AN ANALYSIS OF COTTON MARKETING STRATEGIES

By

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CHAPTER I

INTRODUCTION

Cotton has been and is today a very important crop in the United States. Like all agricultural production, it has had many highs and lows. The cotton industry has also seen many changes over the years. The first change was the invention of the cotton gin by Eli Whitney. The invention of the gin greatly improved the efficiency and quality of the cotton fiber used in making yarn. By increasing the efficiency the cost of ginning dropped, and by increasing the fiber quality, the prices received for the fiber increased. Other important changes that have occurred in the cotton industry include production mechanization, more efficient transportation, and market improvements.

Cotton marketing has also seen many changes. The marketing of cotton has gone from selling in the local market to computerized trading networks connecting traders from around the world. The actual high and low cotton prices over the past 160 years are presented in Figure 1. The price of cotton is very sensitive to changes in the market. The all time average price high of $1.90 per pound occurred during the 1864 - 65 crop year. This high price level was due to the Civil War.

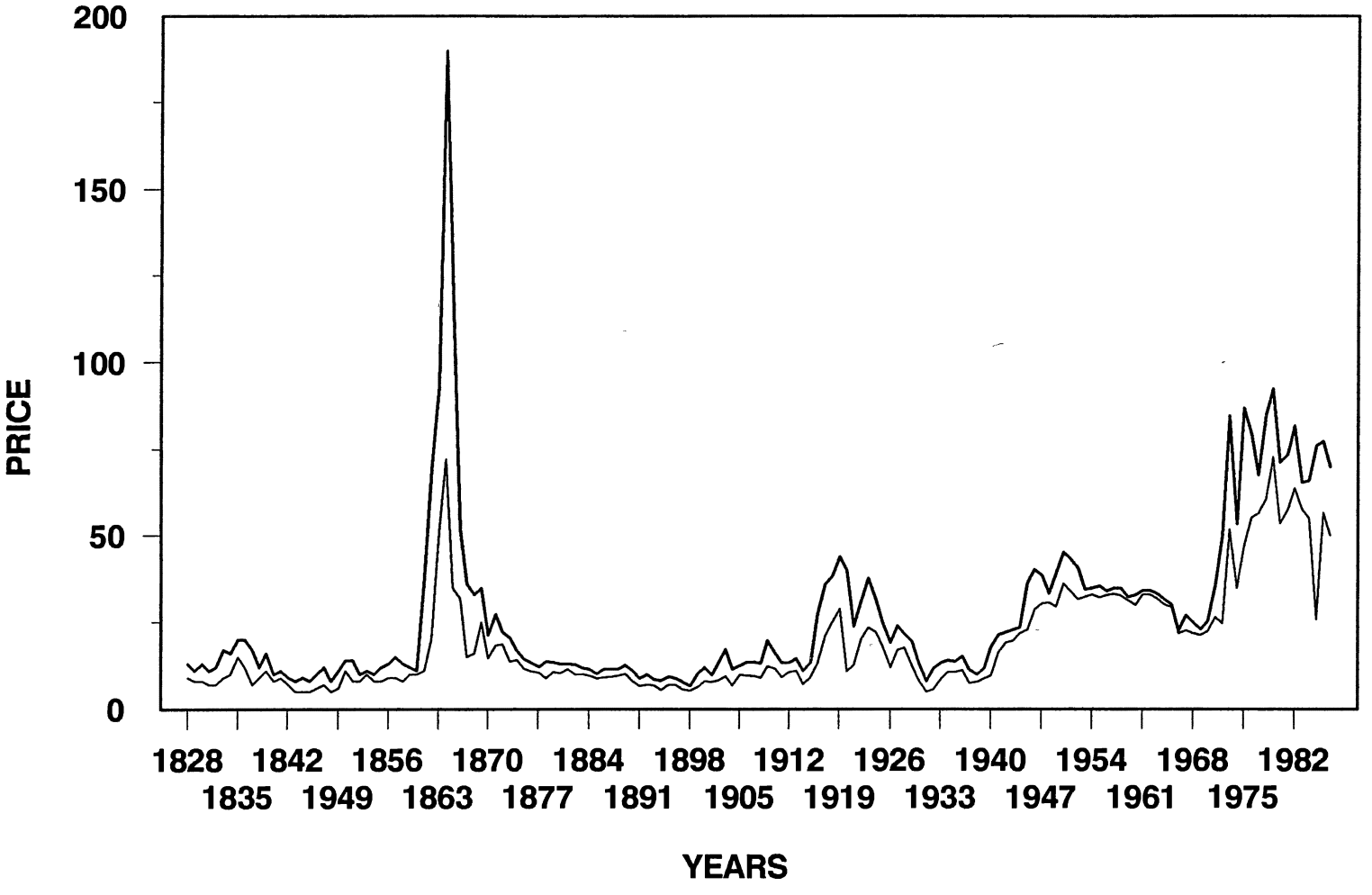

Figure 1. 160 Year High and Low Price

One of the main reasons for price highs and lows are production levels. Figure 2 shows production levels for the same 160 year period. In 1864 when the price level was the highest the production level was at an all time low of 299,000 bales.

With such large levels of price variability, cotton producers must have a good understanding of the current market situation to do an effective job of marketing the cotton crop. This study deals with current cotton marketing alternatives available to cotton production managers.

Problem Statement

A marketing problem today is that most cotton producers do not understand marketing techniques used in the market place. Many marketing tools are relatively new to most producers. The producers that are aware of current marketing tools, have difficulty in using the tools. Most of todays cotton producers desire to implement the alternatives available, but find it difficult to access reliable and dependable information on a regular basis.

Objectives

The general objective of this study is to conduct an analysis of selected marketing strategies, and improve effectiveness in the area of cotton marketing. The specific objectives are:

1. Compare selected marketing alternatives.

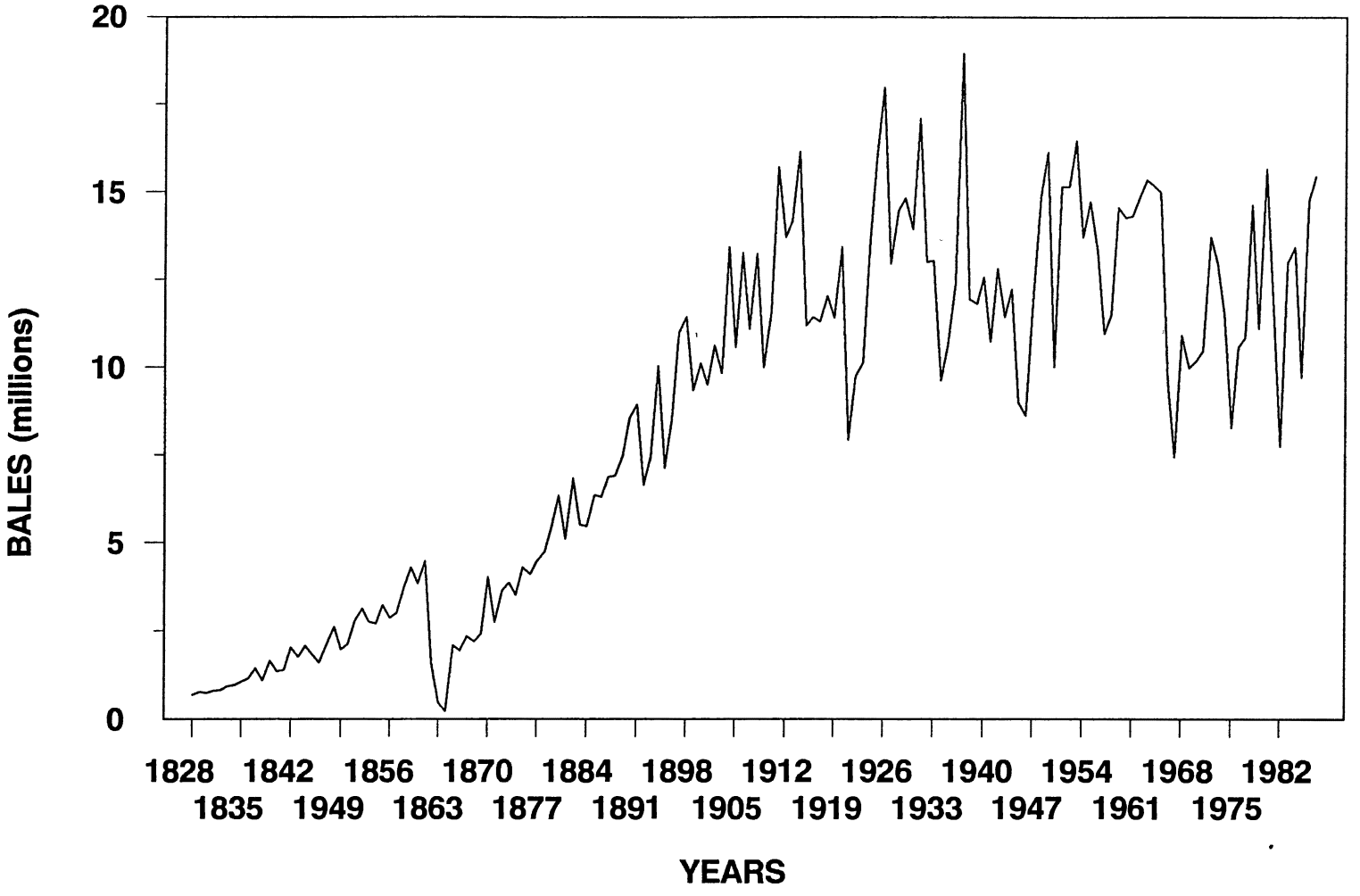

Figure 2. 160 Year Production

2. Analyze cash strategies.
3. Calculate average basis.
4. Analyze the impacts of cotton marketing loans on basis.

One objective is the analysis of selected marketing alternatives to determine which alternative produces the best results in increasing the net price received by cotton producers. Strategies that will be evaluated include: the cash market, the use of futures contracts, and the basic components necessary to use futures contracts. For the cash analysis, two methods are evaluated. The first is the use of a perfect price prediction to enable producers to sell at the highest price during the marketing year. The second cash approach involves calculating the average actual and net price on the first business day after the 1st and 15th of each month for the past seventeen years. For the analysis of the use of futures contracts, the average basis for the past seventeen years and the past one year are calculated. The basis values are then used in the explanation of hedging strategies. A harvest hedge and a storage hedge are explained along with the effects of a strengthening and a weakening basis.

The final part of the analysis is a regression model that calculates past basis levels. The regression model is estimated to measure the impact of seasonality and two marketing loan periods on the basis level. The results will be evaluated to determine the effectiveness of each

strategy, and which strategy or strategies provided the best performance in increasing the effectiveness of marketing.

CHAPTER II

LITERATURE REVIEW

It is important for producers of agricultural commodities to use price management tools. This is especially true for cotton producers. There are several marketing alternatives producers may use to manage price. These include forward contracting, the use of hedging on futures markets, futures options and combinations of all three along with the cash market. During the past few years numerous studies have been conducted on the use and performance of the various strategies listed to determine there usefulness in reducing price risk and enhancing income level. A discussion of previous studies provides insight into the nature of the techniques available to producers. In the following section, previous studies performed on marketing alternatives of cotton will be discussed.

Shafer, Anderson and Hundl Jr. (1989) examined cotton behavior for Memphis, Dallas and Lubbock. Basis behavior was broken down into several points; nearby, just prior to the first notice day, and between the first notice day and the final trading day. The futures contracts used were October, December and March. Means, standard deviations

and ranges were calculated to examine the consistency of basis behavior.

It was observed that Memphis had the strongest basis mean in all periods and Lubbock had the weakest. In the nearby period, while Memphis had the strongest basis both the Dallas and Lubbock bases strengthened over the period. Both Dallas and Lubbock were stronger on the first notice day and last trading day than in the nearby period. The study concluded that basis behavior is season, location and contract specific, which would make it difficult to determine the proper time to lift a hedge.

A study by C.E. Shafer and C.G. Anderson (1990) focused on hedging ratios. The study calculated hedge ratios for short hedges. A hedge ratio was defined as the amount of futures needed per unit of cotton hedged. A ratio of one or greater means a stronger basis as price increases and a ratio of less than one means a weaker basis as price increases. It was found that hedge ratios were one or greater during harvest months and less than one during the storage months. It was concluded that during the harvest months, the cash and futures markets moved together, and during the storage months the markets were more variable. Another finding was that with hedge ratios of less than one producers would be better off to under hedge their production due to the weak basis.

Robert S. Firch and Ghazi Al-Sakkaf (1986) conducted a study on cotton options as low price insurance. The option

months considered were December and March. Through their research on options they found that at-the-money put options had the greatest time value. The strategies evaluated were cash, forward contract sale, hedging short futures and put option hedging. Average net income of each strategy was computed to compare the strategies. The results showed that cash had a higher return than the forward contract and the short futures, but options one cent out-of-the-money, at-the-money and five cents in-the-money had a higher return than cash. As low price insurance it was concluded by the authors that when the futures price is low and does not move much options do not perform well.

In 1990, Wendel Wood analyzed four different marketing strategies to find out which performed best in reducing price risk. The four strategies were long put, short call, fence or window, and minimum price contract. Each of the four strategies was compared against the cash sale. December and March options were used for puts at-the-money and one cent out-of-the-money, and for calls two and four cents out-of-the-money. The long put option was higher than the cash sale on average in both months and with both strike prices. For the short call options, the results were only slightly higher average returns than the cash sale. Minimum price contracts, which consist of a forward contract with a long call, did not perform as well as the long put or short call. At times the average was higher than cash and at other times it was lower.

The window strategy for the December and March options provided average prices higher than the cash sale. The authors concluded that the long put strategy allows the most flexibility, and that the window strategy provides more options to meet individual needs. It was also noted that in a downward trending market, long puts and windows fared the best, and short calls and minimum price contracts did not perform well.

A 1986 study on cotton option hedges by Steven J. Torok and William E. Beach compared different option hedges for December options ranging from five cents out-of-the-money to seven cents in-the-money during the three month time period from April to June 1985. For this study, only put options were evaluated. Each option was held until expiration and then exercised. To compare each option, the mean net revenue and standard deviation were calculated. Options with the highest mean and lowest standard deviation were the ones that preformed the best.

