DESCRIPTIVE ANALYSIS OF THE OKLAHOMA LIVESTOCK AUCTION MARKET INDUSTRY

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Bachelor of Science in Agriculture

Oklahoma State University

Stillwater, Oklahoma

1982

Submitted to the Faculty of the Graduate College
of the Oklahoma State University
in partial fulfillment of the requirements
for the degree of
MASTER OF SCIENCE
December, 1984

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PREFACE

This study presents a descriptive analysis of the local livestock auction market industry in Oklahoma. The primary objectives were to identify critical problem areas faced by the industry; to determine the effectiveness, success, and future of special livestock sales; to examine managerial attitudes toward electronic livestock marketing; to explore the influences of livestock marketing organizations; to measure the effect of changing livestock volume on auction market costs; and to estimate auction market profitability. Individual auction markets can compare their costs and characteristics to the average to determine the relative strengths and weaknesses of their individual operations.

I would like to express special appreciation to my graduate committee: Dr. James R. Russell, Dr. Robert L. Oehrtman, and Dr. Clement E. Ward for their guidance, assistance, and patience throughout the planning stages and completion of this study. I am grateful to the Department of Agricultural Economics for providing financial assistance and the opportunity to continue my education. Many thanks are also due to Betty Harris for her typing skills and her ability to withstand the many changes to this manuscript.

My sincerest thanks go to my fellow graduate students and close friends whose continued support and eternal friendship have made the graduate program an enjoyable experience that will provide fond memories far into the future.

Finally, my deepest gratitude and love are extended to my parents and family without whose loving support, everlasting encouragement, and unfailing patience this project would not have been possible.

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CHAPTER I

THE RESEARCH PROBLEM

Introduction

Livestock auction markets represent a class of marketing facility that do not typically take title to livestock, but rather serve to arrange and supervise competitive price bidding among potential buyers. In Oklahoma, livestock are important to the agricultural economy and auction markets are an important part of the livestock sector. During 1983, Oklahoma livestock receipts were 62.7 percent of total agriculture receipts (Oklahoma Agriculture Statistics, 1983). Local livestock auctions sold 2.3 million head of livestock in Oklahoma. Approximately, 1,843,000 cattle, 262,000 calves, 65,000 hogs, 83,500 sheep, and 18,500 horses were sold through Oklahoma auctions in 1983 (survey data, 1983).

Since the 1920's several factors have led to the rapid expansion and growing importance of the local auction as a marketing facility. These factors include: (1) improvement of motorized transportation and modern highways; (2) decentralization of the packing industry; (3) development of standard grading classifications for livestock; and (4) improvement in the collection and dissemination of market information to livestock producers (Polishuk and Buccola, 1978).

Local auctions have become a convenient marketing place for farmers to sell small lots of livestock and to purchase stocker, feeder, and breeding animals. Livestock producers' awareness of current market

prices, and the supply and demand situation has been enhanced by the close proximity of auction markets to their homes (Polishuk and Buccola, 1978). Auction markets also provide a centralized point in which large volumes of livestock can be purchased.

In the early 1960's, the number of Oklahoma auction markets was at its peak. Almost every small town had a local livestock auction market that held weekly or biweekly sales. In the 1960's and the early 1970's, the number of Oklahoma auction markets began to decline. Larger livestock auctions saw an increase in livestock volume due to the development of interstate highway systems, and the transition from many small farms and ranches to larger farms and ranches. The number of livestock auction markets in Oklahoma declined sharply in 1972 following the cattle market crash. Since that time the number of local auctions in Oklahoma has stabilized with approximately one auction market per county with trade areas of one to two counties. The volume of livestock, especially cattle, traded through local auction markets is directly correlated with current livestock trends. In general, as livestock prices increase the volume of livestock sold through local auction markets increases. Currently, approximately 75 percent of all livestock in Oklahoma are sold through a local livestock auction market at one time or another (Newman, 1983).

Oklahoma auction markets conduct both regular weekly sales and special livestock sales. The special livestock sales are held periodically throughout the year and specialize in selling a specific type of livestock such as stocker cattle, feeder cattle, slaughter hogs, feeder lambs, horses, or breeding stock.

Hypothesis

This study will use the working hypothesis that an accurate descriptive analysis of the Oklahoma livestock auction market industry will be helpful to industry participants. This expanded base of knowledge will aid auction operators in lowering costs and increasing profits. This knowledge will also help policy makers and researchers plan for future industry growth and development.

Problem

Over the past five decades, local livestock auction markets have been responsible for dynamic changes in the livestock marketing system, and are today one of the most important market outlets for the nation's livestock. Oklahoma livestock auction markets are a critical link between buyer and seller in the vertical marketing channel; however, very little is known about Oklahoma's local livestock auction markets.

The efficiency of the livestock marketing system depends to some degree upon how efficiently livestock auction markets perform their function. Previous research indicates that livestock auction markets typically incur lower per head costs as the number of livestock sold increases (Spielman et al., 1983). That is, significant economies of size may be achieved by expanding volume. However, too many markets often exist in a given geographic area for any firm to handle enough volume to capture these available economies (Spielman et al., 1983). Little research has been conducted in Oklahoma within the past 25 years to compare the efficiency of small markets to large markets. If economies of size do exist, these economies may not be realized by many small auctions in Oklahoma.

In addition to economies of size, managerial practices and operational methods greatly affect the success of the local livestock auction market. Attitudes concerning critical problem areas, effectiveness of special livestock sales, growth of electronic livestock marketing, and the effectiveness of livestock marketing organizations all remain unanswered. Research that provides the information base needed to answer these questions will help maintain or increase profitability in the livestock auction market sector.

Purpose and Objectives

An increase in conceptual, theoretical, and empirical knowledge about local livestock auction markets in Oklahoma should be useful to industry participants, policy makers, and researchers. The increased knowledge should be beneficial in identifying crucial problem areas, determining effectiveness of special sales, examining attitudes toward electronic livestock marketing, exploring the effectiveness of livestock marketing associations, estimating efficient cost structures, and discovering the effect of volume on profitability. The expanded base of knowledge concerning Oklahoma's livestock auction markets should promote more objective and intelligent decision making regarding the development and future of the auction market industry.

The primary objective of this study is to accurately describe the Oklahoma livestock auction market industry, and to develop inferences for future progress and development of the industry.

Specific objectives of this study are:

1. to identify the most critical problem areas faced by Oklahoma auction markets;

2. to determine the effectiveness, success, and future of special livestock sales;
3. to examine the attitudes of auction market operators toward electronic livestock marketing;
4. to explore the influences of existing livestock marketing associations and the potential for new organizational services;
5. to estimate cost functions for Oklahoma livestock auction markets; and
6. to discover the effect of livestock volume sold on auction market profitability.

Knowledge of economies of size and the industry's operational attitudes can be useful in determining the strengths and weaknesses of the entire auction market industry, as well as the individual auction operator. In addition, this will develop a base of information to help predict industry growth and development.

Organization of the Study

Chapter II contains the literature review and highlights of previous research relating to local livestock auction markets. The literature concerning local livestock auction markets is limited. The chapter contains two sections. The sections discuss operating costs of local auction markets in other states, and electronic marketing as an alternative or supplemental marketing method.

Chapter III describes the procedures followed in this study. The source of data, sampling procedures used to obtain data, and procedures used to determine sources of firm efficiency and profitability are

described. In addition, an animal marketing unit classification is defined so that heterogeneous livestock species may be converted to a common unit of measure.

Chapter IV discusses the costs of operating Oklahoma livestock auction markets, and identifies the relationship between specific costs of operation and market volume. In addition, this chapter summarizes the attitudes of auction market operators toward special livestock sales, critical areas of concern, electronic livestock marketing, and livestock marketing organizations. This summary will compare and contrast attitudes of small, medium and large auction markets.

Analysis of auction market profitability is presented in Chapter V. This chapter summarizes profit per animal unit and the returns needed to cover fixed costs per animal unit by auction market size.

Chapter VI contains the summary and conclusions. Implications of this research project are discussed and recommendations for further research are presented.

Appendix A contains the survey questionnaire used in the mail survey of local auction markets, and Appendix B contains the annual report of marketing agencies used by the United States Department of Agriculture Packers and Stockyards Administration to obtain income statements for this study. Appendix C contains additional descriptive information that may be useful to local auction market operators. Furthermore, Appendix D presents summary information concerning three terminal markets that sell Oklahoma livestock.

CHAPTER II

LITERATURE REVIEW

Introduction

The literature dealing with the structural and managerial characteristics of local livestock auction markets is limited. Little research has been conducted concerning the operation of local livestock auctions, and even less research has dealt with Oklahoma auctions. Most literature deals with developing efficient cost functions for local auction markets, with little about descriptive characteristics and the influence of these characteristics upon managerial decisions. In contrast, the amount of literature on electronic marketing of agricultural commodities as a viable marketing alternative is abundant and continually growing. For these reasons, this literature review consists of two broad categories. The first section deals with general auction market literature, and particularly with operating costs of local auction markets in other states. The second section looks at electronic marketing and its impact upon the future of local livestock auction markets.

The use of electronic marketing as a viable marketing tool does not mean the elimination of local livestock auction markets. Auction markets supplemented by electronic livestock marketing procedures could experience increased numbers of buyers at lower costs; therefore,

increasing pricing and operational efficiency. Evaluation of several electronic marketing systems reveals a number of rather consistent benefits to buyers and sellers: improved market information; increased marketing efficiency; greater pricing accuracy; increased competition through increased number of buyers; higher price levels; and improved market accessibility (Bell et al., 1983*). Existing auction markets can provide assembly facilities, bring an element of credibility where producers are concerned, and are an established entity familiar to producers and buyers (Russell and Purcell, 1980). In addition, auction markets using computerized sales data can minimize errors in the computation of records and accounts, provide accurate permanent records of all business transactions, and reduce clerical labor by handling routine accounting tasks (Johnson et al., 1973). Auction market operators using electronic livestock marketing systems may reap the benefits of both marketing methods.

General Auction Market Analyses

Lindberg and Judge estimated cost functions for the Oklahoma livestock auctions in 1958. The study estimated the relationship between livestock handled and cost efficiency when the degree of capacity utilized was taken into account. In order to put the auctions on a more homogenous basis for the purpose of cost analysis, the volume of livestock handled by each auction market was converted to a market or animal unit base. Each of the following was considered equivalent to one animal unit: one head of cattle over 400 pounds; two calves, 400 pounds or less; two hogs; five sheep; and one horse. The same animal unit base will be used in this study. Lindberg and Judge also conducted

a separate analysis for hired labor concluding that a one animal unit increase in the volume handled brought about a 46-cent increase in hired labor costs. The study included regression models on total variable and total fixed costs with a tabular breakdown of pronounced differences in unit operating costs within volume groups and under different operating conditions. Institutional factors limiting the degree of operational efficiency of auction markets were also identified. Two of the more important institutional factors were: (1) the practice of operating auctions with only one sale day per week, thus leaving the physical plant idle the majority of the time; and (2) the degree of seasonality of livestock marketing during any one year.

Johnson (1972) enumerated alternative methods of selling fed cattle and developed criteria used to evaluate the alternative methods in an often controversial study. Eight selling methods were described and evaluated: terminal; auction (local auctions); direct; country commission; telephone direct; telephone auction; teletype auction; and consignment selling. Evaluation of the eight methods consisted of comparing and ranking each with respect to (1) total marketing costs (physical efficiency), (2) pricing efficiency, (3) bargaining position, and (4) industry applicability. Johnson concluded that the teletype method of selling livestock was far superior to any other selling method used in 1971. Auction market methods were ranked seventh in physical efficiency, sixth in pricing efficiency, and third in bargaining position.

Johnson et al. (1973) studied the effects of computer processing of sales data on a livestock auction market by installing an electronic digital computer in a Missouri livestock auction. The computer system

minimized the possibility of error in the computation of records and accounts, provided accurate permanent records of all business transactions, and reduced clerical labor by handling routine accounting tasks.

Polishuk and Buccola (1978) analyzed statistical and synthetic operating costs at Virginia livestock auction markets. The study reviewed theory of identifying technical economies via statistical and synthetic analysis, presented statistical analysis of cost-volume and cost-size relationships in Virginia livestock auction markets, and developed synthetic estimates of operating costs for these model auction sizes. Four primary factors affecting efficiency at Virginia auction markets were found to be labor, use of equipment, utilities, and miscellaneous expenditures. At all auction sizes, labor accounted for over 40 percent of total synthesized costs and for greater than 50 percent of total reported costs. The authors concluded that although Virginia markets' rates of return above costs averaged approximately 16 percent, they found it unlikely that markets would be motivated to increase operational efficiency either by internal reorganization or expansion.

