characteristics:					
Number	0.010 (5.338)**	0.013 (2.950)**	0.017 (3.594)**	0.006 (2.031)**	0.007 (2.615)**
Weight	-0.374 (-48.053)**	-0.478 (-27.940)**	-0.356 (-15.679)**	-0.286 (-14.889)**	-0.169 (-7.636)**
Sex	0.093 (34.668)**	N/A[c]	N/A	N/A	N/A
Miles	-0.005 (-3.817)**	0.008 (0.303)	0.002 (-0.601)	-0.011 (-6.071)**	-0.006 (-3.723)**
Breed:					
English-Exotic Cross	0.009 (0.998)	0.026 (1.644)	0.032 (1.161)	0.003 (0.185)	0.011 (0.948)
English Cross	0.006 (0.674)	0.022 (1.352)	0.025 (0.874)	0.008 (0.537)	0.014 (1.136)
Exotic Cross	-0.002 (-0.212)	0.020 (1.154)	0.035 (1.193)	-0.018 (-1.218)	0.008 (0.614)
Angus	0.034 (1.852)*	0.023 (0.503)	0.058 (1.302)	0.019 (0.664)	0.138 (4.758)**
Origin	0.005 (1.669)*	0.003 (0.696)	0.002 (0.259)	0.008 (1.688)*	-0.000 (-0.083)
Flesh:					
Heavy	-0.019 (1.069)	0.018 (0.627)	N/A	-0.051 (-2.110)**	-0.053 (-1.542)
Medium-Heavy	0.014 (1.845)*	0.001 (0.054)	0.000 (2.240)**	-0.055 (-4.166)**	-0.020 (-0.982)
Medium	0.012 (1.741)*	0.003 (0.276)	0.045 (2.573)**	-0.056 (-4.439)**	-0.012 (-0.603)

Light-Medium	-0.003 (-0.341)	-0.012 (-1.008)	0.029 (1.953)*	-0.076 (-5.398)**	-0.017 (-0.826)
Frame:					
Large	0.041 (4.595)**	0.050 (2.472)**	0.040 (2.170)**	0.027 (1.810)*	0.006 (0.456)
Medium-Large	0.035 (4.553)**	0.030 (1.656)	0.029 (1.959)*	0.030 (2.118)**	0.008 (0.831)
Medium	0.031 (4.139)**	0.026 (1.409)	0.035 (2.480)**	0.028 (1.996)**	0.007 (0.693)
Location:					
Mountain	-0.012 (-3.515)**	-0.021 (-3.595)**	-0.006 (-0.986)	-0.011 (-1.684)*	-0.019 (-3.054)**
Southwest	-0.020 (-6.513)**	-0.041 (-5.498)**	-0.043 (-5.249)**	0.003 (0.719)	-0.013 (-3.049)**
California	-0.031 (-2.847)**	N/A	N/A	-0.006 (-0.509)	-0.017 (-0.844)
Arizona	-0.024 (-1.833)**	-0.016 (-0.744)	-0.005 (-0.170)	-0.053 (-2.458)**	-0.019 (0.671)
Florida	-0.078 (-10.876)**	-0.115 (-8.961)**	-0.104 (-6.426)**	-0.023 (-1.333)	-0.054 (-3.296)**
Upper Midwest	0.018 (2.294)*	-0.003 (-0.207)	0.005 (-0.363)	0.040 (2.084)**	0.017 (0.891)
Market Conditions:					
Futures	0.949 (52.874)**	0.921 (21.456)**	0.947 (18.013)**	0.826 (28.361)**	0.856 (30.621)**
Corn	-0.038 (-1.963)**	-0.143 (-2.818)**	-0.039 (-0.641)	-0.031 (-1.188)	-0.029 (-4.817)**
Merchandising Strategies:					
WRISK	-0.013 (-5.425)**	-0.006 (-1.572)	-0.010 (-2.539)**	-0.036 (-4.796)**	-0.026 (-2.554)**
Truck	-0.013 (-3.591)**	-0.007 (-1.148)	-0.012 (1.807)*	0.001 (0.071)	-0.025 (-1.480)
Mixed	0.010 (2.498)**	0.027 (1.738)*	-0.011 (-1.390)	N/A	-0.018 (-1.010)

Shrink	-0.029 (-8.090)**	-0.022 (-3.324)**	-0.022 (-2.812)**	-0.024 (-3.793)**	-0.029 (-4.817)**
Days	0.007 (5.082)**	0.008 (2.550)**	0.012 (3.006)**	0.002 (0.873)	0.002 (0.936)
Timing	0.000 (6.387)**	0.000 (1.435)	0.000 (2.240)**	-0.000 (-1.734)*	0.000 (1.121)

*Denotes statistical significance at 10% level.
**Denotes statistical significance at 5% level.
[a]t-values are in parentheses.
[b]adjusted R-square.
[c]not applicable.