After completing the analysis and comparing the results, it was found that the five and four cent out-of-the-money puts had the lowest mean net revenue, with the exception of the seven cent in-the-money put, and the lowest of all the standard deviations. All other puts had approximately the same mean net revenue and standard deviation. Which put option to use was based on the risk preference and return level of the individual producer. The lower the standard deviation, the less the risk, and the

higher the mean net revenue, the greater the return.

Lawrence A. Lippke and Thomas L. Sporleder (1986) performed a study on the performance of short hedging and cotton options. For the analysis, a whole farm simulation was conducted. The strategies used were selling cash, short futures, buying puts at-the-money, writing calls at-the-money, buying puts at cost of production and writing calls at cost of production. Each strategy was evaluated under low and high debt, and low and high yield variability. To compare the different strategies, the net returns were calculated for each strategy.

The results showed that with low debt, the best alternative was to buy puts at-the-money. Cash was the next best strategy. The worst return was writing at-the-money calls or calls at cost of production. It was also noted that yield variability had little effect.

For high debt, puts at-the-money with the use of a delta provided the best return. With high debt and yield variability it was found that returns from puts at-the-money, short futures, and calls at cost of production all had about the same returns. Based on the findings of this study, the authors concluded that in the Texas southern high plains, puts at-the-money were the better strategy for marketing cotton.

Government Programs

The beginning of the 1970's saw several changes in the

direction and implementation of government programs for cotton. Just prior to the seventies, the government program for all crops began to shift more toward a market orientation of price supports and acreage reduction to control supply. The following explanation of government programs is a summary from, The Background for 1990 Farm Legislation by Harold Stults, Edward H. Glade Jr., Scott Sanford and Leslie A. Meyer.

In 1970, the three year elimination of cotton marketing quotas set up a voluntary program for cotton. Since 1934, with the exception of World War II and the Korean War, marketing quotas had been in effect. The use of marketing quotas was to ensure that producers not participating in acreage reduction programs were unable to receive the benefits of the program. After elimination of marketing quotas, government payments were only made on allotted acres.

The Agricultural Act of 1970 also implemented a set-aside program where producers were paid to "set-aside" up to 28 percent of their farm base acreage to conserving uses. The act also set a 55,000 dollar annual limit on government payments. This limit did not apply to Commodity Credit Corporation loans or purchases.

The Agricultural and Consumer Protection Act of 1973 established the use of a target price to provide income enhancement. The target price offered a way to provide income security to producers, through the use of a direct

payment, that did not affect the market price. This was accomplished by paying the difference between the market price and target price if the market price is below the target price. In the event the market price is below the loan rate the payment is the difference between the target price and the loan rate. Other changes in the seventy-three act included the introduction of disaster payments and the lowering of payment limits to 20,000 dollars per person.

In 1977, in response to falling farm income, the target price calculation was changed. It is now based on a cost of production basis, instead of being based on an index of farm input prices. The 1977 act also changed the target price payment to actual planted acreage instead of an historical allotment.

Due to a lag in the cost of production formula for target prices, the Agriculture and Food Act of 1981 set up minimum target price levels for the next four years. Crop acres to be used in basing acreage reduction programs were set up in the 1981 Act. The 1981 Act also raised the minimum loan rate to 55 cents per pound from the previous level of 48 cents per pound. As in past legislation, land taken out of production through set-aside had to be used in conservation uses. The payment limit was increased to 50,000 dollars per person; however, this limit did not apply to disaster payments which could not exceed one hundred thousand dollars.

In an effort to reduce cotton stocks and achieve higher

reductions in acreage, the Payment-in-kind program was introduced in 1983. The PIK program paid producers with surplus cotton from commodity credit corporation stocks for reducing their cotton acreage. The PIK program was in addition to the existing reduction programs in effect in 1983.

The Food Security Act of 1985 had one major change. In an effort to make the United States more competitive in the world market, a marketing loan was implemented. The marketing loan allowed for repayment of cotton loans at a price below the loan rate. Other changes in the 1985 Act included reducing target prices and setting a new minimum loan rate at fifty cents per pound.

The Food, Agricultural, Conservation, and Trade Act of 1990 provided for the continuation of the 1985 Act. The Omnibus Budget Reconciliation Act of 1990 amended the 1990 Food, Agricultural, Conservation, and Trade Act by adding Flexible acreage. Flexible acreage allowed producers to "flex" up to 25 percent of a program crops base acreage to another crop and still be eligible for program benefits.

Cotton Grades and Grading

In the past cotton was graded by hand, thus some aspects of cotton grades were subject to individual interpretation. Today cotton is graded mechanically by a system known as High Volume Instrument (HVI). The HVI system eliminated individual subjectivity and a more

accurate and consistent grading of cotton has been introduced. In this section both manual and HVI grading will be discussed, and a description of the grades will be provided.

The grading process starts by obtaining a representative sample from each bale of cotton. Samples are taken by hand, which involves physically cutting the sample from each side of a bale. In newer gins, a machine is used to automatically sample each bale. Half of the sample is sent to the United States Department of Agriculture (U.S.D.A.) classing office with the gin and bale number information attached and half remains with the bale.

At the classing office, the sample is tested for moisture content. For grading and classing, the sample moisture level should be approximately seven percent. To get seven percent moisture, the sample is placed in a room kept at a constant temperature of 70 degrees Fahrenheit and a constant humidity of 65 percent.

The process of manually grading cotton requires a grader to physically inspect the sample for color, trash, preparation, and staple length. To assist the grader in determining color, trash and preparation the sample is compared against official measuring standards.

The manual grade has three categories: color, trash and preparation. Color is based on the chroma or saturation, the hue or name of the color, and the brightness of the fibers. Trash content is broken down into either

large leaf or pin trash sizes. Preparation is the degree of smoothness or roughness of the cotton fiber. Naps are small twisted lumps of fiber. Neps are small knots of twisted fibers, and are more objectionable than naps.

Two additional factors necessary in the grading process are micronaire and staple. Micronaire is a measure of the fineness of the fiber and has always been measured by a machine. The process involves taking a 50 gram sample, compressing it to a standard volume, and forcing a volume of air through the sample. To determine the micronaire reading, the machine measures the resistance of the air blown through the sample. Staple is the length of the cotton fiber measured in 32nds of an inch.

High Volume Instrument is an instrument measurement of color, trash, micronaire, staple, strength and uniformity. These are the same categories as the manual grading system plus categories for strength and uniformity. Color and trash content are evaluated using a video camera. Micronaire is measured the same way for both the HVI system and the manual system.

To measure staple, strength and uniformity, the HVI machine extracts a small portion of cotton from the sample. This sample portion is then mechanically combed and placed into a device which breaks the fibers and converts the force required to break the fibers into grams per tex. A tex unit is equal to the weight in grams of 1,000 meters of fiber. The HVI machine measures staple in hundredths of an inch

instead of 32nds of an inch which is used in the manual measurement.

All test results are displayed on a computer monitor. While the HVI system does test the color, trash and preparation of the sample, the grader is still required to manually grade these items and assign the appropriate grade.

The cotton grade information is printed on a class card. The class card can be read by sight or by machine. The information provided on the card includes: gin code number, gin bale number, producer account number, grade, length (in 32nds), micronaire, grade remarks, strength (in grams per tex), color, trash, length (in hundredths), uniformity and the date that the sample was graded. After the cards have been completed they are returned to the gin and are used in the sale of the cotton.

Cotton grades for upland cotton consist of: good middling, strict middling, middling, strict low middling, low middling, strict good ordinary, and good ordinary. Each grade is given a code number starting with 11 for good middling, which is the best, and going in steps of ten to 71 for good ordinary. The first digit in the code represents the leaf and preparation and the second digit represents the color of the sample. Colors range from plus; which is a color that is a grade higher than the leaf and preparation of the sample, to gray. The code numbers end in 1 for white, 0 for plus, 2 for light spot, 3 for spot, 4 for tinged, 5 for yellow spot, 6 for light gray and 7 for gray.

Grades of 81 through 85 are for below good ordinary, below strict good ordinary light spot, below strict good ordinary spot, below low middling tinged and below middling yellow spot respectively.

Cotton staple is measured in 32nds of an inch increments ranging from below 13/16 to 1-1/2 inches, when measured manually. The HVI measurement range is from .79 and shorter to 1.48 and longer in hundredths of an inch. Each staple length is given a code number from 24 below 13/16 to 48 for 1-1/2. The base grade and staple for marketing purposes is grade 41 staple 34; which would be a strict low middling of 1-1/16 inch staple.

CHAPTER III

MARKET STRATEGIES ANALYSIS AND RESULTS

Cotton production managers are faced with an increasing number of marketing decisions. In today's economic climate probably the most important decisions made are how and when to market the current cotton crop. In making marketing decisions managers need to consider alternate marketing strategies, costs, and the current financial position of the farm.

Several marketing strategies are available to farm managers; futures contracts, futures options, forward contracts and cash marketing. All of these strategies may provide the manager a means of marketing the cotton crop. How each strategy is implemented by the manager influences the price received for the crop. It is up to the individual manager to chose which strategy will be used. Cash marketing is the method chosen by a large portion of farm managers.

This chapter describes the analysis procedures and the results. The first part deals with the two cash marketing approaches. The last two sections deal with historical basis estimates and the use of basis in futures marketing

transactions.

Data

The data used to perform the marketing analysis are seventeen years of daily spot cash prices from August 1, 1973 to November 30, 1990 for strict low middling 1 1/16th inch cotton in both Dallas and Lubbock marketing regions. New York futures daily closing prices for all five contract months from August 1, 1973 to November 30, 1990 were also used. Storage cost are from the Oklahoma Cooperative Association Compress in Altus, Oklahoma, and interest rates are the agricultural loan rate from a commercial bank. Storage and interest rates cover the same seventeen year period as the cash prices. Storage and interest cost are known as carrying cost. To simplify the discussion, the Lubbock analysis and results are discussed in the following sections. The Dallas results are shown in an appendix.

Cash Analysis

The average net price that would have been received through the use of different cash strategies is calculated from the data. The average net price is the actual cotton price minus the storage and interest costs. Compress storage cost are applied on a per bale basis. Prior to 1988, storage costs were on a per bale per month basis. Starting in 1988, storage costs were changed to a per bale per day basis. For this analysis, all storage costs were

converted to a per pound per day basis.

Interest cost depends on what the income from the sale of the cotton will be used for. The income could be put in an interest bearing account, or used to pay an operating loan. For this analysis, the interest rate on an operating loan from a commercial bank was used in the calculation of the carrying cost.

Perfect Price Predictor

One approach to cash marketing would be to predict the highest net price during the current marketing year and sell on that day. Four time periods were selected, November 1 through October 31 the next year, December 1 through the following November 30, January 1 through December 31, and January 1 through July 31 of the same year (Table I).

These time periods were chosen to allow for the length of harvest, tax considerations and other individual differences in marketing traits. Cotton prices are provided for the beginning day of each period, the highest net price during the period and the date that the high price occurred. Average prices for the seventeen year period are also provided for each set of prices.

For the three starting dates November 1, December 1 and January 1 the average price is approximately 59 cents per pound. This means that over the past seventeen years cotton

TABLE I

LUBBOCK PERFECT PRICE

Year	Nov 1 - Oct 31			Dec 1 - Nov 30			Jan 1 - Dec 31			Jan 1 - Jul 31	
	Nov 1 Price	Sell Date	Sell Price	Dec 1 Price	Sell Date	Sell Price	Jan 1 Price	Sell Date	Sell Price	Sell Date	Sell Price
1973	56.25	1/15	72.06	64.05	1/15	72.25	71.55	1/15	72.45	1/15	72.45
1974	38.80	10/6	47.83	38.00	11/26	48.19	33.50	12/11	53.80	7/28	43.12
1975	47.50	7/6	77.15	49.00	7/6	77.34	54.00	7/6	77.54	7/6	77.54
1976	75.60	11/8	76.30	73.35	3/21	73.59	65.60	3/21	73.80	3/21	73.80
1977	45.30	10/30	60.74	45.80	11/24	61.78	46.35	11/24	62.00	6/19	54.88
1978	62.10	11/24	64.18	63.60	12/1	63.59	60.00	12/26	63.25	1/5	60.26
1979	60.10	10/27	81.78	62.60	11/20	82.84	66.60	11/20	83.14	2/14	73.92
1980	84.75	11/20	86.06	85.25	12/29	85.97	85.25	1/5	85.70	1/5	85.70
1981	59.50	7/22	60.53	52.40	7/22	60.84	54.75	7/22	61.16	7/22	61.16
1982	58.20	8/8	69.65	57.95	8/8	69.95	57.95	8/8	70.26	6/27	69.68
1983	68.20	5/10	74.76	70.95	5/10	75.06	67.95	5/10	75.37	5/10	75.37
1984	60.95	11/1	60.94	60.45	12/3	60.42	55.20	4/11	59.95	4/11	59.95
1985	55.50	6/9	63.38	56.00	6/9	63.67	56.50	6/9	63.97	6/9	63.97
1986	42.50	8/20	71.50	47.00	8/20	71.78	56.25	8/20	72.08	7/30	68.73
1987	60.00	11/25	63.76	64.00	12/1	63.99	58.50	1/7	58.92	1/7	58.92
1988	51.25	9/18	64.52	51.00	11/3	65.34	53.75	11/3	65.70	7/27	63.59
1989	66.75	8/1	73.91	63.75	8/1	74.24	63.00			7/10	73.84
Avg	58.43		68.77	59.13		68.87	59.22		68.69		66.88

production managers who sold on November 1, December 1 and January 1 would have received, on average, 59 cents per pound for their crop.

During the same three time periods the average net price that could have been received by selling on the highest day during the period would have yielded an average price of approximately 69 cents per pound. The perfect price prediction would have provided the manager an extra 10 cents per pound, on average, during the past seventeen years.

The fourth time period from January 1 to July 31 shows that a perfect price prediction during this period would have provided a slightly lower price on average. The seven month period had an average price of 66.88 cents per pound. Limiting sales to the period between January and July reduces the average net price of a perfect prediction by approximately 2 cents per pound.

Something to consider in the use of the perfect price prediction is that it is possible to have two crops sold in different crop years, but in the same tax year. For example the manager that selected the December 1 to November 30 crop year would have sold the 77 crop on November 24, 1978 and the 78 crop on December 1, 1978. This would not be a problem should the manager select the January 1 to December 31 time period as the marketing year because this time period is the same as most tax years.