Kuehn (1979) conducted an analysis of factors affecting prices at West Virginia livestock auctions. The objective of the study was to isolate factors which can be controlled by auction market managers and farmers to influence prices. The data used for this study were collected from sale sheet summaries from special feeder calf sales. Data from 18 separate sales at ten locations during 1978 were used. Recommendations and conclusions included: (1) the optimum number of order buyers at a particular sale was seven, while the average number

was only four; (2) prices increased as lot size increased to 41 head, but thereafter, prices declined; (3) prices increased slightly toward the latter one-third of the sale so that alternating lots by sex and grade could be beneficial; (4) sale sizes of more than 1000 animals negatively influenced price, therefore, conducting smaller sales held more often could be helpful; (5) prices decreased as the Fall selling season progressed and prices increased after the end of October making the extension of the season and/or a schedule of Spring sales beneficial; (6) an improvement in the dissemination of market information could allow farmers to shop around for higher priced sales, if transportation considerations permitted; and (7) although it is usually most beneficial to sell heavier, higher grade animals, farmers should still consider changes in the steer-beef/corn price in making selling decisions.

Buccola and Chieruzzi (1981) compared costs of marketing slaughter cattle by computerized and conventional auction systems in Virginia. Two cost relationships were studied: (1) an analysis of aggregate or total slaughter cattle marketing costs, and (2) an analysis of cash costs incurred during computerized and conventional sales. The first or aggregate analysis included costs of farm-to-market transportation, cattle buyer time and expenses, and the cattle sale process itself. The second or cash cost analysis was concerned with only out-of-pocket expenses of operating computerized and conventional sales. The authors concluded that the total per-head costs associated with marketing cattle by computer are less than those associated with marketing cattle in the conventional auction system, provided a specified volume of cattle is sold by computer.

McLemore et al. (1982) examined the limitations of ordinary least squares (OLS) compared to frontier function methods of estimating long run average cost functions for Tennessee livestock auctions. The authors suggest the frontier function approach is more appealing theoretically, because the frontier function method is analogous to the envelope concept, although measurement error may result in misestimation of long run average total costs (LRATC). The authors' data indicated that a large portion of auction market firms operated at a level of volume which leaves substantial cost economies uncaptured, assuming the OLS function to be the appropriate estimate of LRATC. The authors suggested that frontier function estimates more accurately reflected observed industry behavior and thus, was more appropriate in determining LRATC.

In a comparable study to that of 1982 the same group of researchers, Spielman et al. (1983) studied Tennessee livestock auction markets and used Animal Marketing Units (A.M.U.) as a homogenous measure of livestock volume handled by each market. The standard A.M.U. as defined by the USDA was used: with one cow, one calf, three hogs, four sheep, or one horse equaling one animal unit. Specific average cost-volume relationships were derived for seven size categories of auction markets. They ranged from less than 9,000 A.M.U. to 54,000 or more A.M.U. Spielman et al. (1983) examined the composition of the cost structure to identify inefficient areas of market operation. Each component cost was expressed in average figures by dividing total expenses by volume of livestock handled yielding the cost incurred for each A.M.U. Expenses were classified as either fixed or variable costs. Fixed costs were: total depreciation; taxes (excluding income taxes);

insurance other than unemployment; legal fees; interest; and licenses and premiums. Variable costs included: unemployment insurance; salaries; rent; utilities; travel and auto; advertising; supplies; bad debts; trucking; maintenance; labor; and miscellaneous expenses. To show how costs change as volume changes, Spielman et al. (1983) estimated the long run average total cost (LRATC) curve showing the mathematical and graphical relationship between average total cost and volume of output for the industry firms. Two methods were used to estimate the LRATC curve for the Tennessee livestock auction market industry: ordinary least squares (OLS) and a frontier function method which uses linear programming techniques. In comparing the two methods, Spielman et al. (1983) found that the frontier function indicated that small markets can be relatively cost efficient while the OLS function indicated that much larger volumes are required to achieve the same level of efficiency. The authors concluded that economies of size did exist in the Tennessee livestock auction market industry with markets handling larger volumes experiencing lower costs per head handled. In addition, Spielman et al. (1983) concluded that, despite previous research, the results indicated that most of the available economies of size may be realized by auction markets with relatively small annual volume levels provided the markets use the most efficient size plant for that level of volume.

Electronic Marketing Analyses

Ethridge (1978) documented the development of TELCOT, the first computerized market for a United States agricultural commodity. TELCOT was initiated in 1975 by the Plains Cotton Cooperative Association.

Ethridge identified three necessary conditions for successful implementation of electronic marketing: a standardized grading system acceptable to buyers and sellers, sufficient volume to make the system cost efficient, and a large amount of investment capital. The author concluded that TELCOT had actually expanded availability of market price information and increased buyer competition.

Henderson et al. (1979) reviewed the theoretical implications of electronic markets, actual electronic marketing systems, the empirical evidence regarding pricing and operational efficiency, and industry structure. Expected widespread electronic marketing advantages were: (1) improved pricing efficiency, (2) greater operational efficiency, and (3) a reduced rate of economic concentration and integration. The authors included in their analysis the results of the Egg Clearinghouse, Inc. electronic marketing project, and concluded that the system raised short-run standard deviation of prices and indicated a greater frequency of price changes.

Holder (1979) assessed the benefits of sheep and lamb teleauctions in Virginia and West Virginia finding that teleauctions raised the entire price structure for both states' prime and choice lambs. Holder attributed the increase to more buyers, greater convenience for buyers bidding from their offices, more efficient truckload units of lambs, buyers receiving fresher lambs, and more producer control.

Glazener (1979) conducted a feasibility study of computerized spot markets for feeder cattle in Texas entitled CATTLEX. Sporleder (1980) authored a follow-up analysis to Glazener's CATTLEX study. Sporleder identified two conditions for a successful system: (1) description of cattle must be accurate and acceptable to both buyers and sellers; and

(2) sellers must deliver cattle when sold and buyers must accept delivery. Sporleder believed the potential benefit to the feeder cattle segment to be significant; although, only time would tell how acceptable electronic marketing would be to the feeder cattle trade in Texas.

Russell and Purcell (1980) in their study of slaughter cattle sales in Virginia, state that in theory electronic marketing can reduce or eliminate the spatial imperfections and pricing problems now present in "thin" markets. Local livestock auctions in some instances may be an example of spatially thin markets. Russell and Purcell argue that since electronic marketing allows for easy entry and exit by buyers, the market would be more responsive to short-run changes in supply and demand. Electronic marketing also offers the potential to improve operational efficiency by reducing many marketing costs. Assembly, transactions, and transfer costs can be cut by reducing multiple handling, cross-hauling, and time consumed in many of the current markets. In addition, pricing efficiency should be improved by providing access to more buyers and by encouraging the use of descriptive terms which identify and categorize important value-related product attributes. Russell and Purcell concluded that a strategy for introducing electronic marketing should include: (1) mirror-image surveys completed to identify the areas of compatibility and agreement on which system to use; (2) present auction markets because they can provide assembly facilities, bring an element of credibility where producers are concerned, and are an established entity familiar to producers and buyers; (3) operation by a private non-profit organization; (4) low per unit costs of the system to cover the costs of the system itself; (5) educational programs stressing the problems

associated with thin markets and the ability of the electronic system to provide access to more buyers; and (6) overall efforts to establish a coalition of interests and to involve, during system development, all the groups that will be using the system.

Helmreich's et al. (1980) study of feeder calf teleauctions in Georgia found that teleauction prices were significantly greater than sale barn prices. Sex, weight, load size, and breed were determined to be significant factors in what the authors identified as improved pricing and physical efficiency.

Russell (1981) examined the cost and price considerations associated with computerized slaughter lamb sales and demonstrated the use of the mirror-image survey technique in evaluating electronic marketing systems. Russell (1981) concluded that if properly designed and implemented, electronic marketing appeared to have the theoretical potential to increase technical and pricing efficiency. Russell also concluded that although the future of electronic marketing looked promising, a much broader theoretical and empirical base was needed if intelligent decisions were to be made regarding the future of electronic marketing.

Bell et al. (1983) argued that with electronic marketing buyers and sellers can eliminate costs and other disadvantages of handling and transporting the product. Problems solved by electronic marketing include: (1) excessive handling and transporting throughout the market channel; (2) lack of buyer competition; (3) failure of market price to quickly reflect changing market conditions; (4) incomplete and untimely market information; (5) inability of current marketing methods to reflect quality differences in market value; (6) inability of farmers to

gain access to many buyers; and (7) inability of buyers to gain access to adequate sources of supply.

Russell and Purcell (1983) analyzed and compared the attitudes of buyers and sellers who have used the Electronic Marketing Association's (EMA) Computerized trading system. The study evaluated the unsuccessful Virginia slaughter cattle program and the successful Eastern Lamb Producer Cooperative (ELPC) program. The analysis summarizes the acceptance and resistance of involved groups: order buyers; producers; auction markets; and packers. Conclusions emphasized the need for support in the development and implementation of electronic marketing systems by strong industry acceptance and system credibility.

Russell and Purcell (1983*) evaluated the costs of computerized trading systems with the feasibility of a computerized trading system hinging on the capacity of a system to be cost efficient at all levels of the market continuum. Theoretically, a potential trader would be expected to participate in a new electronic marketing system if the discounted value of increased price, more efficient pricing, and/or other benefits exceeded expected cost increases. However, it is difficult to demonstrate price benefits. Price benefits are linked to value-related dimensions of the product, while costs are typically computed on a per unit basis. Conclusions of the article are: (1) auction charges can be reduced by increasing the number of head offered per lot and per sale; (2) increased bargaining power may lead to reduced grading and auction market fees; (3) remote-access timesharing computer systems can compete with teleauctions; (4) inferences from this study across other commodities, systems, or market participants are not justified unless prior information suggests that sale conditions are

similar; and (5) average lot size, number of head offered per sale, and number of buyers participating were important factors in determining per-head costs of a computerized system.

Ward (1983) evaluated the success of marketing Oklahoma feeder cattle by video auctions. In video auctions, cattle remain on the ranch during the sale. Buyers see a video tape of the cattle for sale, and cattle are then sold to the highest bidder. A few days after the video auction, cattle are moved from the seller's ranch to the buyer's location. Video marketing in Oklahoma has more than doubled over its three-year life. Benefits from video auctions outweighed disadvantages to most sellers and buyers. Seller advantages were: less handling of cattle; greater control over marketing decisions; and more potential buyers. Buyer benefits included: market agent guarantees of seller performance; reduced travel and time needed to see cattle; and convenience of truckload size lots from a single owner. Ward determined that video auctions would not replace terminal or local auction markets, but would continue to be a viable marketing alternative for Oklahoma cattlemen.

As this literature review suggests, the research concerning local livestock auction markets is minimal. Most studies have dealt only with determining costs of operating auction markets and comparing these costs with alternative livestock marketing methods. In contrast, the amount of research on electronic marketing of agricultural commodities is abundant and continually growing.

CHAPTER III

PROCEDURES

Source Of Data

Local livestock auction markets are an important outlet for U.S. livestock producers. Oklahoma livestock auctions are a critical link in the vertical livestock marketing channel. They serve as a vital link between buyer and seller as seen in Figure 1. Furthermore, auction markets facilitate the performance of economic activities within and between the channels of the marketing system shown in Figure 2.

In this study, local livestock auction markets are defined as those markets having a one to two county trade area; not classified as a commission company or a terminal market (Oklahoma City, Tulsa, Ft. Smith, Arkansas); and those markets which do not, under normal circumstances, take title to livestock. Local auction market services include the assembly of livestock, as well as the arrangement and supervision of competitive price bidding among potential buyers.

A major objective of this study is to determine the impact of managerial attitudes and operational practices on the auction market industry. The majority of previous studies of local livestock auction markets dealt only with conducting cost analyses to determine operational efficiency. To gain insight into managerial procedures and attitudes, as well as, cost records, two sources of data collection

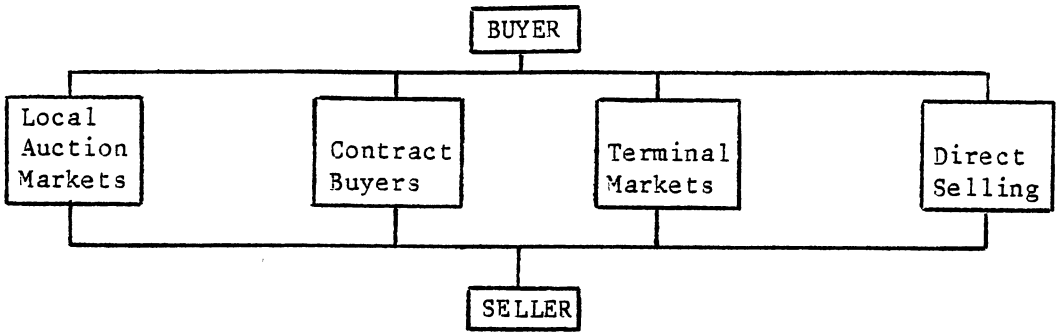

Figure 1. Vertical Linkages in the Oklahoma Livestock Marketing System

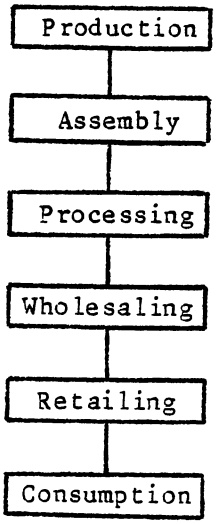

Figure 2. Vertical Marketing Channel

were used.

A mail-out survey was designed to provide a descriptive picture of the overall internal and external conditions, and influences on the operational characteristics of local auctions. A copy of the mail-out survey is in Appendix A. The survey was developed and tested with the help of several auction market operators and the Oklahoma Area Representative of the National Livestock Marketing Association. Descriptive characteristics such as major areas of concern, the frequency and success of special livestock sales, attitudes toward and use of electronic livestock marketing, and membership and participation in livestock marketing organizations were measured. In addition to the descriptive aspects, a portion of the survey dealt with physical plant facilities, and labor and salary expenses.

The mail-out questionnaires were mailed to all Oklahoma livestock auction markets with one follow up mailing to nonrespondents. Respondents included 20 auction firms from a universe of approximately 60. Seventeen of the responses were from local livestock auction markets. The three remaining responses are classified as terminal markets (Oklahoma City, Tulsa, and Ft. Smith, Arkansas).

Data for the cost analysis of Oklahoma livestock auction markets were gathered from the Packers and Stockyards Administration Form 130 for 1983, which is in Appendix B. All operating auctions in Oklahoma are required to file this report annually with the Oklahoma office of the Packers and Stockyards Administration, United States Department of Agriculture. The Form 130 is an annual report which includes a balance sheet of assets and liabilities, reconciliation of net worth, summary of income statements, a separate income statement for the auction activity,

detail of market support activity and dealer operations, and volume of livestock handled during the year. The name and address of each auction operator were deleted from the data to insure confidentiality of account records. A total of 59 usable observations were available for this study.

The Survey

Animal Unit

In order to put the auctions on a more homogenous basis for the purpose of cost analysis, the volume of livestock handled by each auction was converted to a market or animal unit base. Animal marketing units classification requires that heterogeneous livestock species be converted to a common unit of measure. The cost of handling and selling each species varies, and the proportion of different types of livestock sold varies among markets. The conversion rates for various classes of livestock have varied in previous studies.

Polishuk and Buccola (1978) developed their own conversion factors based on respective marketing costs. Polishuk and Buccola regressed total annual costs against the number of animals marketed by 32 firms for the years 1975-1976, and used dummy variables to represent discrete pen space or holding capacity categories. Using cattle as a base unit, the animal unit equivalents of one head of each species were obtained by dividing the regression coefficient of cattle by each of the regression coefficients of the respective species. Polishuk and Buccola found an animal unit to be one head of cattle, 1.34 calves, 2.01 hogs, 2.61 sheep and lambs, or .49 horses.

Spielman et al. (1983) in their Tennessee study of livestock auction markets used the standard Animal Marketing Unit defined by the USDA as one cow, one calf, three hogs, four sheep, or one horse. These values were determined by equating the amount of pen space and handling costs for each type of livestock.

The animal units used in the 1958 study of Oklahoma auction markets (Lindberg and Judge, 1958) will also be used in this analysis. Each of the following groups will be considered as one animal unit: one head of cattle over 400 pounds; two calves, 400 pounds or less; two hogs; five sheep; or one horse. Cattle are numerically the most important type of livestock handled by the auctions studied and were therefore used as a base in developing the conversion rates.

Size Categories

Local auction markets in Oklahoma were divided into three size categories according to the number of animal units handled. Parameters of these categories and the number of local auctions in each category are shown in Table I. Volume data were available for 59 local auction markets. The small auction category had 37 markets ranging in volume from 1 to 35,000 and averaging 20,043 animal units for 1983. Fifteen auctions were classified as medium sized markets averaging 49,487 animal units and ranging from 35,001 to 70,000. Seven large auctions ranged from 70,001 to 171,000 animal units averaging 95,724 for 1983.

TABLE 1

NUMBER AND AVERAGE VOLUME FOR OKLAHOMA LIVESTOCK AUCTION MARKETS BY SIZE GROUP

Size Group	Volume Handled Per Year	1983	
		Number of Markets	Average Volume Handled
Small	1-35,000	37	20,043
Medium	35,001-70,000	15	49,487
Large	70,001-171,000	7	95,724
Total	0-171,000	59	36,508

Descriptive Characteristics

The mail-out survey in Appendix A was used to determine auction market operator attitudes concerning four major descriptive characteristics: (1)identification of critical problem areas; (2)frequency and success of special livestock sales; (3)use and success of electronic livestock marketing; and (4)membership and participation in livestock marketing organizations. Seventeen local auction markets responded to the mail-out survey representing 28.3 percent of the local markets in Oklahoma. In addition, three terminal markets responded to the mail-out survey: Oklahoma City; Tulsa; and Ft. Smith, Arkansas.

Potential areas of concern faced by Oklahoma auction markets were identified via the mail-out survey by asking survey respondents to categorize thirteen potential areas as no problem, minor problem, major problem, or critical problem. Potential problem areas included:

declining number of buyers; declining livestock volume; high record-keeping costs; high labor costs; availability of labor; slow payment by buyers; undeclared livestock liens; credit availability; facility maintenance; Packers and Stockyards Administration regulations; and animal health regulations. In addition, auction market operators were asked to categorize any other problem areas not listed. Survey respondents were also requested to identify the most important problem facing the livestock auction industry in Oklahoma.

The survey also attempted to determine the effectiveness of special livestock sales by measuring what types of livestock were sold at special sales, the frequency of special sales, the number of buyers at special sales compared to weekly sales, and the number of consignors participating in special sales compared to weekly sales. Auction operators were also asked to rate the overall success of special livestock sales, as well as their plans regarding continuation and expansion of special sales.

Bell et al. (1983) defined electronic marketing as the use of telecommunications and data processing equipment to facilitate the trading of agricultural products. Electronic marketing creates a centralized trading arena where large numbers of buyers and sellers can interact without physical assembly of buyers, sellers, and products. Trading is based on descriptions of products, rather than by personal inspection. With this definition as a foundation, the mail-out survey measured factors influencing auction market operators' attitudes concerning electronic livestock marketing. The survey determined the use and level of success of computers for record-keeping, the level of knowledge of auction operators toward electronic livestock marketing,

and the degree of use and success of any form of electronic marketing. Respondents categorized eleven statements about electronic marketing by checking: strongly agree; agree; neutral, no opinion, or not applicable; disagree; or strongly disagree. The eleven statements were: familiarity with electronic marketing; electronic marketing could increase the number of buyers participating at auctions; buyers could reduce costs through electronic marketing; livestock can be sold effectively by description; electronic marketing could improve producer prices; electronic marketing could benefit auction markets; electronic marketing could benefit producers; electronic marketing could benefit buyers; wide use of electronic marketing to buy and sell livestock within ten years; personal use of electronic marketing by operator's auction market within five years; and general use of electronic marketing by most auction markets within five years. Auction operators also listed the major benefits and major disadvantages of electronic marketing.

Finally, the mail-out survey explored the level of Livestock Marketing Association (LMA) membership, the effectiveness of LMA educational meetings, and the possibilities of expanding present LMA services.

Cost Analysis

One area of the mail-out survey dealt with labor and salary expenses of local auction markets. Respondents were asked what percentage of total expenses were devoted to the following functions: weighing livestock; handling livestock; management; the auctioneer; clerical accounting expenses; accountant; veterinary expenses; and other

expenses. These responses will be used with the Packers and Stockyards Administration Form 130 information to conduct this study's cost analysis section.

THEORY

Cost Analysis

The efficiency of the livestock marketing system depends to a large extent upon how efficient livestock auction markets perform their function. Inefficient resource utilization may lead to excessive operating expenses for auctions. The high costs must be borne by some segment of the livestock and meat system. High costs incurred by auction operators may lead to increased tariff rates (Spielman et al., 1983). These higher tariffs may reduce returns to producers who sell livestock at auctions and may increase costs of livestock to the buyer.

The logical framework for firm cost and efficiency in this study can be based, with some alterations, on the logical formulations of the conventional economic theory of production. This section will present only a brief discussion of the logic necessary for evaluating the operation of firms and postulating models from which relevant economic relationships can be estimated.

In general, a firm may be defined as an institution which buys raw materials, transforms them in some manner, and then resells the new product or service with the purpose of making a profit from the transition. An operating firm is faced with prices for the resources it uses which are the cost of the inputs used in the transformation process. Also, there is given in the market, a price for the firm's finished product or service. At different levels of output and the

necessary amounts of inputs, the firm is faced with varying costs of production and subsequent revenue from its sale. If profit maximization is one of the firm's major goals, the firm should build the scale of plant which provides the greatest divergence of revenue over costs in conjunction with the demand for its product and the supply of its inputs. In the case of auction markets, many of the physical facilities are already in existence; therefore, operating auctions must determine the optimum volume of livestock sold to maximize profits.

In any particular firm there are technical restrictions which control and determine the relationship between the inputs of productive factors and the outputs of products or services. These physical restrictions in auctions may include the existing arrangement of pens and equipment, the integration of total operations, and the abilities of the manager and hired labor (Lindberg and Judge, 1958). Given these restrictions, the productive inputs can be divided into: (1) variable inputs or costs - those inputs that vary with the volume of products or services sold; and (2) fixed inputs or costs - those inputs that are a function of time and therefore independent of the volume of products or services provided. When these inputs are combined in the production process, a physical production function is obtained which describes the relationship between the level of inputs and the level of outputs for a particular firm and time period.

The physical production function expressing the relationship between inputs and outputs is basic to the determination of cost relationships for the particular firm, since the cost of producing a given output is the quantity of input used times their respective prices. Together, the fixed and variable inputs, or costs, reflect a

relationship that describes the effect of output changes on inputs or costs of operation (Lindberg and Judge, 1958).

Thus far, the theory presented concerns only a short run analysis. In the long run all factors are variable. Therefore, the long run situation may be approached through short run analysis by considering the costs for a series of firms similar in type but differing in size or capacity. In the long run it is possible to build firms of any given size; therefore, the family of total cost functions generated by firms of alternative sizes could be used to construct the long run total cost curve. For this study the total relationships will be transformed into more familiar terms of average or unit cost curves (Lindberg and Judge, 1958).

Estimating the long run average total cost (LRATC) function for local auction markets will help determine the effect of volume and scale on operating costs. The LRATC curve is a graphical representation between average total cost and volume of output for the firm. Spielman et al. (1983) used two methods to estimate a LRATC curve for the Tennessee livestock auction market industry, the ordinary least squares (OLS) method of regression and the frontier function method. The OLS method and the frontier function method will also be used in this study to determine the LRATC curve.

Economic theory suggests many potential functional forms. Two functional forms were hypothesized as potentially appropriate for estimation of LRATC:

$$LRATC = a + b_1V + b_2V^2 \qquad (1)$$

$$LRATC = a + b_1V + b_2V^2 + b_3V^3 \qquad (2)$$

where: LRATC = Total cost per animal unit

V = Volume or number of animal units handled per year in thousands.

These two functional forms will be used in this study, to estimate auction costs and profitability. The functional form providing the best fit for Oklahoma auction costs and profits will be selected as the OLS estimator. The LRATC estimate represents the minimum operating expense obtainable at various levels of output.

Profit Analysis

Previous studies have only evaluated the effect of changing animal volume on auction firm costs. This study will attempt to go one step further by taking an innovative look at the effect of livestock volume sold on profit.

The two OLS estimation models used to predict LRATC will also be used to estimate profit per animal unit. Again, the functional form providing the best fit will be used as the OLS estimate of auction market profitability.