The months with the largest number of perfect price

highs varied with each time period. For the November to October time period, the months with the most price highs are July with two, August and October with three each and November with five. The December to November time period had the most price highs in July with two, August with three, and November and December with four each. In the January to December period the months with the greatest number of price highs are January and November with three, July, August, and December with two.

Sell First and Fifteenth

A more realistic approach to marketing cotton would be to assume that prices can not be perfectly predicted with sufficient accuracy to improve the marketing decision. This approach calculates the average daily cotton price on the first business day after the first of each month and on the first business day after the 15th of each month for the seventeen year period (Table II). The average net price is also calculated for the same dates. As in the previous method, the analysis was started on November 1, December 1 and January 1. The difference between the actual average price line and the net average price line is approximately 0.28 cents per pound per month.

For the market year beginning on November 1 the average price shows an increase from November 1 to January 1 from 58.43 cents to 59.22 cents per pound (Figure 3). After January 1 the price falls to 58.47 cents on February 1

TABLE II

LUBBOCK ACTUAL AND NET AVERAGE CASH PRICES
NOVEMBER 1 THROUGH OCTOBER 31, 73-90

Date	Actual Price	Net Price
November 1	58.43	58.41
November 15	58.79	58.64
December 1	59.13	58.85
December 15	59.20	58.78
January 1	59.22	58.64
January 15	58.47	57.76
February 1	58.47	57.61
February 15	59.09	58.09
March 1	59.09	57.97
March 15	59.58	58.33
April 1	60.42	59.02
April 15	60.85	59.32
May 1	61.70	60.03
May 15	62.41	60.61
June 1	62.15	60.19
June 15	61.69	59.60
July 1	62.52	60.29
July 15	62.59	60.23
August 1	60.00	57.49
August 15	58.91	56.27
September 1	59.04	56.25
September 15	58.55	55.62
October 1	58.69	55.63
October 15	59.04	55.84

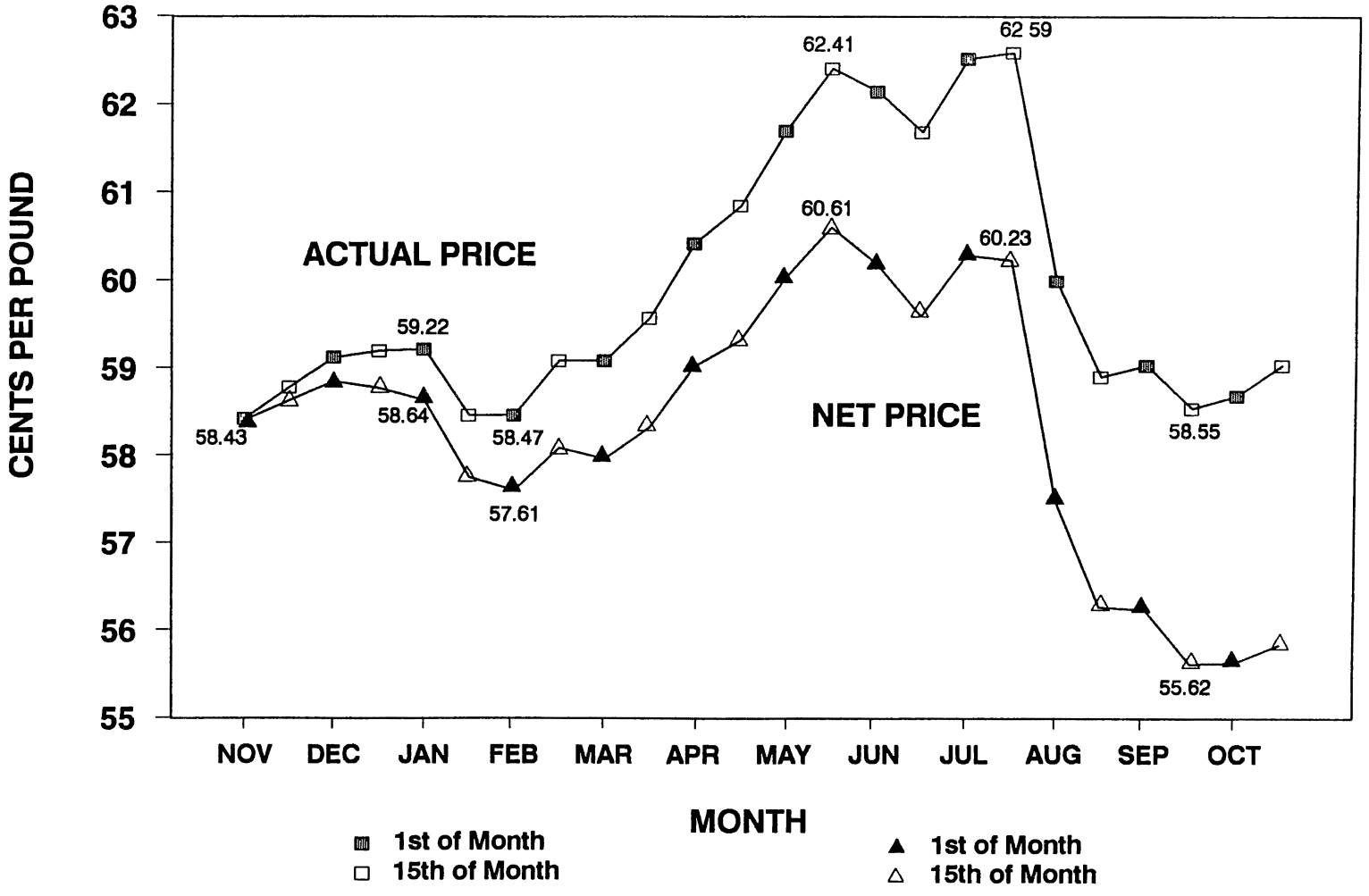

Figure 3. Lubbock Actual and Net Cotton Price August 1, 1973 through November 30, 1990

before peaking on July 15th at 62.59 cents. After reaching its peak on July 15th the price drops to 58.55 cents on September 15th.

When the net average price is calculated by subtracting the carrying cost of 0.28 cents per month from the average prices, the results change. The general trend stays the same; however, the date of the highest net price is on May 15 at 60.61 cents per pound.

For the December 1 and January 1 time periods, the average price and the net average price lines are basically the same as the time period that begins in November (Tables III and IV and Figures 4 and 5). The main difference is in the net average price line. Because of the increase in the storage time the carrying costs are greater for the November time period than for the other two time periods.

To explain the sharp price drop on August 1, the same analysis was performed omitting the period of time from August 1, 1986 to December 31, 1986 (Table V and Figure 6). The prices during this time were unusually low due to the implementation of the marketing loan on August 1, 1986. By removing those dates the results show that the average price still declines after peaking on July 1, but not as rapidly. With the prices removed, the price falls to 59.62 cents on October 1 and remains flat until December 15 when it falls to 58.77 cents. With the August through December 1986 prices included the price fell to 57.96 cents on September 15 and then gradually increased.

TABLE III

LUBBOCK ACTUAL AND NET AVERAGE CASH PRICES
DECEMBER 1 THROUGH NOVEMBER 30, 73-90

Date	Actual Price	Net Price
December 1	59.13	59.11
December 15	59.20	59.05
January 1	59.22	58.92
January 15	58.47	58.03
February 1	58.47	57.89
February 15	59.09	58.37
March 1	59.09	58.25
March 15	59.58	58.60
April 1	60.42	59.30
April 15	60.85	59.59
May 1	61.70	60.31
May 15	62.41	60.88
June 1	62.15	60.47
June 15	61.69	59.87
July 1	62.52	60.57
July 15	62.59	60.50
August 1	60.00	57.76
August 15	58.91	56.54
September 1	59.04	56.53
September 15	58.55	55.90
October 1	58.69	55.90
October 15	59.04	56.12
November 1	59.24	56.16
November 15	59.06	55.84

TABLE IV

LUBBOCK ACTUAL AND NET AVERAGE CASH PRICES
JANUARY 1 THROUGH DECEMBER 31, 74-89

Date	Actual Price	Net Price
January 1	58.98	58.96
January 15	58.31	58.16
February 1	58.23	57.94
February 15	58.70	58.27
March 1	58.77	58.22
March 15	59.13	58.45
April 1	59.96	59.13
April 15	60.42	59.46
May 1	61.28	60.18
May 15	61.93	60.69
June 1	61.42	60.05
June 15	61.36	59.85
July 1	62.02	60.38
July 15	61.75	59.97
August 1	58.94	57.01
August 15	58.22	56.16
September 1	58.31	56.11
September 15	57.96	55.62
October 1	58.23	55.76
October 15	58.48	55.88
November 1	58.56	55.81
November 15	58.56	55.67
December 1	58.82	55.80
December 15	58.58	55.43

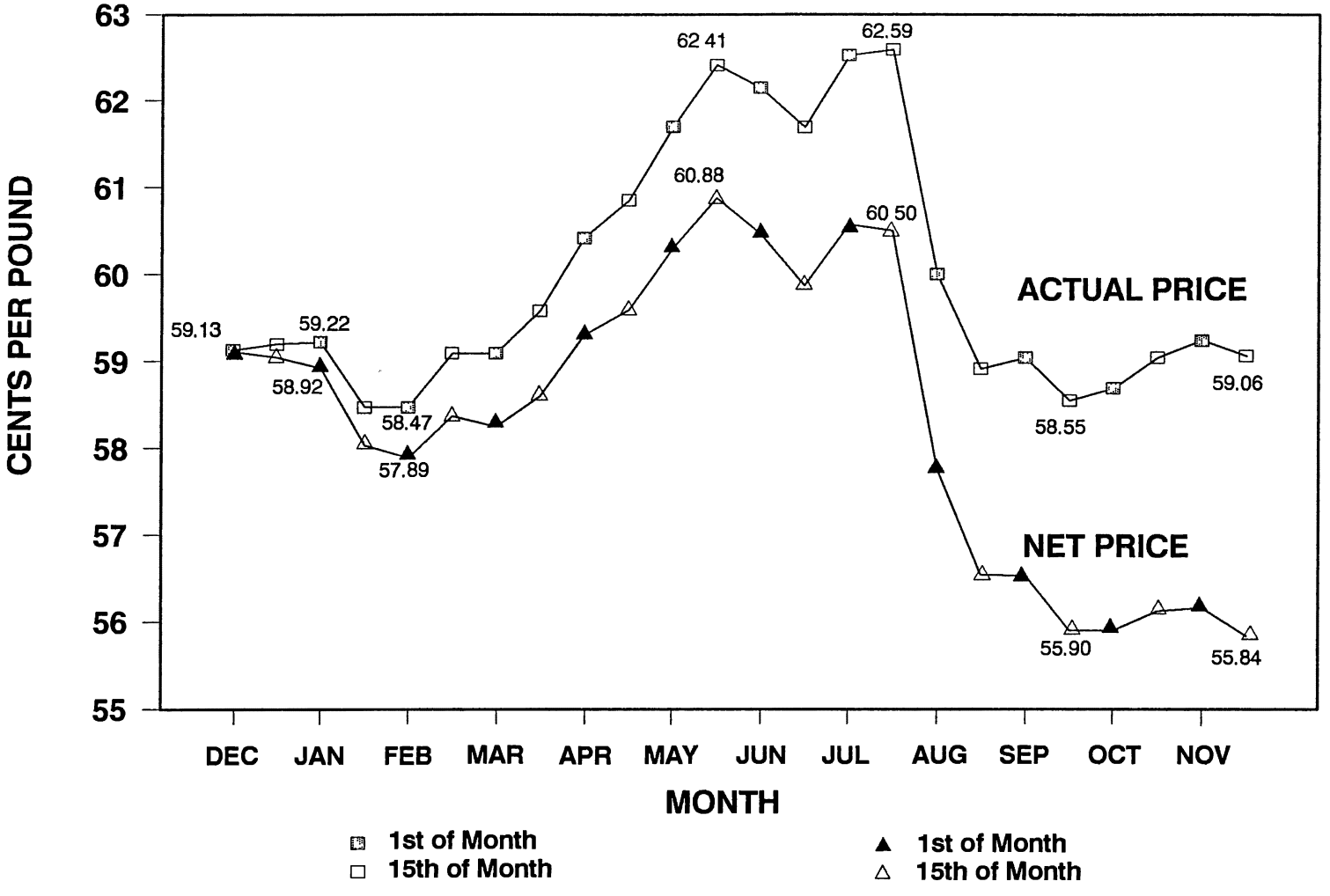

Figure 4. Lubbock Actual and Net Cotton Price August 1, 1973 through November 30, 1990