CHAPTER IV

RESULTS

Selected Characteristics

Data received from the mail-out survey were compiled and results calculated following the procedures outlined in Chapter III. Computations were facilitated through the use of a Harris 1660 minicomputer and the Statistical Analysis System (SAS) package.

The results from this study dealing with local auction operators' attitudes toward potential areas of concern, special livestock sales, electronic livestock marketing, and marketing association memberships are presented in Tables II through VIII. Local auction markets were classified as small, medium, and large based on volume of animal units sold in 1983 through normal auction functions, excluding market support accounts and dealer operations. Classifications were: small auctions sold 1-35,000 animal units; medium auctions sold 35,001-70,000 animal units; and large auctions sold 70,001-171,000 animal units.

Table II presents the number of livestock auction markets in each size group and the volume of animal units sold by each size category. Although the small auction category has a definite advantage in the number of individual auctions, 62.7 percent of the total number of local auctions, the volume of livestock sold is relatively even for each size group. Each size category handles approximately 30 to 35 percent of livestock sold, while the medium auctions make up 25.4 percent of the

TABLE II

NUMBER AND LIVESTOCK VOLUME SOLD FOR LOCAL
OKLAHOMA LIVESTOCK AUCTION MARKETS
BY SIZE GROUP

Size Group (Volume Range)	Number of Auction Markets	Percent of Total Number of Auction Markets	Total Volume of Livestock Sold	Percent of Total Volume of Livestock Sold
Small (1-35,000)	37	62.71	741,574.0	34.43
Medium (35,001-70,000)	15	25.42	742,307.0	34.46
Large (70,001-171,000)	7	11.86	670,066.0	31.11
Total	59	99.99	2,153,947.0	100.00

Source: 1983 Survey Data, Appendix B, Section 6.

total number of auctions, and the large auctions constitute only 11.8 percent of the total number of auctions.

Table III shows the average number of livestock handled by species for 59 local Oklahoma auctions categorized by size group. Cattle and calves are numerically the most important type of livestock handled by local auction markets in Oklahoma.

Areas of Concern

The mail-out survey questioned local auction managers about potential areas of concern for local auction markets. Twelve categories were listed as potential problems in question 5 of the survey. The responses ranged from no problem to critical problem. Table IV presents the rankings of these twelve concerns by size category. Rankings were based on the average response for each size category and are ranked as 1 = most important problem to 12 = least important problem. Small and medium auctions agree that animal health regulations are the most critical problem area for local auction markets, with high labor costs being the second most important area of concern. However, small auctions consider high record-keeping costs as their third most pressing problem; while declining livestock volume, labor availability, buyer default, undeclared livestock liens, and facility maintenance tied as the third most important area of concern for medium auctions. Medium auctions considered high record-keeping costs the ninth most important problem area. Both small and medium auction markets considered credit availability the least important area of concern. None of the respondents to the mail-out survey represented large auction markets.

TABLE III

AVERAGE NUMBER OF LIVESTOCK HANDLED PER SPECIES
BY LOCAL OKLAHOMA LIVESTOCK AUCTION MARKETS
BY SIZE GROUP

Size Group (Volume Range)	Cattle	Calves	Hogs	Sheep	Horses
	- - - - -Frequency(Percent of Total Responses)- - - - -				
Small (1-35,000)	18,568 (12.1)	7,416 (13.1)	2,465 (39.8)	1,566 (15.1)	815 (54.2)
Medium (35,001-70,000)	44,141 (28.6)	30,781 (54.6)	2,483 (40.0)	8,710 (84.2)	146 (9.7)
Large (70,001-171,000)	91,407 (59.3)	18,219 (32.3)	1,252 (20.2)	74 (.7)	542 (36.1)
Total	154,116 (100.0)	56,416 (100.0)	6,200 (100.0)	10,350 (100.0)	1,503 (100.0)
Overall Average	34,243	14,040	2,382	3,098	666

Source: 1983 Survey Data, Appendix B, Section 5.

TABLE IV

SUMMARY RANKINGS OF POTENTIAL AREAS OF CONCERN FOR 17 LOCAL OKLAHOMA LIVESTOCK AUCTION MARKETS BY SIZE GROUP

Area of Concern[2]	Rank for Small Auctions[1] (1-35,000)	Average Response for Small Auctions	Rank for Medium Auctions[1] (35,001-70,000)	Average Response for Large Auctions
Declining Number of Buyers	8	1.6	8	2.0
Declining Livestock Volume	7	1.7	3	2.2
High Costs of Record Keeping	3	2.1	9	1.8
High Labor Costs	2	2.3	2	2.4
Availability of Labor	10	1.5	3	2.2
Slow Payment by Buyers	10	1.5	10	1.6
Buyer Default	6	1.8	3	2.2
Undeclared Livestock Liens	5	1.9	3	2.2
Credit Availability	12	1.4	12	1.2
Facility Maintenance	8	1.6	3	2.2
P & S Regulations	4	2.0	11	1.4
Animal Health Regulations	1	2.9	1	3.4

[1]Rankings are most important to least important based on average response for each size group.

[2]Response Range: 1 = No Problem, 2 = Minor Problem, 3 = Major Problem, 4 = Critical Problem

Source: 1983 Survey Data, Appendix A, Question 5.

Special Livestock Sales

Questions 7 through 9 of the mail-out survey (Appendix A) asked auction operators their opinions concerning special livestock sales. Table V indicates the frequency of special livestock sales held by each auction market size group. Over forty-seven percent of the small and medium auction operators responding held special livestock sales throughout the year. Special sales are held anywhere from 17 times a year to biannually. Table VI shows the types of livestock sold during these special sales. Breeding cattle and horses were the most frequent type of special livestock sold by both small and medium auctions. Special stocker cattle and feeder cattle sales were also held by small auction markets. More buyers usually attend special livestock sales and about the same number to fewer consignors attend special sales when compared to regularly scheduled weekly sales as shown in Table VII.

In addition, 87.5 percent of the auctions presently conducting special livestock sales deem these sales as very successful or successful, and 100.0 percent of these operators plan to expand or continue their present course concerning special sales. Also, 70.0 percent of those auctions not presently conducting special sales plan to conduct these sales in the future. Overall, local auction operators express a very positive attitude toward special livestock sales. Data dealing with large auction managers' attitudes toward special livestock sales were unavailable.

TABLE V

FREQUENCY AND PERCENT OF SPECIAL LIVESTOCK SALES HELD BY SIZE GROUP

Size Group (Volume)	Auctions Holding Special Livestock Sales	Auctions Not Holding Special Livestock Sales	Total Number of Responses by Size Group
	- - - - -Frequency (Percent of Total Responses)- - - - -		
Small Group (1-35,000)	8 (47.1)	4 (23.5)	12 (70.6)
Medium Group (35,001-70,000)	0 (0.0)	5 (29.4)	5 (29.4)
Large Group (70,001-171,000)	N.A.	N.A.	N.A.
Total Number of Responses	8 (47.1)	9 (52.9)	17 (100.0)

N.A. = Not Available

Source: 1983 Survey Data, Appendix A, Question 7.

TABLE VI

TYPES OF LIVESTOCK SOLD DURING SPECIAL LIVESTOCK SALES BY SIZE GROUP

Type of Livestock Sold	Small Size Group (1-35,000)	Medium Size Group (35,001-70,000)	All Local Auction Markets
	- - - - -Frequency (Percent of Total Responses- - - - -		
Stocker Cattle	3 (17.7)	0 (0.0)	3 (17.7)
Feeder Cattle	2 (11.8)	0 (0.0)	2 (11.8)
Slaughter Cattle	0 (0.0)	0 (0.0)	0 (0.0)
Breeding Cattle	5 (29.4)	1 (5.9)	6 (35.3)
Cull Cows	0 (0.0)	0 (0.0)	0 (0.0)
Horses	5 (29.4)	1 (5.9)	6 (35.3)
Slaughter Hogs	0 (0.0)	0 (0.0)	0 (0.0)
Feeder Lambs	0 (0.0)	0 (0.0)	0 (0.0)
Slaughter Lambs	0 (0.0)	0 (0.0)	0 (0.0)
Breeding Lambs	0 (0.0)	0 (0.0)	0 (0.0)

Source: 1983 Survey Data, Appendix A, Question 7a.

TABLE VII

FREQUENCY AND PERCENT OF BUYERS AND CONSIGNORS AT SPECIAL LIVESTOCK SALES COMPARED TO REGULARLY SCHEDULED SALES BY SIZE GROUP

Comparison Questions	Small Size Group (1-35,000)	Medium Size Group (35,001-70,000)	Total Number of Responses
	-Frequency (Percent of Total Responses)-		
More Buyers Attend Special Sales	6 (33.3)	1 (5.6)	7 (38.9)
Same Number of Buyers Attend Special Sales	1 (5.6)	0 (0.0)	1 (5.6)
Fewer Buyers Attend Special Sales	1 (5.6)	0 (0.0)	1 (5.6)
More Consignors Attend Special Sales	0 (0.0)	0 (0.0)	0 (0.0)
Same Number of Consignors Attend Special Sales	3 (16.7)	0 (0.0)	3 (16.7)
Fewer Consignors Attend Special Sales	5 (27.8)	1 (5.6)	6 (33.3)

Source: 1983 Survey Data, Appendix A, Questions 7c and 7d.

Computer Usage

Few local auction operators use computers for any type of managerial activities or livestock marketing. Only 11.7 percent of local auctions in Oklahoma use computers for record keeping activities, and only half of these operators were satisfied with computerized accounting. Most local operators are familiar with some type of electronic livestock marketing, 94.1 percent; however, only 29.4 percent of these operators have actually used electronic livestock marketing. Sixty percent of these operators thought their electronic marketing experience was extremely successful or successful, while 50.0 percent plan to use electronic marketing in the future.

Electronic Marketing

Table VIII summarizes local operators' general attitudes toward electronic livestock marketing by size group. Of those expressing an opinion, small and medium operators are familiar with electronic marketing; however, most operators do not consider electronic marketing as a beneficial marketing method. These operators do not believe that electronic marketing could reduce buyer costs; benefit producers, buyers, or auction markets; or improve producer prices. Furthermore, local operators do not perceive wide use of electronic marketing by the auction market industry in the near future. These results are based on responses to question 13 of the mail-out survey (Appendix A). Data were unavailable for large auction operators.

Major benefits of electronic marketing include convenience, less stress and shrinkage of livestock, reduction of employee numbers, and

TABLE VIII

AUCTION OPERATORS' ATTITUDES CONCERNING ELECTRONIC LIVESTOCK MARKETING BY SIZE GROUP

Question	Small Auctions					Medium Auctions					Total Number of Responses
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	
	-Frequency (Percent of Total Responses)-										
Familiar With Electronic Marketing	1 (5.9)	5 (29.4)	5 (29.4)	0 (0.0)	1 (5.9)	1 (5.9)	1 (5.9)	3 (17.6)	0 (0.0)	0 (0.0)	17 (100.0)
Electronic Marketing Could Be Used to Increase Buyer Participation	1 (6.3)	3 (18.8)	5 (31.3)	2 (12.5)	1 (6.3)	0 (0.0)	0 (0.0)	3 (18.8)	1 (6.3)	0 (0.0)	16 (100.3)
Electronic Marketing Could Reduce Buyer Costs	1 (6.3)	1 (6.3)	6 (37.5)	3 (18.8)	1 (6.3)	0 (0.0)	1 (6.3)	1 (6.3)	2 (12.5)	0 (0.0)	16 (100.3)
Livestock Can Be Sold Effectively By Description	1 (6.3)	1 (6.3)	3 (18.8)	5 (31.3)	2 (12.5)	0 (0.0)	0 (0.0)	1 (6.3)	3 (18.8)	0 (0.0)	16 (100.3)
Electronic Marketing Could Improve Producer Prices	1 (6.3)	1 (6.3)	5 (31.3)	3 (18.8)	2 (12.5)	0 (0.0)	0 (0.0)	2 (12.5)	2 (12.5)	0 (0.0)	16 (100.2)
Electronic Marketing Could Benefit Auction Markets	1 (6.3)	0 (0.0)	6 (37.5)	3 (18.8)	2 (12.5)	0 (0.0)	2 (12.5)	0 (0.0)	2 (12.5)	0 (0.0)	16 (100.1)
Electronic Marketing Could Benefit Producers	1 (6.3)	1 (6.3)	6 (37.5)	2 (12.5)	2 (12.5)	0 (0.0)	0 (0.0)	2 (12.5)	2 (12.5)	0 (0.0)	16 (100.1)
Electronic Marketing Could Benefit Buyers	1 (6.3)	1 (6.3)	7 (43.8)	1 (6.3)	2 (12.5)	0 (0.0)	0 (0.0)	2 (12.5)	2 (12.5)	0 (0.0)	16 (100.2)
Wide Use of Electronic Livestock Marketing in Ten Years	1 (6.3)	1 (6.3)	5 (31.3)	3 (18.8)	2 (12.5)	0 (0.0)	1 (6.3)	1 (6.3)	2 (12.5)	0 (0.0)	16 (100.3)
Personal Use of Electronic marketing by Auction in Five Years	0 (0.0)	1 (6.3)	5 (31.3)	3 (18.8)	3 (18.8)	0 (0.0)	0 (0.0)	1 (6.3)	3 (18.8)	0 (0.0)	16 (100.3)
Electronic Marketing Used by Most Auctions in Five Years	0 (0.0)	1 (6.3)	6 (37.5)	2 (12.5)	3 (18.8)	0 (0.0)	1 (6.3)	1 (6.3)	2 (12.5)	0 (0.0)	16 (100.2)

Source: 1983 Survey Data, Appendix A, Question 13.

less transportation according to local auction managers. Major disadvantages are no physical inspection, incorrect livestock descriptions, confusing grade categories, and lack of personal contact between auction participants.