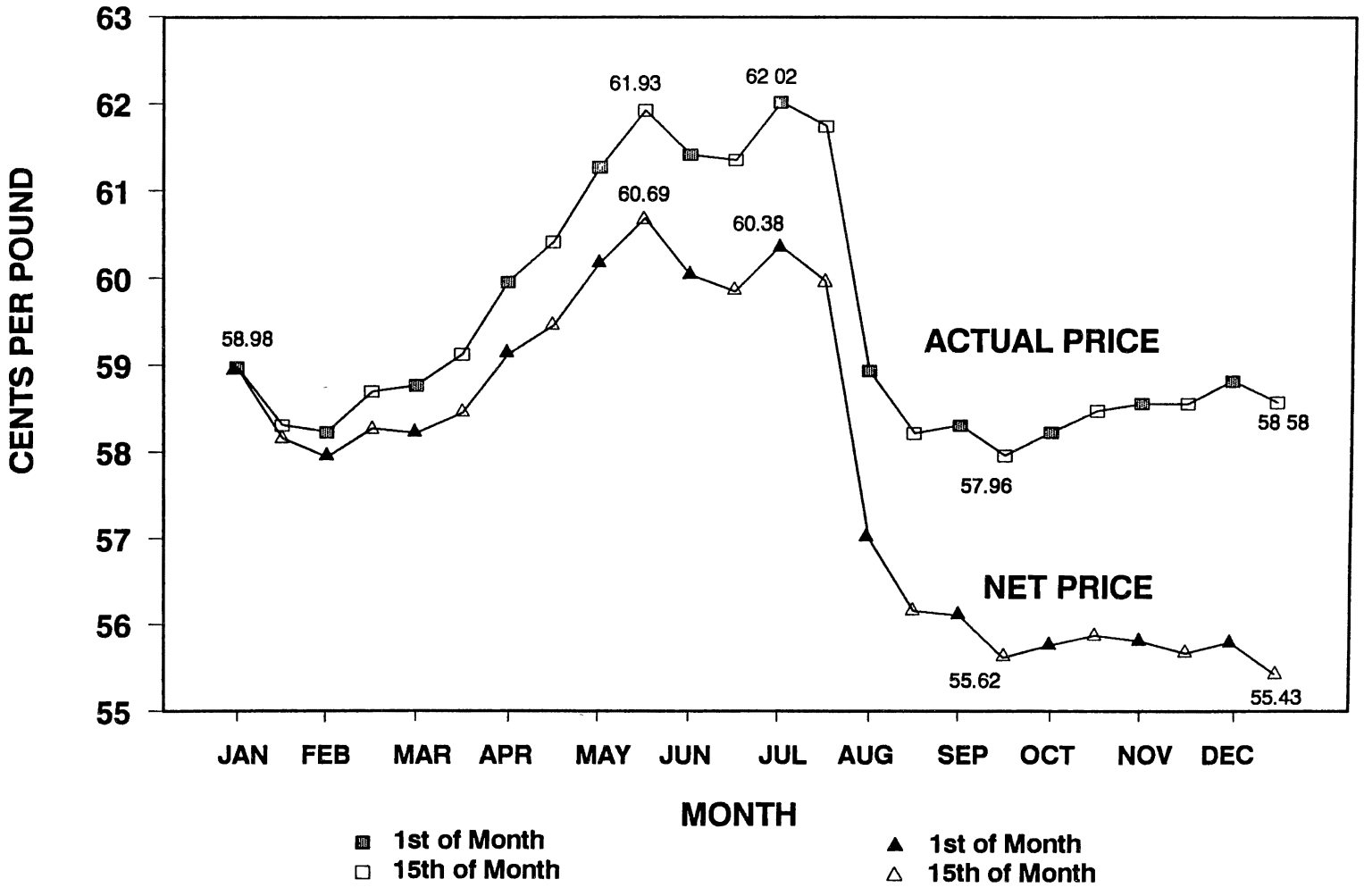

Figure 5. Lubbock Actual and Net Cotton Price August 1, 1973 through November 30, 1990

TABLE V

LUBBOCK ACTUAL AND NET AVERAGE CASH PRICES
JANUARY 1 THROUGH DECEMBER 31, 74-89
MINUS AUGUST 1 - DECEMBER 31, 86

Date	Actual Price	Net Price
January 1	58.98	58.96
January 15	58.31	58.16
February 1	58.23	57.94
February 15	58.70	58.27
March 1	58.77	58.22
March 15	59.13	58.45
April 1	59.96	59.13
April 15	60.42	59.46
May 1	61.28	60.18
May 15	61.93	60.69
June 1	61.42	60.05
June 15	61.36	59.85
July 1	62.02	60.38
July 15	61.75	59.97
August 1	61.30	59.38
August 15	60.37	58.32
September 1	60.40	58.20
September 15	59.87	57.54
October 1	59.62	57.16
October 15	59.58	56.99
November 1	59.63	56.90
November 15	59.56	56.69
December 1	59.61	56.60
December 15	58.77	55.63

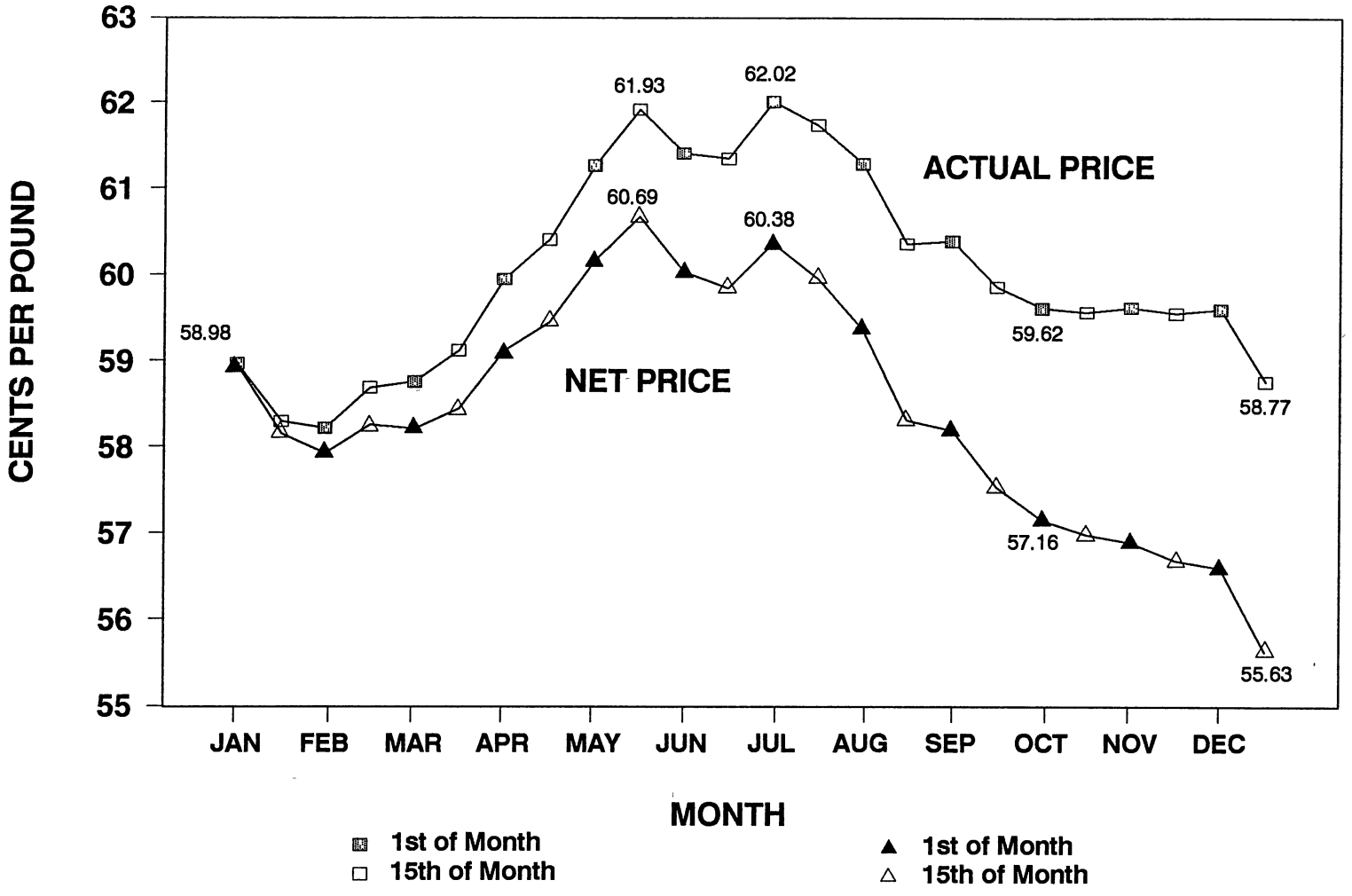

Figure 6. Lubbock Actual and Net Cotton Price August 1, 1973 through November 30, 1990 Minus August 1 through December 31, 1986

Basis Description

Futures contracts and options have an advantage over cash marketing. This advantage is that through the use of the futures strategies cotton producers can manage price risk, and assure a market price in advance of the actual selling of the cotton in the cash market. However, the exact selling price is not known with certainty due to basis risk. Basis risk is the difference between the expected basis when the futures hedge is placed and the actual basis when the hedge is lifted.

Basis is defined as the difference between the local cash price and a specified futures contract price. It is calculated by subtracting the specified futures contract price from the cash price. For cotton there are five contract months: March, May, July, October and December.

There is also a designated nearby contract which is the contract closest to the delivery month. The nearby months for each contract are: December through February for March, March and April for May, May and June for July, July through September for October and October and November for December.

Differences in location and the costs of storage and handling are the components of basis. Location is constant over the entire life of the futures contract. Location costs are linked to transportation cost of delivering the

cotton to the futures contract delivery point. Storage and handling costs diminish over the life of the contract so that on the maturity date, the only difference between the cash price and the futures price is the difference in location.

The difference in price between where the producer will sell his cotton locally and the Lubbock market price is known as the local margin. When the local margin is subtracted from the Lubbock basis the result is the local basis. This process is known as localizing the basis.

Basis can strengthen and weaken. A strengthening basis is one that becomes more positive than average over time and a weakening basis is one that becomes more negative than average over time. When the basis strengthens during the contract period, the net price received from a short hedge increases and when the basis weakens the net price received for a short hedge decreases.

Good basis estimates are important in making marketing decisions. One approach is to use historical data to calculate basis estimates. To analyze the cotton basis for the Dallas and Lubbock marketing regions two methods were used. The first is a simple average method and the second is a regression model.

Basis Analysis

To calculate the simple average basis, the futures prices for each contract month were set up so one contract

year did not overlap into another year. The futures prices and the cash prices were then combined by contract month. The basis for each contract was calculated by taking the cash price minus the futures price. After calculating the basis, the average basis was calculated by averaging the basis data for each contract by month.

A sixteen year and a one year average were calculated (Tables VI and VII). The standard deviations of the sixteen and one year average basis tables are provided in Tables VIII and IX. The sixteen year basis provides a historic pattern that can be compared to shorter time periods. By comparing the sixteen year and the one year averages, it is possible to detect strength and weakness in the current one year basis. The standard deviations show how much variation can be expected from the average basis estimates.

In calculating the expected price that a short hedge position will provide, the sixteen year average basis table may be the preferred choice due to the large amount of data. The one year average basis table may be used as a comparison with the sixteen year average basis.

Correct interpretation and use of the basis tables is essential in the efficient use of the futures marketing strategies. To use the information in the basis tables, cotton producers need to understand a futures hedge. There are two kinds of hedge, a short hedge and a long hedge. Short hedges are placed when a person has physical

TABLE VI

AVERAGE MONTHLY COTTON BASIS FOR LUBBOCK
JUNE 1974 - MAY 1990

Month	Contract Month Mar	May	Jul	Oct	Dec
	(Cents per Pound)				
Jan	-7.20	-8.10	-8.51	-6.33	-5.46
Feb	-6.79	-7.66	-8.10	-5.70	-4.99
Mar	-7.15	-7.17	-7.50	-4.75	-4.12
Apr	-3.90	-6.37	-6.54	-3.54	-2.91
May	-3.98	-6.69	-6.69	-3.80	-3.08
Jun	-4.04	-4.59	-6.42	-3.60	-3.15
Jul	-4.24	-4.78	-7.13	-3.61	-3.35
Aug	-7.26	-7.95	-8.43	-5.78	-6.11
Sep	-7.52	-8.34	-8.76	-5.59	-6.22
Oct	-7.48	-8.24	-8.49	-6.01	-6.26
Nov	-7.03	-7.89	-8.19	-5.82	-5.57
Dec	-6.59	-7.42	-7.76	-5.58	-4.87

TABLE VII

AVERAGE MONTHLY COTTON BASIS FOR LUBBOCK
JUNE 1989 - MAY 1990

Month	Contract Month Mar	May	Jul	Oct	Dec
	(Cents per Pound)				
Jan	-4.84	-5.86	-6.01	-3.71	-2.42
Feb	-4.13	-5.59	-5.84	-2.67	-1.36
Mar	-4.58	-4.95	-5.31	-0.28	1.16
Apr	1.49	-5.81	-5.50	0.21	2.32
May	0.88	-5.76	-6.98	-1.19	1.71
Jun	-7.85	-8.33	-5.19	-6.91	-7.03
Jul	-9.96	-10.26	-4.53	-8.64	-9.33
Aug	-9.96	-10.35	-10.16	-8.31	-9.12
Sep	-8.06	-8.86	-8.95	-6.61	-7.08
Oct	-8.76	-9.41	-9.35	-8.43	-7.45
Nov	-7.28	-8.05	-7.99	-2.03	-5.04
Dec	-5.79	-6.55	-6.46	-2.67	-2.83

TABLE VIII

STANDARD DEVIATIONS OF MONTHLY
COTTON BASIS FOR LUBBOCK
JUNE 1974 - MAY 1990

Month	Contract Month Mar	May	Jul	Oct	Dec
	(Cents per Pound)				
Jan	2.49	2.92	3.56	5.22	5.77
Feb	3.12	3.34	3.82	6.21	6.50
Mar	2.86	3.09	3.07	7.13	7.39
Apr	8.59	2.71	2.61	8.36	8.48
May	8.56	2.28	1.97	8.32	8.49
Jun	9.57	9.54	2.71	9.56	9.53
Jul	10.19	10.21	3.37	10.23	10.11
Aug	3.69	3.82	4.03	3.42	3.55
Sep	2.84	2.91	3.14	2.78	2.84
Oct	2.31	2.41	2.69	2.04	2.12
Nov	2.24	2.53	2.96	4.66	1.93
Dec	2.39	2.69	3.15	4.66	1.76

TABLE IX

STANDARD DEVIATION OF MONTHLY
COTTON BASIS FOR LUBBOCK
JUNE 1989 - MAY 1990

Month	Contract Month Mar	May	Jul	Oct	Dec
	(Cents per Pound)				
Jan	0.88	0.72	0.69	0.75	0.80
Feb	0.91	0.80	0.78	1.21	1.34
Mar	0.69	1.29	1.29	1.19	1.28
Apr	0.78	0.71	0.68	1.00	0.81
May	1.61	0.64	1.77	1.48	1.61
Jun	1.36	1.34	1.40	1.32	1.43
Jul	0.99	0.91	0.56	0.82	0.99
Aug	1.09	1.01	1.04	1.22	1.21
Sep	1.77	1.77	1.74	1.43	1.70
Oct	0.81	0.83	0.77	1.03	0.78
Nov	1.27	1.24	1.20	1.05	1.64
Dec	1.09	1.02	1.01	0.78	1.43

possession of the crop being marketed. Long hedges are used when a person will acquire physical possession of the crop in the future. Both long and short hedges follow the same procedures. Since cotton producers will have a long cash position, the growing or stored crop, the short hedge position will be discussed here.

To have a short futures position a producer would sell futures contracts for the current futures price with the promise to buy the same number of contracts back, or make delivery of the proper amount of the crop on or before the termination of the futures contract. Cotton futures contracts are 5,000 pounds per contract. Buying the futures contracts back at the same time the actual commodity is sold in the cash market is known as offsetting the futures contract. Almost all futures contracts are offset instead of making delivery.