National Livestock Marketing Association

Finally, local auction markets were surveyed about livestock marketing organizations and association programs in questions 17 through 19 of the mail-out survey (Appendix A). Forty percent of the local auctions surveyed are members of the National Livestock Marketing Association (LMA), Kansas City, Missouri; while 71.4 percent of these members attend educational LMA meetings. Association members believe LMA educational programs are helpful in keeping up-to-date on current auction market issues, but concede that these programs are difficult to attend and fit into their schedules. LMA members find that the association's most helpful services include aid in legal work, financial investigations, transaction alerts, credit reports, insurance, and trade information. However, 83.3 percent of the association members would like a more active LMA in such areas as government regulations, legislative actions, and auction market responsibilities concerning mortgaged livestock. In addition, 50.0 percent of local auction operators are members of other livestock marketing organizations: the Oklahoma Livestock Marketing Association; the Oklahoma Cattleman's Association; the American Stockyards Association; and the Texas and Southwestern Cattle Raisers Association.

Summary of Selected Characteristics

Table IX summarizes local auction market operators use of special livestock sales, computers, electronic livestock marketing, and the Livestock Marketing Association by size group. As Table IX shows, small auctions hold special livestock sales more frequently, and are more active in computer usage and electronic livestock marketing than are medium auctions. In addition, more small auctions are members of livestock marketing organizations.

Additional information concerning local auction market operators' attitudes and ideas about labor and salary expenses, potential areas of concern, special livestock sales, electronic livestock marketing, and marketing association membership are summarized in the mail-out survey in Appendix A. These summary statistics include all local auction respondents and are not classified by auction market size.

Appendix C illustrates the importance of labor and salary expenses to the entire local auction market industry, and Appendix D summarizes managerial characteristics of the three terminal auction markets selling Oklahoma livestock (Oklahoma City, Tulsa, and Ft. Smith, Arkansas).

COST ANALYSIS

The results for the cost analysis section of this study dealing with labor and salary expenses were obtained through evaluation of question 4 of the mail-out survey in Appendix A. Further cost analysis data were determined by examining Section 6 of the Packers and Stockyards Administration survey in Appendix B.

Table X displays the importance of labor and salary expenses as

TABLE IX

SUMMARY OF MANAGERIAL ATTITUDES FOR LOCAL OKLAHOMA AUCTION MARKETS BY SIZE GROUP

Response Area	Small (1-35,000)	Medium (35,001-70,000)	
	- - - - -Frequency (Percent of Total Responses)- - - - -		
Auctions Holding Special Sales	8 (47.1)	0 (0.0)	8 (47.1)
Use of Computer in Auction Operations	2 (11.8)	0 (0.0)	2 (11.8)
Have Used Electronic Marketing	3 (17.6)	2 (11.8)	5 (29.4)
Members of LMA[1]	5 (29.4)	1 (5.9)	6 (35.3)

[1] LMA = Livestock Marketing Association.

Source: 1983 Survey Data, Appendix A.

TABLE X

SUMMARY RANKINGS OF LABOR AND SALARY EXPENSES AS A PERCENTAGE OF TOTAL EXPENSES FOR 17 LOCAL OKLAHOMA AUCTION MARKETS BY SIZE GROUP

Labor and Salary Expenses	Small Auctions (1-35,000)			Medium Auctions (35,001-70,000)		
	Average Percentage of Total Expenses	Range of Percent	Rank[1]	Average Percentage of Total Expenses	Range of Percent	Rank[1]
Weighing Livestock	6.1	2.0 - 17.0	7	3.2	1.0 - 5.0	8
Handling Livestock	41.7	5.0 - 75.0	1	61.2	52.0 - 90.0	1
Management	12.6	2.0 - 26.0	2	15.3	1.0 - 25.0	2
The Auctioneer	10.0	2.0 - 20.0	5	6.0	2.0 - 12.0	4
Clerical Accounting	12.2	1.5 - 24.0	3	10.6	1.0 - 21.0	3
Accountant	7.1	0.0 - 20.0	6	5.3	0.0 - 14.0	5
Veterinary	11.1	1.0 - 30.0	4	3.5	0.0 - 10.0	7
Other	2.5	2.5 - 2.5	8	4.0	4.0 - 4.0	6

[1]Rankings are most important to least important based on average response for each size group.

Source: 1983 Survey Data, Appendix A, Question 4.

a percentage of total expenses by size group for local Oklahoma auctions. Both small and medium sized auction markets rank the handling livestock function as the largest expense incurred by local auctions. Management and clerical expenses rank second and third respectively. Weighing livestock is the smallest expense according to medium auctions, while the smallest expense for small auctions is the other category including insurance, cleaning pens, and feeding expenses. Rankings were based on average responses for each size group with 1 = most important to 8 = least important. Data were unavailable for large auction markets.

Table XI presents long run average total costs (LRATC) per animal unit for local Oklahoma auctions by size group. Definite total cost advantages are evident as livestock volume sold increases. Average total costs incurred by each size category were: small auctions, $7.76/animal unit (A.U.); medium auctions, $6.06/A.U.; and large auctions $5.50/A.U. This relationship between cost level and volume is as theory suggests: as volume increases, average total costs per animal unit decreases.

The ordinary least squares method (OLS) and the frontier function method were used to estimate the long run average total cost (LRATC) curve for the Oklahoma livestock auction market industry and are shown in Figure 3. The ordinary least squares (OLS) method of regression uses cross-section data in a regression of average total cost against volume to estimate the LRATC function.

As explained in Chapter III, two functional forms were used in the OLS regression estimation. The estimate given by Model 2 was selected as the best OLS functional form of the LRATC function because it

TABLE XI

AVERAGE TOTAL COSTS PER ANIMAL UNIT FOR LOCAL OKLAHOMA AUCTION MARKETS BY SIZE GROUP

Size Group (Volume Range)	Mean	Standard Deviation	Range
Small (1-35,000)	$7.76	$4.76	$0.57-$26.70
Medium (35,001-70,000)	$6.06	$2.14	$3.00-$11.40
Large (70,001-171,000)	$5.50	$2.40	$2.30-$10.00
Total	$7.06	$4.08	$0.57-$27.00

Source: 1983 Survey Data, Appendix B, Section 6.

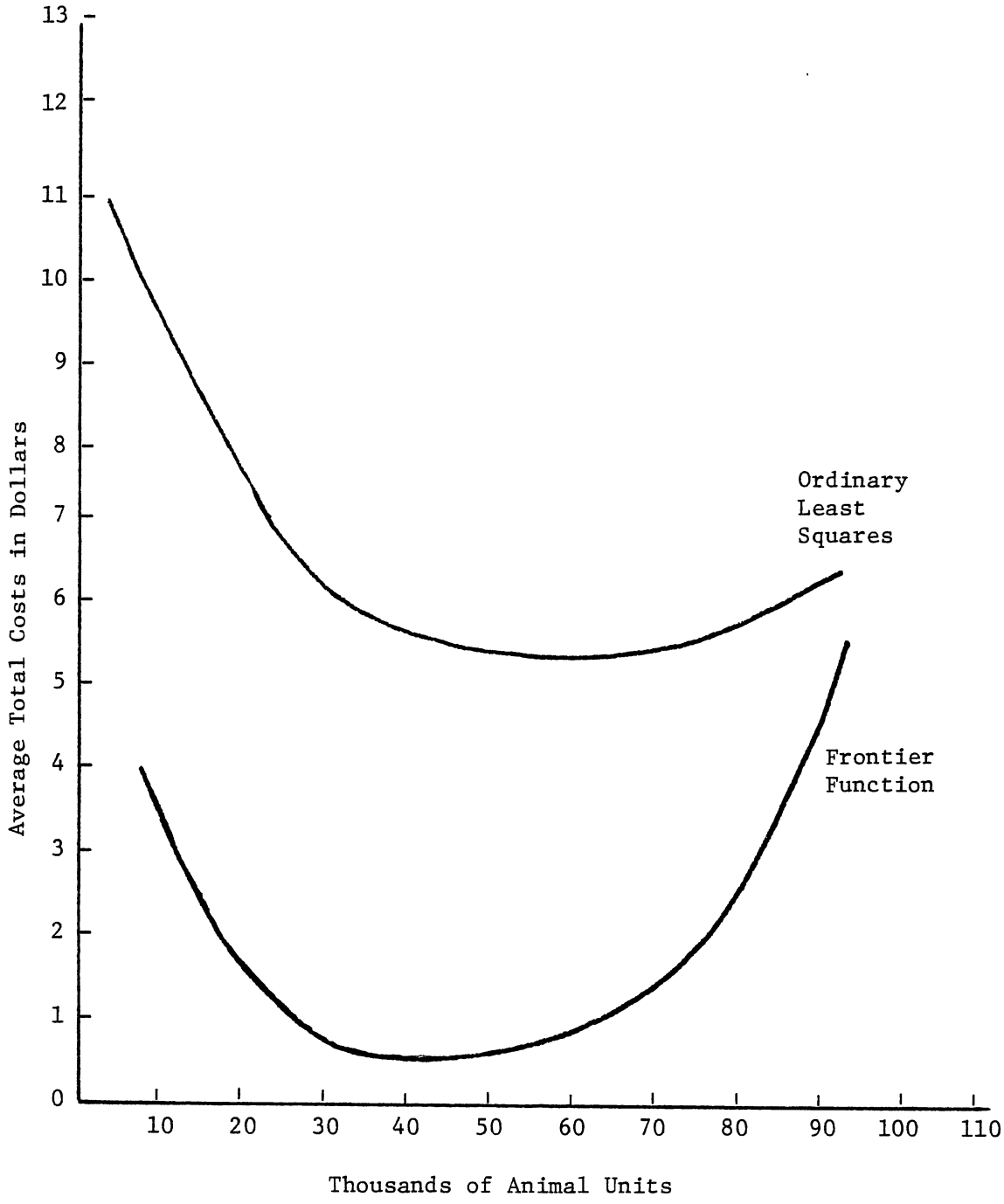

Figure 3. Long Run Average Total Cost Functions for the Local Oklahoma Livestock Auction Market Industry

Source: 1983 Survey Data, Appendix B, Section 6.

provided the best fit, with theoretically correct signs that were statistically significant. The LRATC curve estimated by OLS is given below and graphed in Figure 3.

$$LRATC = 11{,}900. - .28V + 0.0000036V^2 - 0.0000000000129\ V^3 \qquad (3)$$

(0.0001) (0.0183) (0.0619) (0.1072)

$R^2 = .15$; Durbin-Watson "D" = 2.03; n = 59.

The numbers in parentheses below the estimated coefficients are observed significance levels for the two-tailed test that the coefficients are equal to zero. The results of the OLS estimate presented in Figure 3 indicate that economies of size do exist in Oklahoma livestock auction markets.

Figure 3 also presents the frontier function method of LRATC estimation which fits an envelope curve to the bottom points of a scatter diagram of average total costs plotted against volume. This LRATC estimate represents the minimum operating expense obtainable at various levels of output.

Table XII summarizes average variable costs for the Oklahoma auction market industry by size group. As apparent with average total cost, large auctions experience lower average variable costs per animal unit (A.U.). Small auctions incur average variable costs of $6.04/A.U.; medium auctions, $4.44/A.U.; and large auctions, $4.10/A.U. Again, as volume increases average variable costs per animal unit decreases.

Table XIII indicates average fixed costs for local Oklahoma auctions by size group. As with average total cost and average variable cost, large auctions incur lower per head fixed cost. Average fixed cost for each size category were: small auctions, $1.73/A.U.; medium auctions, $1.62/A.U.; and large auctions, $1.40/A.U.

TABLE XII

AVERAGE VARIABLE COSTS FOR LOCAL OKLAHOMA AUCTION MARKETS BY SIZE GROUP

Size Group (Volume Range)	Mean	Standard Deviation	Range
Small (1-35,000)	$6.04	$4.09	$0.57-$21.30
Medium (35,001-70,000)	$4.44	$1.37	$2.70-$ 7.20
Large (70,001-171,000)	$4.10	$1.87	$1.80-$ 7.00
Total	$5.40	$3.45	$0.57-$21.00

Source: 1983 Survey Data, Appendix B, Section 6.

TABLE XIII

AVERAGE FIXED COSTS FOR LOCAL OKLAHOMA AUCTION MARKETS BY SIZE GROUP

Size Group (Volume Range)	Mean	Standard Deviation	Range
Small (1-35,000)	$1.73	$1.16	$0.0 -$ 5.40
Medium (35,001-70,000)	$1.62	$1.05	$0.20-$ 4.20
Large (70,001-171,000)	$1.40	$0.87	$0.50-$ 3.00
Total	$1.66	$1.09	$0.00-$ 5.00

Source: 1983 Survey Data, Appendix B, Section 6.

Table XIV summarizes average variable costs, average fixed costs, and average total costs per animal unit for each size group of local Oklahoma auction markets. For each size category average variable costs per animal unit are considerably higher than average fixed cost per animal unit. In addition, average total costs decrease as livestock volume sold increases as economic theory suggests.

TABLE XIV

SUMMARY OF COSTS FOR LOCAL OKLAHOMA LIVESTOCK AUCTION MARKETS BY SIZE GROUP

Size Group (Volume Range)	Average Variable Cost Per Animal Unit	Average Fixed Cost Per Animal Unit	Average Total Cost Per Animal Unit
Small Group (1-30,000)	$6.04	$1.73	$7.76
Medium Group (30,001-70,000)	$4.44	$1.62	$6.06
Large Group (70,001-171,000)	$4.10	$1.40	$5.50
Total	$5.40	$1.66	$7.06

Source: 1983 Survey Data, Appendix B, Section 6.

CHAPTER V

RESULTS

Profit Analysis

Average profit per animal unit sold was calculated to allow comparison of returns or profitability of different sizes of auction market operations. As Table XV indicates medium auction market operations yielded the largest profit per animal unit (A.U.) sold. Small auctions incurred -$1.56/A.U. profit, while medium and large auction markets experienced $0.61/A.U. and $0.30/A.U. profits, respectively. This results would indicate that there is a positive relationship between livestock volume sold and profit per animal unit up to a certain volume level. However, beyond this volume, the rate of increase in profit per animal unit begins to decrease. Eventually profit per animal unit decreases as volume increases.

Figure 4 shows the average return per animal unit for local auction markets in Oklahoma. As in previous analyses, the ordinary least squares (OLS) regression and the frontier function methods were used to estimate long run average profit per animal unit sold. The estimate given by Model 1 was used as the best OLS functional form for profit per animal unit because it provided the best fit, while having theoretically correct signs and statistically significant coefficients. The profit/A.U. curve estimated by OLS is given below and graphed in Figure 4.

TABLE XV

AVERAGE PROFIT PER ANIMAL UNIT FOR LOCAL OKLAHOMA LIVESTOCK AUCTION MARKETS BY SIZE GROUP

Size Group (Volume Range)	Mean	Standard Deviation	Range
Small (1-35,000)	-$1.56	$5.67	-$12.99-$ 2.10
Medium (35,001-70,000)	$0.61	$0.72	-$ 0.00-$ 1.50
Large (70,001-171,000)	$0.30	$0.04	$ 0.30-$ 0.00
Total	-$0.44	$3.84	-$12.99-$ 2.00

Source: 1983 Survey Data, Appendix B, Section 6.

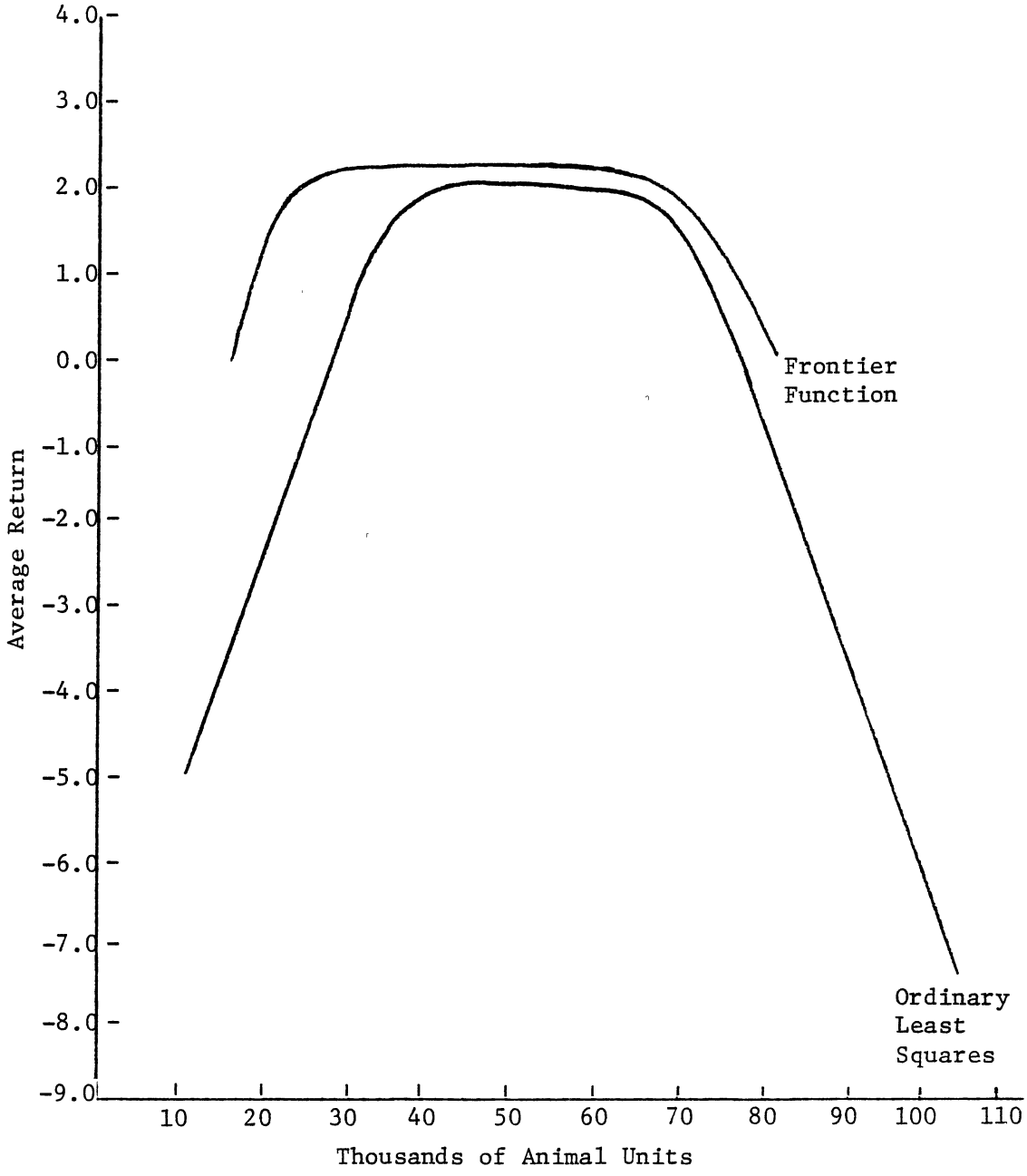

Figure 4. Average Return Per Animal Unit

Source: 1983 Survey Data, Appendix B, Section 6.

$$\text{Profit/A.U.} = -9{,}800 + .47V - 4{,}420V^2 \qquad (4)$$

$$(.0221) \quad (.0337) \quad (.0530)$$

$R^2 = .42$; Durbin-Watson "D" = 1.64; n = 13.

The numbers in parentheses below the estimated coefficients are observed significance levels for the two-tailed test that the coefficients are equal to zero. The results of the OLS estimation presented in Figure 4 indicate that profit per animal unit peaks at approximately 40,000 animal units and remains relatively constant up to approximately 65,000 animal units.

The frontier function method of estimation fits a curve to the maximum observed points of average profit per A.U. also shown in Figure 4. The frontier function indicates that profit per A.U. peaks earlier than the OLS estimation. Profit peaks at approximately 20,000 animal units using the frontier function, and remains relatively constant up to approximately 65,000 animal units.

The results of both the OLS and the frontier function estimates, indicate that there is a wide range of volume at which auction markets can operate and still remain profitable.

Table XVI indicates the average return per animal unit needed to cover fixed costs for the Oklahoma auction market industry by size group. Medium auctions showed the greatest average return to cover fixed costs at $1.89/A.U. Average returns to cover fixed costs for small auctions were $0.59/A.U., and for large markets were $1.70/A.U. Overall, medium auctions experienced the greatest profit per animal unit, as well as the highest return to cover fixed costs per animal unit.

TABLE XVI

AVERAGE RETURN PER ANIMAL UNIT TO COVER FIXED COSTS FOR LOCAL OKLAHOMA LIVESTOCK AUCTION MARKETS BY SIZE GROUP

Size Group (Volume Range)	Mean	Standard Deviation	Range
Small (1-35,000)	$0.59	$4.61	-$ 8.70-$ 3.40
Medium (35,001-70,000)	$1.89	$0.98	$ 0.80-$ 2.90
Large (70,001-171,000)	$1.70	$0.43	$ 1.40-$ 2.00
Total	$1.26	$3.10	-$ 8.70-$ 3.00

Source: 1983 Survey Data, Appendix B, Section 6.

CHAPTER VI

SUMMARY AND CONCLUSIONS

Local livestock auction markets are a crucial part of the livestock marketing sector in Oklahoma with over 2.3 million head of livestock sold through local auctions in 1983.

Local markets vary greatly in the level of livestock volume sold, but each size of auction plays a vital role in the auction market industry. Therefore, it is crucial to accurately determine optimal efficiency levels, as well as the effects of managerial decisions and operator attitudes on the livestock auction market industry.

Although small sized auction markets constitute 62.7 percent of the total number of auction markets, small auctions handle about 34 percent of the livestock sold each year. Medium and large auctions each sell approximately 31 percent of the livestock in Oklahoma.

Overwhelmingly, animal health regulations and high labor costs are the most critical problems facing local Oklahoma auction markets. Throughout this study, from personal interviews to empirical analysis, auction operators singled out government health regulations and brucellosis testing stipulations as major concerns for the auction market industry. In contrast, slow payment by buyers and credit availability are considered minor areas of concern.

Conducting special livestock sales is an additional service offered by many local auctions. Almost half of the local markets conduct

special sales and 87.5 percent consider these sales successful. All markets sponsoring special sales plan to continue them in the future. Furthermore, 70 percent of the auctions not presently conducting special livestock sales plan to do so in the future. Most auction operators consider special sales to be good public relations and advertising that focuses on special interest buyers.

Local operators have a very positive attitude concerning special livestock sales; however, the opposite holds true for electronic livestock marketing. Most operators would be willing to use computers in record-keeping if they proved to be cost effective and if specific computer packages for auctions were available.

Generally, auction managers consider electronic livestock marketing as a threat to local auction market operations. Most managers are familiar with electronic marketing, but few have actually used electronic marketing and few plan to do so in the future. Therefore, the majority of auction markets do not view electronic livestock marketing as beneficial to the auction market, the buyer, or the consignor.

Forty percent of Oklahoma auction markets are members of the National Livestock Marketing Association (LMA). Most of the members consider the LMA's educational programs helpful, but find the meetings are difficult to attend. The LMA may offer the best opportunity to help auctions with government health regulations through cohesive lobbying efforts. Likewise, the LMA may also help match the need of operators for specialized computer packages with educational program services. The LMA could provide a vital educational service.

As in previous studies, this study analyzed the effect of varying

livestock volume on costs. Labor and salary expenses play a major role in determining costs, especially the function of handling livestock, a highly labor intensive function.