The basis and futures contract price provide an estimate of the net selling price for the crop at a date in the future. There are two basic kinds of short hedges, a harvest hedge and a storage hedge. For cotton producers in southwest Oklahoma, a harvest hedge would use either the December or the March futures contracts. The storage hedge would use either the May, July or October futures contract. An example of a harvest hedge would begin at planting. On May 1, if the December futures price is 75 cents per pound. The Lubbock sixteen year average December basis in November is -5.57 cents per pound (Table X).

TABLE X

HARVEST HEDGE CONSTANT BASIS

	Cash	Futures	Basis
May	69.43	75	-5.57
Nov	59.43	65	-5.57
		10	
		Cash Sale	59.43
		Gain in Futures	10.00
		Net Selling Price	69.43

HARVEST HEDGE WEAKER BASIS

	Cash	Futures	Basis
May	69.43	75	-5.57
Nov	58.43	65	-6.57
		10	
		Cash Sale	58.43
		Gain in Futures	10.00
		Net Selling Price	68.43

HARVEST HEDGE STRONGER BASIS

	Cash	Futures	Basis
May	69.43	75	-5.57
Nov	60.43	65	-4.57
		10	
		Cash Sale	60.43
		Gain in Futures	10.00
		Net Selling Price	70.43

The expected selling price in November for the cotton crop would be 69.43 cents per pound (75 - 5.57 = 69.43). In November the futures price has fallen to 65 cents per pound, and the cash price has fallen to 59.43 cents per pound. The basis is -5.57 cents per pound as expected. The cotton crop is sold on the cash market for 59.43 cents per pound. By having purchased the futures contract, for 75 cents per pound and sold a contract for 65 cents per pound, 10 cents per pound is earned in the futures market. Adding the 10 cents to the cash price of 59.43 cents makes the net selling price 69.43 cents per pound which was the original estimate in May.

A weaker closing basis of -6.57 cents would have reduced the net selling price to 68.43 cents per pound. To show how a weaker basis works the previous example will be used. The December futures price in May is still 75 cents per pound, and the sixteen year average December basis in November is still -5.57 cents per pound. The expected selling price remains at 69.43 cents per pound. In November the futures price has fallen to 65 cents per pound, but the cash price has fallen to 58.43. The basis is now -6.57 cents per pound. Due to the weaker basis the expected net price is reduced. Now the cash price received for the cotton crop is 58.43 cents per pound. The gain in the futures market is still 10 cents per pound, and the net selling price is now 68.43 cents per pound.

A stronger basis of -4.57 would have increased the net

selling price to 70.43 cents per pound. In the case of a strengthening basis instead of the cash and futures prices being further apart at the time of harvest they are closer together. In May the futures price is still 75 cents per pound, the average December basis in November is still -5.57, and the expected cash price is still 69.43 cents per pound. In November the futures price has dropped to 65 cents per pound, but the cash price has only dropped to 60.43 cents per pound. The basis is now -4.57 cents per pound. The cotton is sold in the cash market for 60.43 cents per pound. The gain in the futures market is 10 cents per pound, and the net selling price is 70.43 cents per pound. Even though the basis may weaken and lower the expected hedge selling price it is still better than the not hedged price of 59.43 cents per pound in the cash market.

With a futures position the marketing risk is shifted from price risk to basis risk. This means that should the price increase or decrease during the contract period the net selling price will only be affected by the change in the basis level.

A storage hedge is similar, but a slightly different approach is taken. The difference is that the crop in storage could be sold at the current market price. By storing the crop the producer believes there will be a better price in the future. For this example, the Lubbock sixteen year average basis table will provide the July contract basis in January and in June. The January July

contract basis is needed for the storage hedge since it is possible to sell the cotton immediately (Table XI). On January 2, the futures price is 60 cents per pound, the July basis in January is -8.51 cents per pound and the cash price is 51.49 cents per pound. By June, the futures price has dropped to 50 cents per pound and the basis is now -6.42 cents per pound. The resulting cash price is 43.58 cents per pound, and the gain in the futures market is 10 cents per pound. The net selling price would be 53.58 cents per pound (43.58 + 10 = 53.58). This is 2.09 cents per pound higher than expected due to the strengthening basis from January to June.

It is important to remember that on storage hedges, the additional carrying costs must be deducted from the net selling price. From the previous cash analysis, the carrying charges are about 0.28 cents per pound per month, or 1.68 cents per pound for the six month period of the storage hedge. After deducting 1.68 cents from the 53.58 cents per pound, the net selling price would be 51.90 cents per pound. The final result would be a 0.41 cent per pound increase in the net selling price.

Other considerations in hedging are brokers fees, commissions, and margin accounts. Each futures transaction has to be performed by a broker. For performing the transaction, the broker charges a fee. This fee is usually 60 dollars per contract. When a futures contract is purchased, money to cover losses in the futures market must

TABLE XI

STORAGE HEDGE STRONGER BASIS

	Cash	Futures	Basis
Jan	51.49	60	-8.51
Jun	43.58	50	-6.42
		10	
		Cash Sale	43.58
		Gain in Futures	10.00
		Net Selling Price	53.58

be deposited with the broker. This is called a margin account. With a short futures position, a drop in the futures price will earn the holder of the short position money. The increased value of the futures market position is deposited in the margin account. An increase in the futures price would cost the holder of a short position, which would be withdrawn from the margin account. A minimum balance must be maintained, and when the account is below the minimum, the holder of the futures contract must deposit more money in the account. This money is not necessarily lost, because in a properly executed hedge, losses in the futures market will be approximately offset by gains in the cash market.

Seasonal and Marketing Loan Analysis

The regression analysis of basis is performed to analyze the effects of seasonal changes and government program marketing loans on the average cotton basis over the past sixteen years. Seasonal effects are those factors that occur naturally through the course of the marketing year. Some of the factors affecting seasonality are: weather, supply, demand, and the harvest and growing periods.

The marketing loan concept was a part of the Food Security Act of 1985. Its purpose was to make the United States more competitive in the world market. On August 1, 1986, the first of two marketing loans was implemented, and was in effect until April 24, 1987. The second marketing

loan was in effect from July 22, 1988 through March 24, 1989. During the first marketing loan, the cash price dropped dramatically. The Lubbock cash price fell from 65.50 cents per pound on July 31, 1986 to 23.55 cents per pound on August 1, 1986, a one day drop of 41.95 cents per pound. By the end of the year, prices had recovered.

The actual daily basis is calculated the same for the regression model as in the simple average model. A regression model was constructed for each contract month, and for both the Dallas and the Lubbock daily markets. The dependent variables are the Dallas and Lubbock daily basis. The independent variables are dummy variables for the twelve months and two marketing loan periods, and a time trend variable with a mean of zero. Each dummy variable was assigned a value of 0 or 1. The variable received a 1 if it was the month or marketing loan being considered or a 0 for other time periods.

The first marketing loan was not in effect for the months of May, June and July, and the second marketing loan was not in effect for the months of April, May and June. The six months, when marketing loans were not in effect, were left out of the models. The regression model has no intercept term, but includes a dummy variable for each month of the year. This was done to facilitate the compilation of the results. The trend variable was included to show changes in basis over time.

The first regression performed was an ordinary least

squares model. The model, consisting of the basis and the 31 independent variables, is shown in equation (1).

$$\begin{aligned} Basis_t = {} & B_0 Trd + B_1 DJan + B_2 DFeb + B_3 DMar + B_4 DApr \\ & + B_5 DMay + B_6 DJun + B_7 DJul + B_8 DAug + B_9 DSep \\ & + B_{10} DOct + B_{11} DNov + B_{12} DDec + B_{13} DJanML1 \\ & + B_{14} DFebML1 + B_{15} DMarML1 + B_{16} DAprML1 \\ & + B_{17} DAugML1 + B_{18} DSepML1 + B_{19} DOctML1 \\ & + B_{20} DNovML1 + B_{21} DDecML1 + B_{22} DJanML2 \\ & + B_{23} DFebML2 + B_{24} DMarML2 + B_{25} DJulML2 \\ & + B_{26} DAugML2 + B_{27} DSepML2 + B_{28} DOctML2 \\ & + B_{29} DNovML2 + B_{30} DDecML2 + e_t \end{aligned} \quad (1)$$

The variables are defined as follows:

Basis = Dallas or Lubbock cash price minus the futures price.

B_0 - B_{30} = Estimated coefficients.

Trd = Trend variable.

DJan through DDec = Dummy variables from January to December. These values represent the basis averages for each month without a marketing loan.

DJanML1 through DDecML1 = Dummy variables for the first marketing loan.

DJanML2 through DDecML2 = Dummy variables for the second marketing loan.

e_t = Error term.

The ordinary least squares model was estimated separately for each contract in both the Dallas and Lubbock markets. The results indicated significant first-order serial correlation. The determination that serial correlation was a problem was based on the Durbin Watson test (Table XII). The Durbin Watson test statistic has a

TABLE XII

DURBIN WATSON

Dallas		Lubbock	
March	0.058	March	0.045
May	0.091	May	0.073
July	0.164	July	0.128
October	0.044	October	0.034
December	0.046	December	0.036

range from 0 to 4, with a test value of 2 meaning serial correlation is not a problem. The farther from a value of 2 that the test statistic is the more likely event that serial correlation is a problem. A general rule for using the Durbin Watson test is if the test values are below 1.25 or above 2.75 then serial correlation is a problem. In all of the ordinary least squares models the Durbin Watson has a value of less than one.

A nonlinear regression model was used to correct for serial correlation. The ordinary least squares and the nonlinear models use the same dependent and independent variables. A first-order error term process is added to the model to correct for serial correlation.

The nonlinear regression model is shown in equation (2).

$$\begin{aligned} Lubbas3_t = {} & B_0 DJan + B_1 DFeb + B_2 DMar + B_3 DApr + B_4 DMay \\ & + B_5 DJun + B_6 DJul + B_7 DAug + B_8 DSep + B_9 DOct \\ & + B_{10} DNov + B_{11} DDec + B_{12} DJanMl1 + B_{13} DFebML1 \\ & + B_{14} DMarML1 + B_{15} DAprML1 + B_{16} DAugML1 \\ & + B_{17} DSepML1 + B_{18} DOctML1 + B_{19} DNovML1 \\ & + B_{20} DDecML1 + B_{21} DJanML2 + B_{22} DFebML2 \\ & + B_{23} DMarML2 + B_{24} DJulML2 + B_{25} DAugML2 \\ & + B_{26} DSepML2 + B_{27} DOctML2 + B_{28} DNovML2 \\ & + B_{29} DDecML2 + B_{30} DLubtrd3 + e_t \end{aligned} \qquad (2)$$

The variables are defined as follows:

Lubbas3 = Lubbock cash price minus the futures price for the March contract.

B_0 - B_{30} = Estimated coefficients.

DJan through DDec = Dummy variables from January to December. These values represent the basis averages without

a marketing loan.

DJanML1 through DDecML1 = Dummy variables for the first marketing loan.

DJanML2 through DDecML2 = Dummy variables for the second marketing loan.

DLubtrd3 = Time trend for the Lubbock March contract.

e_t = Rho e_{t-1} + v_t.

The equations for the other nine contract months are the same as for the Lubbock March contract presented.

The nonlinear regression model can be expanded to include seemingly unrelated correlation. Instead of running a separate model for each contract month, it is necessary to run all ten equations in the model at the same time in the seemingly unrelated regression procedure. The reason for this is the model stores the residuals for each equation and places them in a covariance matrix. The matrix is inverted and placed back into the equations and the model is run again.

The results from the seemingly unrelated procedure showed that the covariance matrix was almost singular (Table XIII). Variations in basis across contracts are so similar, they provided no new information for the estimation process.

The R-squared value shows the extent to which the regression equations explained variations in basis levels. R-squared values range from 0 to 1. An R-squared of 1 means that 100 percent of the variation is explained and a 0 means the model did not explain any. The R-squared values for

TABLE XIII

CORRELATION OF RESIDUALS

		Dallas					Lubbock				
		Mar	May	Jul	Oct	Dec	Mar	May	Jul	Oct	Dec
Dallas	Mar	1.00	0.97	0.89	0.97	0.97	0.98	0.95	0.88	0.95	0.96
	May	0.97	1.00	0.91	0.94	0.94	0.95	0.98	0.90	0.92	0.93
	Jul	0.89	0.91	1.00	0.88	0.88	0.87	0.88	0.97	0.86	0.86
	Oct	0.97	0.94	0.88	1.00	0.98	0.95	0.92	0.87	0.98	0.97
	Dec	0.97	0.94	0.88	0.98	1.00	0.95	0.93	0.87	0.97	0.98
Lubbock	Mar	0.98	0.95	0.87	0.95	0.95	1.00	0.97	0.90	0.97	0.98
	May	0.95	0.98	0.88	0.92	0.93	0.97	1.00	0.92	0.95	0.95
	Jul	0.88	0.90	0.97	0.87	0.87	0.90	0.92	1.00	0.89	0.89
	Oct	0.95	0.92	0.86	0.98	0.97	0.97	0.95	0.89	1.00	0.99
	Dec	0.96	0.93	0.86	0.97	0.98	0.98	0.95	0.89	0.99	1.00

this analysis show that between 40 to 50 percent of the basis variation is explained by the models (Table XIV). The exceptions are the May and July contracts for each marketing region. In May and July the R-squared values are .3146 .1901 respectively for the Dallas market, and .3467 and .2029 respectively for the Lubbock market.

For the trend and Rho variables, the estimates and the levels of significance are also presented in Table XIV. The level of significance tells whether the estimate is significantly different from zero. The level of significance for the time trend variables varies with each equation. The most significant trend variable is the Lubbock October contract at the 99.98 percent level. The least significant trend variable is the Dallas May contract at the 15 percent level.

The trend variable shows a very slight positive trend over time. The increase in basis is approximately 2 cents per pound over the seventeen year period.

The Rho estimates are all significantly different from zero. In all 10 equations, the Rho estimate is significant at the 99.99 percent level. The Rho estimate is positive for all of the contract months. Rho shows that over time when basis is strong today basis will probably be strong tomorrow, and when basis is weak today it will probably be weak tomorrow.