One method of evaluating Oklahoma's livestock auction markets in the short run, is the ordinary least squares (OLS) estimate of average costs. However, the OLS function may overestimate the volume needed to achieve most economies of size in the long run (Spielman et al., 1983).

The frontier function approach estimates the theoretical envelope curve fitted to the lowest observed points of the scatter of average costs plotted against volume. The frontier function illustrates the minimum observed cost level for various volumes.

Because several past studies estimated long run total costs for auctions using the OLS method, volumes necessary to achieve economies of size may have been overestimated. Using the OLS estimation, local Oklahoma auction markets selling approximately 55,000 animal units a year would experience the lowest LRATC. In contrast, using the frontier function method, auctions handling only 40,000 animal units a year experienced the lowest costs per animal unit. Results of this study indicate that the level of volume required to achieve a relatively cost efficient operation may not be as large as once thought. The continued existence of many relatively small auction markets in Oklahoma tends to support this conclusion.

Previously conducted studies have taken a relatively narrow view of the local auction market industry. Most studies have only looked at the effect of changing volume on average costs per animal unit. However, changing livestock volume and auction market tariffs can also affect profitability. Results of this study indicate that medium sized auction

markets, handling 35,001 to 70,000 animal units a year, experienced the greatest profits per animal unit. However, it is difficult to determine the exact volume in the medium range which offers the greatest profitability.

Profit per animal unit peaks at 40,000 animal units and remains relatively constant up to approximately 65,000 animal units when using the OLS method of estimation. The frontier function method estimates that profit per animal unit peaks earlier at 20,000 animal units and is relatively constant up to approximately 65,000 animal units. By either estimation method, it is evident that a wide range of auctions handling differing animal volumes and charging different tariffs can be profitable. Profitability in the livestock auction market industry is not restricted to one particular size of auction market.

Many questions concerning the livestock auction market industry still remain unanswered. The effect of operational attitudes on auction market profitability and success must be considered, as well as the effect of volume on costs. Future research dealing with large auction market characteristics and the effect of managerial attitudes on profitability would be helpful in accurately describing the Oklahoma auction market industry. To guarantee a high degree of accuracy in the analysis of local livestock auction markets, both quantitative and qualitative variables must be measured.

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APPENDIX A

LOCAL OKLAHOMA AUCTION MARKET SURVEY

FORM WITH SUMMARY RESPONSES

OKLAHOMA STATE UNIVERSITY
Department of Agricultural Economics
Stillwater, OK 74078

LOCAL AUCTION MARKET SURVEY

Name of livestock auction firm: _____

Address: _____

Phone: ( ) _____

Name of person completing survey: _____

Position: _____

Would you like a copy of the research results sent to you? ___yes; ___no

1. Sale Day: Monday through Saturday
   Time Sale Begins: 8:00 through 4:00

2. Number of Pens: 131.24
   Total Number of 500 lb steers your facilities could hold: 3216.67
   Total Number of 500 lb steers your largest pen could hold: 199.29
   Total Number of 500 lb steers your smallest pen could hold: 16.20

3. Number of employees used in a typical sale during 1982:
   Maximum number: 32.19
   Average number: 26.25
   Minimum number: 20.31

4. Of you total labor and salary expenses during 1982, approximately what percentage was devoted to each of the following functions:

Weighing Livestock	4.83
Handling Livestock	50.17
Management	12.63
The Auctioneer	8.23
Accounting:	
Clerical Expenses	12.5
Accountant	4.87
Veterinary Expenses	6.3
Other (Please Specify)	
insurance, cleaning	.43
pens, feeding,	
welding, miscellaneous service maintenance	
TOTAL	100% (99.96)

(over)

5. For each of the following potential areas of concern indicate if the area has been a problem for your firm.

Area	No Problem	Minor Problem	Major Problem	Critical Problem
Declining number of buyers	9	5	4	0
Declining livestock volume	8	6	3	1
High costs of record keeping	8	3	6	1
High Labor Costs	5	3	7	2
Availability of Labor	8	6	3	0
Slow Payment by Buyers	12	4	1	1
Buyer Default	8	6	2	2
Undeclared Liens on Livestock	7	7	1	3
Availability of Credit	13	4	1	0
Facility Maintenance	8	6	4	0
P & S Regulations	9	5	2	2
Animal Health Regulations	3	2	5	8
Other (Please Specify)				

6. In your opinion, what is the biggest problem(s) facing the livestock auction industry in Oklahoma? health regulations, interest rates, unsupervised government regulations, over regulation of brucellosis testing and cattle movement, country buying, lack of numbers, high labor costs, supply and demand.

What research could OSU do to assist auction markets in overcoming the problem(s)?

research success of bang's testing program, develop simple calf hood vaccine to eliminate blood testing, neighboring state's health regulations, summarize bad check penalties.

7. Do you hold any type of special livestock sale (other than regularly scheduled sales) throughout the year? 9 yes; 9 no

If yes, answer the following questions. If no, skip to question 8.

a. What type of livestock: 3 stocker cattle; 2 feeder cattle; 0 slaughter cattle; 6 cattle for breeding; 0 cull cows; 6 horses; 0 slaughter hogs; 0 feeder lambs; 0 slaughter lambs; 0 lambs for breeding

b. How frequently are the special sales held? ranges from 17 times a year to every other year

c. How many buyers attend these special sale as compared to regularly scheduled weekly sales?
7 more buyers attend special sales
1 about the same number of buyers attend both types of sale
1 fewer buyers attend special sales

d. How many cosigners participate in special sales as compared to regularly scheduled weekly sales?

__0__ more sellers participate in special sales

__3__ about the same number of sellers participate in both types of sale

__6__ fewer sellers participate in special sales

e. How would you rate the overall success of these special livestock sales?

1	7	1	0	0
Extremely Successful	Successful	Neutral	Dissatisfied	Extremely Dissatisfied

f. What are your plans regarding continuation and expansion of your special sales?

3	7	0	0
Expand Effort	Continue Course	Reduce Effort	Stop Handling

Please go directly to question 9.

8. What is the likelihood that you will have special sales in the future?

2	5	2	1	0
definitely yes	probably yes	don't know	probably no	definitely no

9. Would you like help from OSU in organizing (or expanding) special livestock sales?

3	2	3	5	3
definitely yes	probably yes	don't know	probably no	definitely no

If yes, in what areas could assistance be most helpful: special sale - advertising, nationwide success of special livestock sales, general promotion of facility availability

10. Do you use a computer for any of your record keeping? 1 yes; 16 no

If yes, are you satisfied with this method of record keeping? 1 yes; 1 no

If no, what is the likelihood that you will use a computer within the next 3 years?

0	2	3	4	5
definitely yes	probably yes	don't know	probably no	definitely no

Please list any ways in which OSU could be of assistance in this regard:

complete software program specially designed for auction market industry, educational short courses

(over)

11. Have you ever heard of any form of electronic marketing (tele-auctions, video auctions, computerized auctions)? 17 yes; 1 no

    a. If yes, what types of livestock: stocker & feeder cattle, feeder pigs, lambs, cow-calf pairs

    b. If yes, what types of systems: 2 teleauctions; 13 videoauctions; 2 computerized auctions

    c. If yes, has most of the information which you have received about electronic marketing been positive or negative?

0	0	3	4	0
extremely positive	positive	neutral, no response, or not applicable	negative	extremely negative

12. Have vou ever used any form of electronic marketing (tele-auctions, video auctions, computerized auctions)? 5 yes, 13 no

    a. If yes, what types of livestock: stocker & feeder cattle, lambs, cow-calf pairs

    b. If yes, were you:

1	2	1	1	0
Extremely Successful	Successful	Neutral	Dissatisfied	Extremely Dissatisfied

    c. If yes, what is the likelihood you will use the electronic method in the future?

1	2	3	0	0
definitely yes	probably yes	don't know	probably no	definitely no

13. For the following statements please indicate whether you agree or disagree. (frequencies)

	Strongly Agree	Agree	Neutral No Opinion, or Not Applicable	Disagree	Strongly Disagree
I am familiar with electronic marketing	2	7	8	0	1
Electronic marketing could be used to increase the number of buyers participating at my auction	1	3	9	3	1
Buyers could reduce their costs through electronic marketing	2	2	7	5	1
Livestock can be sold effectively by description	1	2	4	8	2
Electronic marketing could improve producer prices	1	1	8	5	2

	Strongly Agree	Agree	Neutral No Opinion, or Not Applicable	Disagree	Strongly Disagree
Electronic marketing could benefit auction markets	1	1	8	3	4
Electronic marketing could benefit producers	1	2	8	4	2
Electronic Marketing could benefit buyers	1	2	9	3	2
I believe electronic marekting will be widely used to buy and sell livestock within ten years	1	3	6	5	2
I believe our auction market will use electronic marketing to some extent, within five years	0	2	6	6	3
I believe most auction markets will use electronic marketing, to some extent, within five years	0	3	7	4	3

14. In order of importance, list what you consider to be the major benefits of electronic marketing:

less transportation of livestock, convenient, less stress and shrinkage of livestock, reduces number of employees needed and labor costs, large number of cattle sold in a short time

15. In order of importance, list what you consider to be the major disadvantages of electronic marketing:

no physical inspection, incorrect description of livestock, confusing grade categories, no personal contact, improper sorting

16. Please list any ways in which OSU could be of assistance to you regarding electronic marketing:

Do not promote electronic marketing

17. Are you a member of the National Livestock Marketing Association? 7 yes; 9 no; If yes, answer the following question. If no, skip to question 18.

a. Have you attended any educational meetings sponsored by the Livestock Marketing Association? 5 yes; 3 no.

How were these meetings helpful? keeping current

How could these meetings have been more helpful? difficult to attend and fit into schedule

(over)

b. What services of the Livestock Marketing Association are most helpful? legal work, financial investigations, transaction alerts, credit reports, insurance, trade information

c. In what areas could the Livestock Marketing Association be more helpful? fighting government regulations, increase field man power, legislative, auction's responsibility for mortgaged cattle and brucellosis program

Please go directly to question 19.

18. If no, why not? didn't know about LMA, cheaper insurance rates elsewhere, does not represent large central markets

Would you like to see a more active Livestock Marketing Association?

5 yes; 1 no.

19. Are you a member of any other livestock marketing organization?

8 yes; 8 no. If yes, please specify: Oklahoma Livestock Marketing Association, Oklahoma Cattleman's Association, American Stockyards Association, Texas and Southwestern Cattle Raisers Association

THANK YOU.

APPENDIX B

PACKERS AND STOCKYARDS ADMINISTRATION

SURVEY FORM WITH SUMMARY RESPONSES

U.S. DEPARTMENT OF AGRICULTURE
PACKERS AND STOCKYARDS ADMINISTRATION

ANNUAL REPORT OF MARKET AGENCY

FORM APPROVED – OMB NO. 0581-0024

This report is required by law (15 U.S.C. 46). Failure to report after notice of default will result in forfeiture to the United States the sum of $100 for each and every day of the continuation of such failure. (15 U.S.C. 50)

INSTRUCTIONS: This report should be filled out by any individual, partnership, corporation, or association engaged in the business of a market agency buying or selling livestock on a commission basis under the provisions of the Packers and Stockyards Act, 1921. If such market agency is also a dealer engaged in the business of buying and selling livestock for its own account, this report may also be used to report its dealer operations in lieu of Form P&S-124. Return this report not later than April 15 following calendar year end or 90 days after close of fiscal period, if business is on other than calendar year basis. If space provided for any item is not sufficient, attach additional sheets containing the information and make reference to section and item number. SEE ENCLOSED INSTRUCTIONS BEFORE COMPLETING THIS REPORT.