The results of the nonlinear regression model are presented in Tables XV, XVI and XVII. Table XV is the

TABLE XIV

REGRESSION TEST VALUES

	R-squared	Number of Observations	Trend*	Rho*
Dallas Contracts				
March	0.4180	2819	0.00021	0.61
			(0.1527)	(0.0001)
May	0.3146	2819	-0.00002	0.51
			(0.8432)	(0.0001)
July	0.1901	2819	-0.00024	0.34
			(0.0029)	(0.0001)
October	0.4809	2819	0.00038	0.68
			(0.0321)	(0.0001)
December	0.4967	2819	0.00029	0.69
			(0.0998)	(0.0001)
Lubbock Contracts				
March	0.4516	2819	0.00050	0.63
			(0.0009)	(0.0001)
May	0.3467	2819	0.00028	0.53
			(0.0194)	(0.0001)
July	0.2029	2819	0.00006	0.35
			(0.4252)	(0.0001)
October	0.5096	2819	0.00067	0.69
			(0.0002)	(0.0001)
December	0.5188	2819	0.00059	0.70
			(0.0013)	(0.0001)

* Numbers in Parenthesis are the level of significance.

TABLE XV

LUBBOCK AVERAGE BASIS FROM REGRESSION

Month	Contract Month Mar*	May*	Jul*	Oct*	Dec*
	(Cents per Pound)				
Jan	-8.36	-9.00	-9.08	-7.06	-5.91
	(0.79)	(0.63)	(0.44)	(0.93)	(0.93)
Feb	-6.32	-7.37	-8.00	-4.64	-3.48
	(0.74)	(0.61)	(0.43)	(0.85)	(0.85)
Mar	-7.25	-7.89	-8.34	-5.08	-3.95
	(1.11)	(0.96)	(0.74)	(1.21)	(1.22)
Apr	-3.28	-6.73	-6.73	-3.33	-2.34
	(0.78)	(0.62)	(0.42)	(0.93)	(0.93)
May	-3.28	-6.66	-6.41	-3.36	-2.38
	(1.08)	(0.94)	(0.73)	(1.19)	(1.19)
Jun	-4.10	-4.60	-6.82	-3.91	-3.27
	(0.74)	(0.58)	(0.40)	(0.87)	(0.88)
Jul	-4.12	-4.55	-7.55	-4.04	-3.31
	(1.06)	(0.92)	(0.71)	(1.15)	(1.16)
Aug	-7.23	-7.90	-8.25	-5.99	-6.10
	(0.73)	(0.58)	(0.40)	(0.85)	(0.86)
Sep	-6.99	-7.64	-7.78	-5.56	-5.81
	(0.68)	(0.56)	(0.40)	(0.78)	(0.78)
Oct	-7.30	-8.10	-8.26	-5.73	-6.14
	(1.03)	(0.89)	(0.68)	(1.12)	(1.12)
Nov	-5.87	-6.60	-6.83	-3.63	-4.73
	(0.80)	(0.63)	(0.43)	(0.95)	(0.96)
Dec	-6.16	-6.99	-7.39	-4.17	-4.83
	(1.16)	(1.00)	(0.78)	(1.27)	(1.27)

* Numbers in parenthesis are the standard errors

TABLE XVI

LUBBOCK AVERAGE BASIS FOR MARKETING LOAN 1

Month	Contract Month Mar*	May*	Jul*	Oct*	Dec*
	(Cents per Pound)				
Jan	5.04	6.69	7.42	5.93	5.50
	(3.17)	(2.53)	(1.75)	(3.70)	(3.72)
Feb	2.51	5.41	7.36	2.83	2.24
	(2.89)	(2.37)	(1.70)	(3.31)	(3.33)
Mar	2.36	5.86	8.10	4.02	3.53
	(4.29)	(3.70)	(2.83)	(4.69)	(4.70)
Apr	-1.54	1.55	3.34	-1.09	-1.66
	(3.30)	(2.68)	(1.88)	(3.72)	(3.73)
Aug	-2.95	-2.62	-2.49	-2.54	-3.21
	(3.08)	(2.46)	(1.70)	(3.59)	(3.62)
Sep	-5.69	-5.61	-5.83	-5.62	-5.84
	(2.77)	(2.26)	(1.62)	(3.17)	(3.19)
Oct	-2.29	-1.46	-1.30	-2.73	-2.95
	(4.10)	(3.51)	(2.65)	(4.50)	(4.51)
Nov	-0.49	0.48	0.98	-4.40	-1.54
	(3.32)	(2.61)	(1.79)	(3.92)	(3.96)
Dec	-0.69	0.16	0.71	-4.24	-1.82
	(4.34)	(3.72)	(2.84)	(4.80)	(4.82)

* Numbers in parenthesis are the standard errors

TABLE XVII

LUBBOCK AVERAGE BASIS FOR MARKETING LOAN 2

Month	Contract Month Mar*	May*	Jul*	Oct*	Dec*
	(Cents per Pound)				
Jan	2.40	3.34	4.06	1.40	0.66
	(3.12)	(2.48)	(1.72)	(3.64)	(3.66)
Feb	-0.28	0.73	1.86	-2.69	-3.59
	(2.90)	(2.38)	(1.70)	(3.32)	(3.34)
Mar	1.01	0.58	0.65	-3.30	-4.29
	(4.30)	(3.71)	(2.84)	(4.70)	(4.71)
Aug	6.62	7.86	8.52	3.31	5.16
	(2.98)	(2.37)	(1.63)	(3.47)	(3.50)
Sep	3.59	4.35	4.38	0.10	2.40
	(2.79)	(2.27)	(1.62)	(3.20)	(3.22)
Oct	2.17	3.18	3.74	-2.51	0.90
	(4.45)	(3.88)	(3.02)	(4.82)	(4.83)
Nov	0.12	1.26	2.00	-2.66	-1.08
	(3.19)	(2.50)	(1.72)	(3.78)	(3.82)
Dec	-0.46	0.68	1.40	-2.71	-2.60
	(4.52)	(3.93)	(3.05)	(4.96)	(4.97)

* Numbers in parenthesis are the standard errors

average basis for each month of each contract month. Tables XVI and XVII are the average basis for the two marketing loan periods. The top numbers, in all three tables, are the average basis and the numbers in parenthesis are the standard errors. The level of significance of each basis estimate is shown by the size of the standard error. The larger the standard error the more likely the estimate is not significantly different from zero. For Table XV all of the estimates have small standard errors. This means that all of the estimates are significant. The estimates in Tables XVI and XVII have much larger standard errors and are not as significant.

To analyze the results, the average basis value for each contract month was graphed. Included on the graph is the average basis, plus one standard error, and minus one standard error. This is useful because approximately two thirds of the basis observations will fall between plus and minus one standard error. Figure 7 shows that for the Lubbock December contract the basis has strengthened from January through April. In April, the basis begins to weaken, and between July and August 1, weakens dramatically. From August 1, through the rest of the contract life basis shows a gradual strengthening trend.

In the other four graphs, it can be seen that in all five contract months the average basis weakens in the months of January and August (Figures 8,9,10 and 11). The reason the basis weakens in these two months is that cash prices

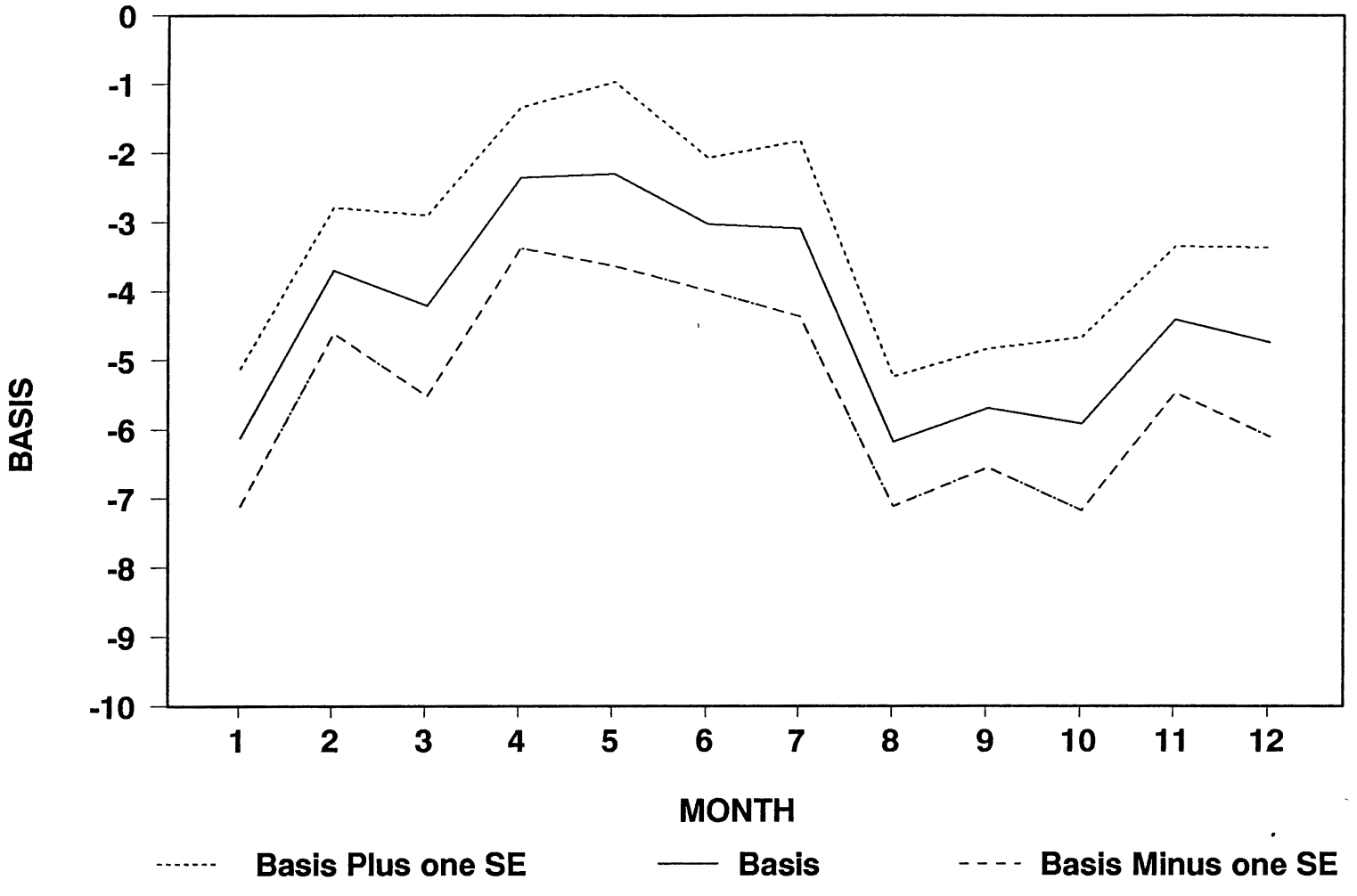

Figure 7. Lubbock December Contract Basis Plus and Minus One Standard Error

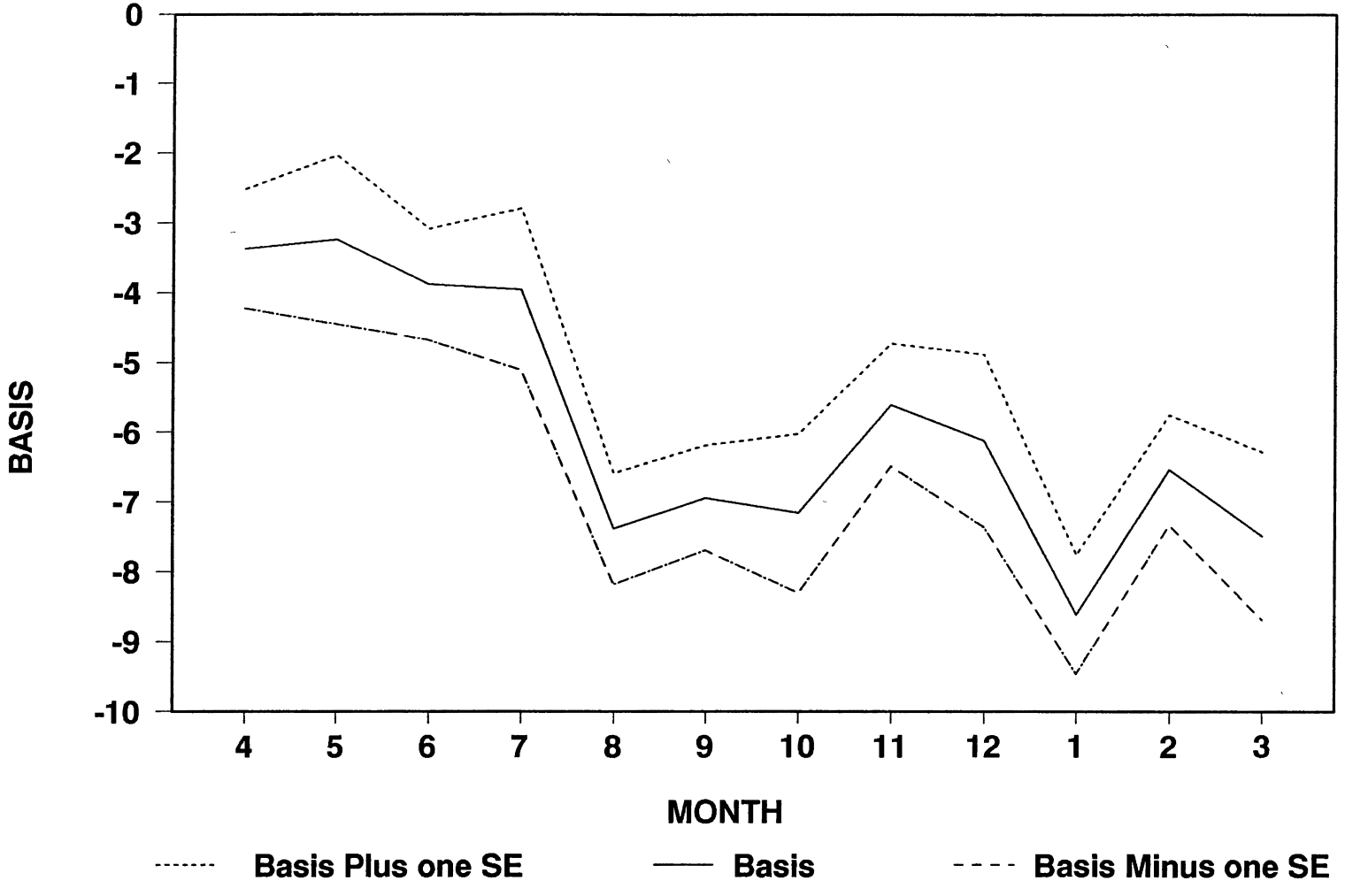

Figure 8. Lubbock March Contract Basis Plus and Minus One Standard Error

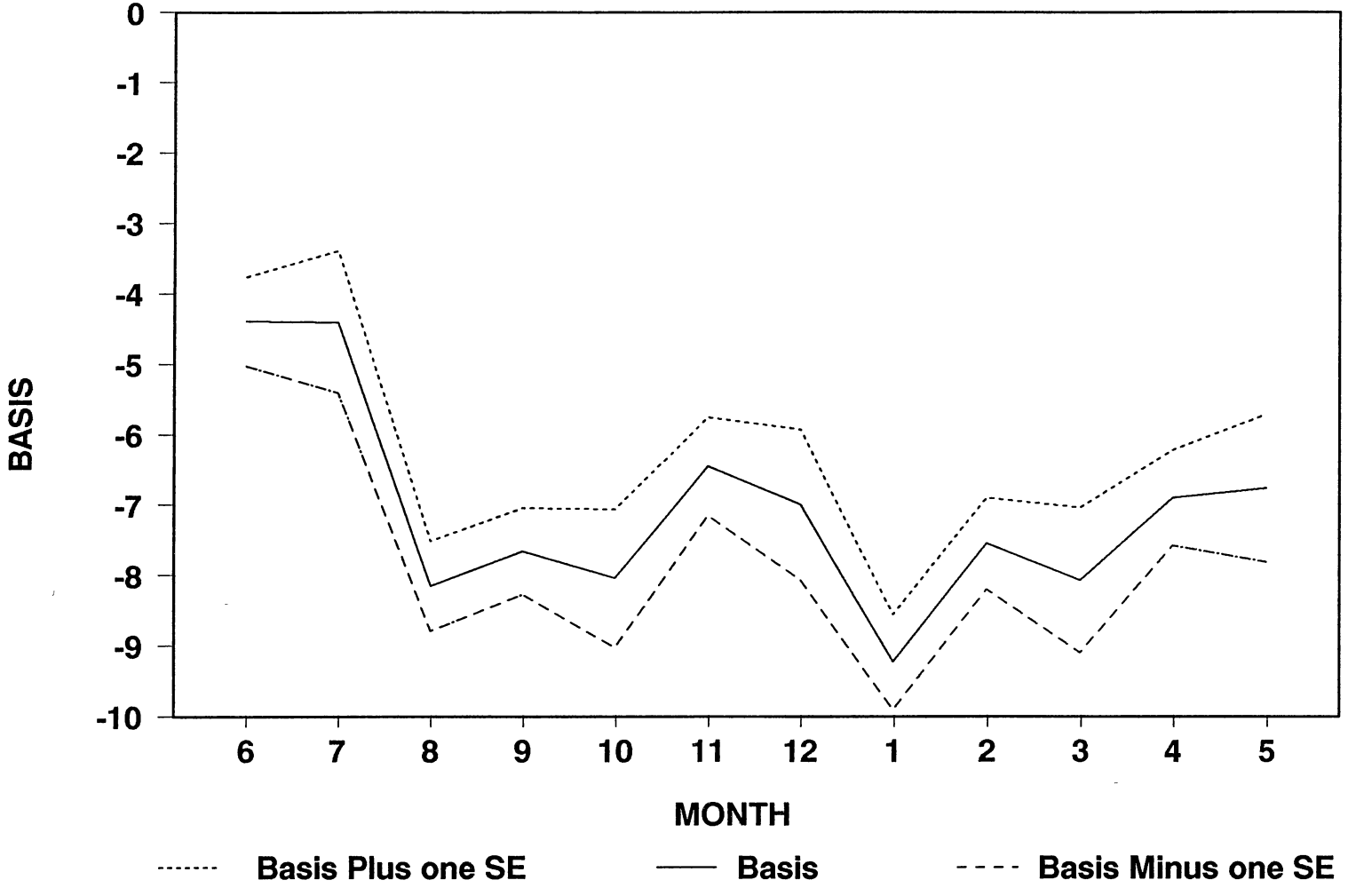

Figure 9. Lubbock May Contract Basis Plus and Minus One Standard Error

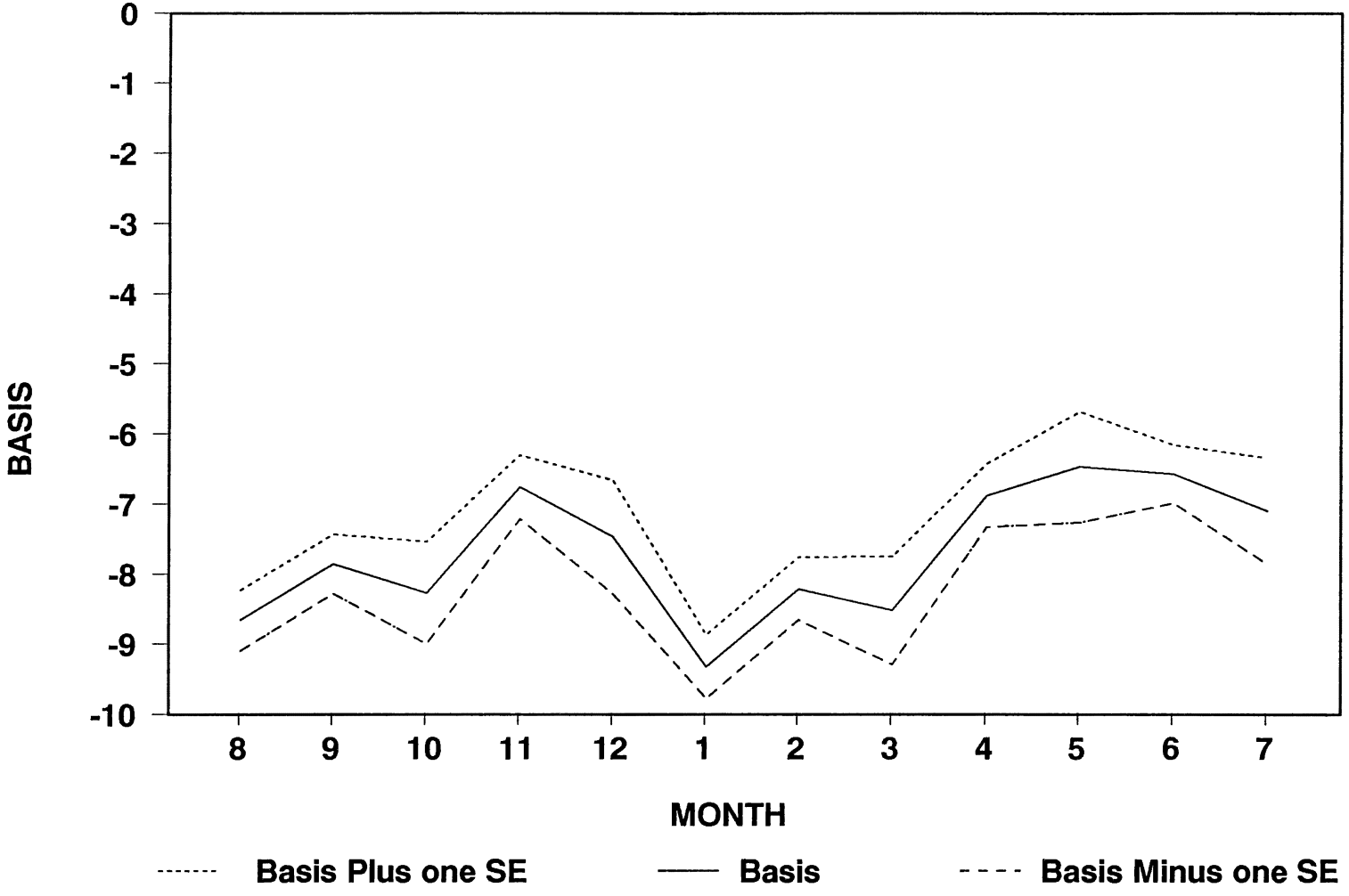

Figure 10. Lubbock July Contract Basis Plus and Minus One Standard Error

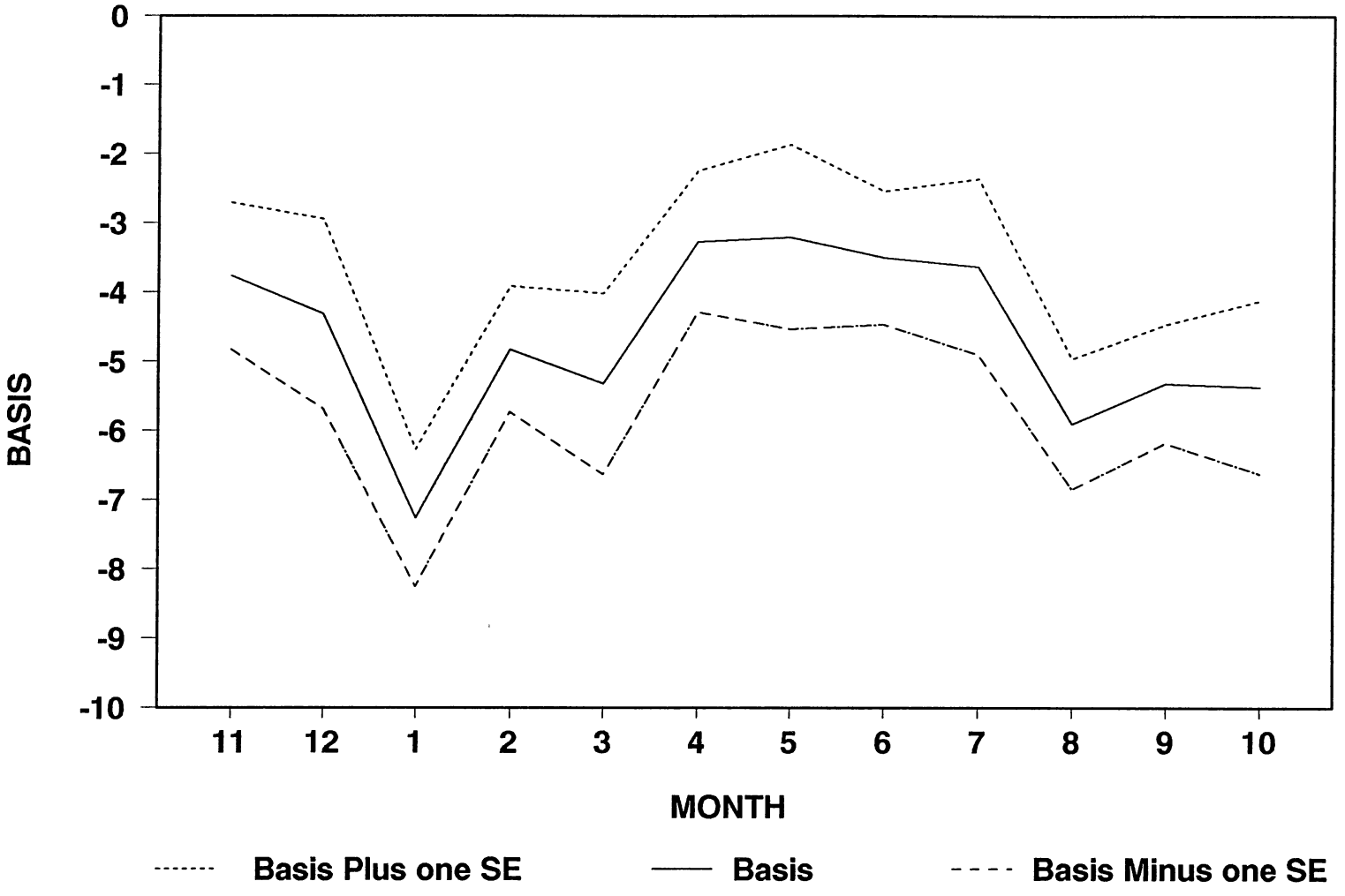

Figure 11. Lubbock October Contract Basis Plus and Minus One Standard Error

fall relative to futures contract prices. Cash price declines may be due to the beginning of the new marketing year in August and the beginning of the new tax year in January.

The seasonality effects are measured by using the dummy variables for each month in the regression model. By assigning each month a dummy variable of 0 or 1 the basis data were broken down into the individual months and averaged over the seventeen year period. A comparison of the simple average estimates and the regression estimates shows that both are very similar. The difference in the two estimates is primarily due to the serial correlation and the trend variable. By correcting for the serial correlation and including the trend variable the regression model is a better estimate of the past basis levels than the simple average estimate.

The effect of the two marketing loan periods on the basis level is more dramatic than the seasonality effects. By having the marketing loan dummy variables with the monthly dummy variables, the average basis estimates are for only the time periods during the marketing loans. Tables XV, XVI and XVII show that during the two marketing loan periods the basis was stronger than the average basis. During the first marketing loan the November basis for the December contract was -2.47 cents per pound. This was 1.94 cents per pound stronger than the average basis of -4.41 cents per pound. This means that a person who had a short

hedge during the first marketing loan period could have anticipated receiving a 1.94 cent per pound increase in the expected net price. This higher net price is due to the strengthening basis level.

The results are the same for the second marketing loan period. The basis is stronger during the period than on average. The second marketing loan period starts on July 24. There was not enough data available to estimate the parameters and there value was zero. Due to the inability to estimate the July parameters for the second marketing loan period the month of July is omitted.

CHAPTER IV

SUMMARY AND CONCLUSIONS

Summary

Cotton producers need good marketing skills to remain competitive. Understanding the available marketing strategies and the concepts associated with them is the best approach for a modern agriculturalist to ensure consistent marketing performance. Due to a lack of understanding, or possibly not wanting to try anything new, some producers sell their crop in the cash market at harvest. There is nothing wrong or incorrect with this approach. In fact, the simple cash sale at harvest is the very first and most basic of all marketing techniques.

The purpose of this study was to analyze some of the marketing strategies available to cotton producers. This study has looked at several alternative marketing strategies, and addressed the basic underlying components of utilizing the futures market. The analysis deals with two different ways of using the cash market, how the futures market is used for hedging in the cash market, an estimation of basis, and an explanation of how basis works. An estimation of the impacts of seasonality and the two marketing loan periods basis is also analyzed. The study

was done for the Lubbock and Dallas marketing regions, with an emphasis on cotton in southwestern Oklahoma. A discussion of criteria that has an impact on the marketing of cotton was also provided. This discussion includes the government programs and how cotton is graded and the meaning of the different grades.