RETURN COMPLETED REPORT TO

CERTIFICATION — *I certify that the following report has been prepared by me or under my direction, and that to the best of my knowledge and belief, said report correctly reflects the operations of the reporting firm.*

DATE *(Mo., Day, Yr.)*	TITLE	SIGNATURE *(Owner, Partner, or responsible Officer, if a Corporation)*

REPORT FOR THE YEAR ENDED — DECEMBER 31, 19 — IF NOT FOR CALENDAR YEAR, INDICATE PERIOD COVERED

SECTION 1 - GENERAL INFORMATION

1. NAME AND ADDRESS OF MARKET AGENCY

TELEPHONE NO. *(Include area code)*

2. NAME OF DEALER ORGANIZATION *(If different from market agency)*

3. TYPE OF ORGANIZATION *("x" one)*
   a. ☐ Individual b. ☐ Partnership c. ☐ Corporation d. ☐ Association

4. DID ANY CHANGE IN ORGANIZATION TAKE PLACE DURING THE YEAR?
   a. ☐ Yes *(If "yes", give details)*
   b. ☐ No

5. IS STOCKYARD LEASED?
   a. ☐ Yes *(If "yes", give name and address of lessor)*
   b. ☐ No

6. OWNERS, PARTNERS, OR OFFICERS AND DIRECTORS

Name	Title	Duties	% of Ownership

7. DID ANY PERSON(S) REGULARLY PURCHASING LIVESTOCK FROM YOUR FIRM DURING THE PERIOD COVERED BY THIS REPORT OWN AN INTEREST IN YOUR BUSINESS?
   a. ☐ Yes *(If "yes", list names and extent of such ownership)*
   b. ☐ No

8. DOES ANY OWNER, OFFICER, DIRECTOR, STOCKHOLDER, OR EMPLOYEE OF YOUR FIRM OWN AN INTEREST IN ANY OTHER MARKET AGENCY, DEALER ORGANIZATION, STOCKYARDS COMPANY, OR PACKING COMPANY?
   a. ☐ Yes *(If "yes", give name of person, firm, and extent of ownership)*
   b. ☐ No

SECTION 2 - BOND INFORMATION

1. Number of public sale days covered by this report .....
2. Gross value of livestock sold on commission ..... $
3. Total cost of livestock purchased on commission ..... $
4. Total cost of livestock purchased on a dealer basis ..... $ $

SECTION 3 - ANALYSIS OF CUSTODIAL BANK ACCOUNT FOR SHIPPERS' PROCEEDS

1.	Balance as per bank statement	$	
2.	Deposits in transit *(In mail or bank, but not on statement)*		
3.	Certificates of deposit designated as custodial funds and purchased from bank carrying custodial account		
4.	Saving account balance designated as custodial funds deposited in bank carrying custodial account		
5.	Proceeds on hand		
6.	Proceeds receivable		
7.	**Total Debits**		$
8.	Outstanding checks and drafts which have not cleared bank	$	
9.	Proceeds due consignors of livestock for which no checks were issued		
10.	Expense items incident to sales remaining in account		
11.	**Total Credits**		$
12.	**Overage** *(Explain) (Carry to Section 4, item A1c)*		$
13.	**Shortage** *(Explain) (Carry to Section 4, item F2)*		$

**NOTE: A copy of financial statements or audit report, if available for period covered by this report, may be furnished in lieu of the Balance Sheet and Profit and Loss information; PROVIDED, information requested herein but not shown in such statements or reports is furnished.*

SECTION 4 - BALANCE SHEET AS OF CLOSE OF REPORTING PERIOD

		ASSETS	
A.	**CURRENT ASSETS**		
1.	Cash		
a.	On hand	$	
b.	General bank account		
c.	Overage in analysis of custodial bank account *(From Sec. 3, item 12)*		
2.	Inventories		
a.	Livestock		
b.	Feed		
c.	Other *(specify)*		
3.	Marketable Securities: *U.S. Government Bonds and others*		
4.	Accounts Receivable		
a.	One year old or less		
(1)	Due from trade		
(2)	Due from affiliates and subsidiaries		
(3)	Due from officers		
(4)	Due from employees		
(5)	Due from others		
b.	Subtotal *(1 thru 5)*		
c.	More than one year old		
d.	Subtotal *(b and c)*		
e.	Less allowance for doubtful accounts	( )	
5.	Notes receivable due within one year *(Including current portion, due within one year, of long-term notes)*		
6.	Other current assets		
a.	Prepaid expenses		
b.	Interest receivable		
c.	Other *(specify)*		
7.	**Total current assets**		$
B.	**INVESTMENTS**		
1.	Farms and real estate	$	
2.	Stocks and bonds *(Cost or market value, whichever is lower)*		
3.	Other		
4.	**Total investments**		
C.	**FIXED ASSETS**		
1.	Land	$	
2.	Buildings, structures, and equipment	$	
3.	Less allowance for depreciation	( )	
4.	**Total fixed assets**		
D.	**OTHER ASSETS**		
1.	Long-term notes receivable *(Not due within one year) (Excluding portion included in A5 above)*	$	
2.	Other		
3.	**Total other assets**		
E.	**TOTAL ASSETS**		$

SECTION 4 - BALANCE SHEET *(Continued)*

LIABILITIES AND NET WORTH

F. CURRENT LIABILITIES

1. Bank overdraft *(Per books)* ..... $_____
2. Shortage in analysis of custodial bank account *(From Section 3, item 13)* ..... _____
3. Payables, accruals, and other current liabilities
   a. Due to trade ..... $_____
   b. Due to suppliers ..... _____
   c. Due to affiliates and subsidiaries ..... _____
   d. Due to officers ..... _____
   e. Due to employees ..... _____
   f. Advances and deposits on livestock ..... _____
   g. Taxes ..... _____
   h. Demand notes payable ..... _____
   i. Notes, mortgages, and bonds due within one year *(Including payments on long-term debts due within one year)* ..... _____
   j. Other ..... _____ _____
4. Total current liabilities ..... $_____

G. LONG-TERM LIABILITIES

1. Notes, mortgages, and bonds payable *(Excluding payments due within one year, included in item 3i above)* ..... $_____
2. Less sinking fund ..... _____ $_____
3. Other ..... _____
4. Total long-term liabilities ..... _____

H. TOTAL LIABILITIES ..... $_____

I. NET WORTH

1. If incorporated
   a. Capital stock - *Preferred* ..... $_____
   b. Capital stock - *Common* ..... _____
   c. Paid-in capital ..... _____
   d. Retained earnings ..... _____
2. If unincorporated
   a. Owners' capital ..... _____
   b. Undivided profits (+) or loss (-) ..... _____
3. Total net worth ..... _____

J. TOTAL LIABILITIES AND NET WORTH ..... $_____

SECTION 5 - VOLUME OF LIVESTOCK HANDLED DURING YEAR

	NUMBER OF HEAD				
	Cattle	Calves	Hogs	Sheep - Goats	Horses - Mules
1. Livestock consigned by others to your firm for sale during year					
2. Livestock consigned by you to your firm					
3. Total of Items 1 and 2					
4. Livestock bought by you on an agency basis out of consignments to your firm					
5. Livestock bought on an agency basis at other than your own firm					

SECTION 6 - INCOME STATEMENT FOR ALL OPERATIONS

A. INCOME		
1. Selling Commissions	$ 201,607.34	
2. Yardage	46,006.85	
3. Buying Commissions	11,857.83	
4. Gross profit (+) or loss (-) from market support account *(From Section 7)*	-3,316.59	
5. Gross profit (+) or loss (-) from dealer operations *(From Section 8)*	8,465.39	
6. Gross profit (+) or loss (-) from feed account	-2,492.58	
7. Other income *(specify)* _____		
	24,099.25	
8. **Total income**	245,135.62	
B. EXPENSES		
1. Wages & bonuses	93,237.29	
2. Insurance	12,653.42	
3. Utilities	8,488.75	
4. Taxes	7,871.56	
5. Rent	16,063.97	
6. Depreciation	18,468.29	
7. Travel and entertainment *(including auto expenses)*	8,350.95	
8. Repairs and maintenance	10,025.14	
9. Interest	21,786.44	
10. Advertising	8,941.15	
11. Bad debts	10,882.41	
12. Trucking and hauling	9,026.79	
13. Other operating expenses _____		
	45,550.07	
14. **Total expenses**	$ 231,342.84	
C. NET INCOME (+) OR LOSS (-)		$ 13,794.91

SECTION 7 - MARKET SUPPORT ACCOUNT *(Livestock purchased from consignments to support the market)*

	NUMBER OF HEAD				
	Cattle	Calves	Hogs	Sheep - Goats	Horses - Mules
A. LIVESTOCK PURCHASED FROM CONSIGNMENTS	2,276.67	990.80	697.50	791.33	0.0

1. Gross Profit (+) or Loss *(All species) (Carry to Section 6, item A4)* $ -3,316.59

SECTION 8 - DEALER OPERATIONS

	NUMBER OF HEAD				
	Cattle	Calves	Hogs	Sheep - Goats	Horses - Mules
A. DETAIL OF DEALER OPERATIONS	60.25	0.0	6,799.0	0.0	149.0

1. Gross Profit (+) or Loss *(All species) (Carry to Section 6, item A5)* $ 8,465.39

APPENDIX C

SUMMARY INFORMATION FOR ALL LOCAL

OKLAHOMA AUCTION MARKETS

TABLE XVII

SUMMARY OF LABOR AND SALARY EXPENSES AS A PERCENTAGE OF TOTAL EXPENSES FOR 17 LOCAL OKLAHOMA LIVESTOCK AUCTION MARKETS

Labor and Salary Expenses	Rank[1]	Average Percent Devoted to Function	Response Range (Percent)
Handling Livestock	1	50.17	5.0-90.0
Management	2	12.63	1.0-26.0
Clerical Accounting	3	12.50	1.0-24.0
The Auctioneer	4	8.23	2.0-20.0
Veterinary	5	6.30	0.0-20.0
Accountant	6	4.87	0.0-20.0
Weighing Livestock	7	4.83	1.0-17.0
Other	8	.43	2.5- 4.0

[1]Rankings are most important to least important based on average response for each size group.

Source: 1983 Survey Data, Appendix A, Question 4.

TABLE XVIII

NUMBER OF ANIMAL UNITS HANDLED THROUGH MARKET SUPPORT ACTIVITY BY LOCAL OKLAHOMA LIVESTOCK AUCTION MARKETS BY SIZE GROUP

Size Group (Volume Range)	Mean	Standard Deviation	Range
Small (1-35,000)	1632.55	3190.33	18.50-11,665.50
Medium (35,001-70,000)	2336.65	3005.67	4.0 - 8,851.50
Large (70,001-171,000)	4066.80	3379.78	146.0 - 8,631.0
Total	2405.64	3186.53	4.0 -11,666.0

Source: 1983 Survey Data, Appendix B, Section 7.

TABLE XIX

NUMBER OF ANIMAL UNITS HANDLED THROUGH DEALER OPERATIONS BY LOCAL OKLAHOMA LIVESTOCK AUCTION MARKETS BY SIZE GROUP

Size Group (Volume Range)	Mean	Standard Deviation	Range
Small (1-35,000)	318.88	484.48	15.0-1036.50
Medium (35,001-70,000)	3961.75	302.29	3748.0-4175.50
Large (70,001-171,000)	2729.50	4461.79	2.0-7879.0
Total	1931.94	2765.12	2.0-7879.0

Source: 1983 Survey Data, Appendix B, Section 8.

APPENDIX D

SUMMARY INFORMATION FOR THREE TERMINAL OKLAHOMA AUCTION MARKETS

TABLE XX

SUMMARY OF LABOR AND SALARY EXPENSES AS A PERCENTAGE OF TOTAL EXPENSES FOR 3 TERMINAL OKLAHOMA LIVESTOCK AUCTION MARKETS

Labor and Salary Expenses	Rank[1]	Average Percent Devoted to Function	Response Range (percent)
Handling Livestock	1	50.33	23.0-70.0
Other	2	15.67	1.0-46.0
Management	3	9.67	7.0-12.0
Clerical Accounting	4	7.67	5.0-11.0
Veterinary	5	6.67	1.0-17.0
The Auctioneer	6	4.67	2.0- 8.0
Weighing Livestock	7	3.33	2.0- 5.0
Accountant	8	2.0	1.0- 5.0
Total		100.01	

[1]Rankings are most important to least important based on average response for each size group.

Source: 1983 Survey Data, Appendix A, Question 4.

TABLE XXI

SUMMARY RANKINGS OF POTENTIAL AREAS OF CONCERN FOR 3 TERMINAL OKLAHOMA LIVESTOCK AUCTION MARKETS

Area of Concern	Rank for Terminal Auction Markets[1]	Average Response[2]
Declining Number of Buyers	9	1.0
Declining Livestock Volume	6	1.67
High Costs of Record Keeping	2	2.33
High Labor Costs	2	2.33
Availability of Labor	6	1.67
Slow Payment by Buyers	9	1.0
Buyer Default	8	1.33
Undeclared Livestock Liens	5	2.0
Credit Availability	8	1.33
Facility Maintenance	2	2.33
P & S Regulations	9	1.0
Animal Health Regulations	1	2.67

[1]Rankings are most important to least important based on average response.

[2]Response Range: 1 = No Problem, 2 = Minor Problem, 3 = Major Problem, 4 = Critical Problem.

Source: 1983 Survey Data, Appendix A, Question 5.

VITA

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Master of Science

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