Conclusions

From the cash marketing analysis two main conclusions can be drawn. First, the highest average net cash price is between May 15 and July 15. Second, the average price drops dramatically after the first of August and all cash sales should be made before August 1 on average.

From the analysis of basis it is important to have good basis estimates to base hedging strategies on. An understanding of basis strengths and weaknesses provides producers the ability to efficiently use futures marketing strategies. The comparison of the marketing loan periods to the average basis levels provides an example of how government programs affect the marketing system.

The analysis shows that a potential for increasing the net price exists for the producer who is actively involved in the marketing process. Through the use of the futures contracts an approximate selling price can be established in the future. Depending on the change in the basis level the user of the futures market can realize a profit on the proper execution of the futures hedge.

An advantage to the use of a futures hedge over the cash sale is that the risk is shifted from price risk to basis risk. When the price declines over the contract period the risk of a price loss is reduced. A disadvantage of this is that gains on increases in the cash price are not realized.

Limitations and Further Study

This study was conducted to analyze marketing strategies for cotton producers in the Lubbock and Dallas marketing regions. All of the price information and the analysis is performed on the standard grade and staple of cotton. It would be necessary to conduct the analysis on different grades and staples to be more accurate. The reason is that very often the cotton produced in the regions of the study is not the standard grade and staple. Other factors to consider are the impact of substitutes and compliments, export and import levels, and difference in location of various individuals. The inclusion of other marketing strategies would be beneficial in increasing the marketing effectiveness of cotton producers.

This analysis does not support the selection of a definite marketing strategy. It is intended to provide an understanding of the marketing strategies considered, and to provided estimates to base future marketing decisions on.

A SELECTED BIBLIOGRAPHY

"Amended Official Cotton Standards of the United States for the Grade of American Upland Cotton (Universal Standards)," Cotton Division, Agricultural Marketing Service, United States Department of Agriculture, CN 918-1 Exhibit B.

Anderson, Kim B., "Wheat Basis," Oklahoma State University, Agricultural Extension Current Report No. CR-502.

Anderson, Kim B. and Brian Adam, "Cash marketing Wheat," Oklahoma State University, Agricultural Extension Facts No. 516.

Barr, Jess, Agricultural Economist, National Cotton Council, Personal Interview, January 9, 1991.

"Cotton and Wool Situation and Outlook," Commodity Economics Division, Economic Research Service, United States Department of Agriculture, May 1991, CWS-64.

"Explanation of High Volume Instrument (HVI) Fiber Measurements on the Class Card for Classing Offices Equipped with Video Trashmeters," Cotton Division, Agricultural Marketing Service, United States Department of Agriculture, July 1990.

Firch, Robert S. and Ghazi Al-Sakkaf, "Cotton Put Options: Low Price Insurance?," in 1986 Proceedings of Beltwide Cotton Production Research Conferences, ed. T. Cotton Nelson, (National Cotton Council of America, 1986), pp. 319-322.

Hall, R.C., Manager, Oklahoma Cotton Cooperative Association Compress, Personal Interview, April 30, 1991.

Lippke, Lawrence A. and Thomas L. Sporleder, "Short Hedge Performance of Cotton Options," in 1986 Proceedings of Beltwide Cotton Production Research Conferences, ed. T. Cotton Nelson, (National Cotton Council of America, 1986), pp 315-317.

"Options on Agricultural Futures: A Home Study Course," Chicago Board of Trade, 1986, EM 272.

Shafer, C.E. and C.G. Anderson, "Hedging Ratios for all Futures Delivery Months: Memphis, Dallas, Lubbock Price Quotes, 1970-1988," in 1990 Proceedings of Beltwide Cotton Production Research Conferences, ed. Deborah A. Ritcher, (National Cotton Council of America, 1990), pp. 428-430.

Shafer, C.E., C.G. Anderson and W.C. Hundl, "Spot Quotations-Future Price Basis Behavior in Cotton," in 1989 Proceedings of Beltwide Cotton Production Research Conferences, ed. Deborah A. Richter, (National Cotton Council of America, 1989), pp. 425-427.

Stults, Harold, Edward H. Glade Jr., Scott Sanford and Leslie A. Meyer, "Cotton Background for 1990 Farm Legislation," Commodity Economics Division, Economic Research Service, United States Department of Agriculture, AGES 89-42.

Torok, Steven J. and Willian E. Beach, "Selected Cotton Option Hedges," in 1988 Proceedings of Beltwide Cotton Production Research Conferences, ed. T. Cotton Nelson, (National Cotton Council of America, 1986), pp. 322, 323.

Ward, Jerry, Agricultural Marketing Services Area Director, Cotton Committee, Altus, Oklahoma, Personal Interview, April 29, 1991.

Wood, Wendell, "Alternative Option Hedging Strategies," in 1989 Proceedings of Beltwide Cotton Production Research Conferences, ed. Deborah A. Richter, (National Cotton Council of America, 1990), pp. 410-412.

APPENDIX

DALLAS RESULTS

TABLE XVIII

DALLAS PERFECT PRICE

Year	Nov 1 - Oct 31			Dec 1 - Nov 30			Jan 1 - Dec 31			Jan 1 - Jul 31	
	Nov 1 Price	Sell Date	Sell Price	Dec 1 Price	Sell Date	Sell Price	Jan 1 Price	Sell Date	Sell Price	Sell Date	Sell Price
1973	63.00	12/28	74.68	66.00	12/28	74.85	75.00	1/2	74.99	1/2	74.99
1974	41.50	9/30	49.62	37.50	9/30	49.81	34.50	12/16	53.27	7/22	43.70
1975	47.75	7/6	76.90	51.00	7/6	77.09	55.25	7/6	77.29	7/6	77.29
1976	76.50	11/1	76.49	73.50	3/21	74.24	67.50	3/21	74.45	3/21	74.45
1977	46.00	10/25	60.43	46.25	11/24	60.93	46.50	11/24	61.15	7/31	54.73
1978	61.75	11/24	63.33	63.25	12/1	63.24	60.00	12/31	62.86	1/3	60.23
1979	60.00	9/12	86.46	61.75	9/12	86.75	66.75	9/12	87.05	7/30	76.97
1980	83.50	11/25	86.26	85.50	12/8	86.17	85.00	1/6	85.94	1/6	85.94
1981	57.75	7/22	61.78	54.50	7/22	62.09	54.00	7/22	62.41	7/22	62.41
1982	57.50	6/24	69.15	58.00	6/24	69.45	58.50	6/24	69.76	6/24	69.76
1983	70.75	5/29	75.37	70.25	5/29	75.67	68.50	5/29	75.98	5/29	75.98
1984	60.75	11/1	60.74	59.00	12/5	59.20	57.75	4/8	58.53	4/8	58.53
1985	55.05	7/29	61.65	56.05	7/29	61.94	58.25	7/29	62.24	7/29	62.24
1986	44.15	8/27	72.13	46.90	8/27	72.42	55.40	8/27	72.71	7/30	69.23
1987	59.75	11/24	63.52	63.75	12/1	63.74	58.50	1/7	58.92	1/7	58.92
1988	51.25	8/28	65.52	51.25	8/28	65.86	53.75	8/28	66.22	7/26	63.10
1989	66.00	7/27	75.21	64.00	7/27	75.55	63.00			7/27	75.90
Avg	59.00		69.37	59.32		69.35	59.89		68.99	67.32	

TABLE XIX

DALLAS ACTUAL AND NET AVERAGE CASH PRICES
NOVEMBER 1 THROUGH OCTOBER 31, 73-90

Date	Actual Price	Net Price
November 1	59.00	58.98
November 15	58.75	58.60
December 1	59.32	59.04
December 15	59.85	59.43
January 1	59.89	59.32
January 15	59.07	58.36
February 1	59.10	58.24
February 15	59.32	58.33
March 1	59.69	58.58
March 15	60.25	59.00
April 1	60.96	59.56
April 15	61.35	59.82
May 1	62.19	60.52
May 15	62.47	60.66
June 1	62.53	60.58
June 15	62.09	60.00
July 1	63.13	60.91
July 15	63.23	60.87
August 1	60.95	58.44
August 15	59.88	57.23
September 1	59.59	56.79
September 15	59.08	56.15
October 1	59.40	56.33
October 15	59.79	56.59

TABLE XX

DALLAS ACTUAL AND NET AVERAGE CASH PRICES
DECEMBER 1 THROUGH NOVEMBER 30, 73-90

Date	Actual Price	Net Price
December 1	59.32	59.30
December 15	59.85	59.70
January 1	59.89	59.59
January 15	59.07	58.63
February 1	59.10	58.51
February 15	59.32	58.60
March 1	59.69	58.85
March 15	60.25	59.27
April 1	60.96	59.83
April 15	61.35	60.09
May 1	62.19	60.79
May 15	62.47	60.94
June 1	62.53	60.85
June 15	62.09	60.27
July 1	63.13	61.18
July 15	63.23	61.14
August 1	60.95	58.71
August 15	59.88	57.51
September 1	59.59	57.07
September 15	59.08	56.42
October 1	59.40	56.61
October 15	59.79	56.86
November 1	59.41	56.33
November 15	58.95	55.74

TABLE XXI

DALLAS ACTUAL AND NET AVERAGE CASH PRICES
JANUARY 1 THROUGH DECEMBER 31, 74-89

Date	Actual Price	Net Price
January 1	59.70	59.68
January 15	58.82	58.67
February 1	58.85	58.56
February 15	58.94	58.51
March 1	59.31	58.76
March 15	59.81	59.12
April 1	60.53	59.70
April 15	60.95	59.99
May 1	61.67	60.57
May 15	62.02	60.78
June 1	61.86	60.48
June 15	61.78	60.27
July 1	62.67	61.03
July 15	62.43	60.65
August 1	59.87	57.94
August 15	59.17	57.11
September 1	58.81	56.61
September 15	58.52	56.18
October 1	58.99	56.52
October 15	59.28	56.67
November 1	58.75	56.00
November 15	58.48	55.60
December 1	58.90	55.88
December 15	59.28	56.12

TABLE XXII

DALLAS ACTUAL AND NET AVERAGE CASH PRICES
JANUARY 1 THROUGH DECEMBER 31, 74-89
MINUS AUGUST 1 - DECEMBER 31, 86

Date	Actual Price	Net Price
January 1	59.70	59.68
January 15	58.82	58.67
February 1	58.85	58.56
February 15	58.94	58.51
March 1	59.31	58.76
March 15	59.81	59.12
April 1	60.53	59.70
April 15	60.95	59.99
May 1	61.67	60.57
May 15	62.02	60.78
June 1	61.86	60.48
June 15	61.78	60.27
July 1	62.67	61.03
July 15	62.43	60.65
August 1	62.28	60.37
August 15	61.47	59.42
September 1	61.02	58.83
September 15	60.48	58.15
October 1	60.28	57.82
October 15	60.22	57.63
November 1	59.72	56.98
November 15	59.49	56.61
December 1	59.70	56.70
December 15	59.47	56.33

TABLE XXIII

AVERAGE MONTHLY COTTON BASIS FOR DALLAS
JUNE 1974 - MAY 1990

Month	Contract Month Mar	May	Jul	Oct	Dec
	(Cents per Pound)				
Jan	-6.80	-7.70	-8.11	-5.93	-5.06
Feb	-6.53	-7.40	-7.84	-5.41	-4.73
Mar	-6.44	-6.62	-6.94	-4.15	-3.57
Apr	-3.45	-5.92	-6.08	-3.07	-2.46
May	-3.56	-6.24	-6.27	-3.35	-2.65
Jun	-3.67	-4.22	-6.04	-3.23	-2.77
Jul	-3.49	-4.04	-6.28	-2.86	-2.60
Aug	-6.49	-7.18	-7.66	-5.01	-5.34
Sep	-6.96	-7.79	-8.20	-5.03	-5.67
Oct	-6.89	-7.65	-7.90	-5.27	-5.67
Nov	-6.94	-7.81	-8.10	-5.69	-5.48
Dec	-6.24	-7.07	-7.42	-5.20	-4.75

TABLE XXIV

AVERAGE MONTHLY COTTON BASIS FOR DALLAS
JUNE 1989 - MAY 1990

Month	Contract Month Mar	May	Jul	Oct	Dec
	(Cents per Pound)				
Jan	-4.95	-5.97	-6.12	-3.82	-2.54
Feb	-4.22	-5.68	-5.93	-2.77	-1.45
Mar	-3.79	-4.65	-5.00	0.03	1.46
Apr	1.82	-5.47	5.16	0.54	2.66
May	0.77	-4.84	-7.09	-1.30	1.60
Jun	-7.76	-8.24	-5.10	-6.82	-6.94
Jul	-10.03	-10.32	-4.35	-8.70	-9.40
Aug	-9.77	-10.16	-9.98	-8.12	-8.93
Sep	-8.72	-9.52	-9.61	-7.26	-7.74
Oct	-8.62	-9.28	-9.22	-8.51	-7.31
Nov	-7.24	-8.01	-7.95	-2.00	-5.00
Dec	-5.66	-6.41	-6.33	-2.53	-2.39

TABLE XXV

STANDARD DEVIATIONS OF MONTHLY
COTTON BASIS FOR DALLAS
JUNE 1974 - MAY 1990

Month	Contract Month Mar	May	Jul	Oct	Dec
	(Cents per Pound)				
Jan	2.35	2.78	3.48	5.30	5.88
Feb	3.03	3.29	3.77	6.14	6.48
Mar	2.43	2.51	2.56	6.77	7.10
Apr	8.35	2.47	2.33	8.07	8.23
May	8.42	2.11	1.75	8.19	8.36
Jun	9.13	9.11	2.66	9.07	9.08
Jul	9.61	9.63	2.73	9.61	9.52
Aug	3.51	3.71	3.97	2.78	3.22
Sep	2.75	2.91	3.26	2.44	2.60
Oct	2.18	2.36	2.73	1.79	1.91
Nov	2.35	2.66	3.08	4.61	1.91
Dec	2.39	2.72	3.19	4.61	1.65

TABLE XXVI

STANDARD DEVIATION OF MONTHLY COTTON BASIS FOR DALLAS JUNE 1989 - MAY 1990

Month	Contract Month Mar	May	Jul	Oct	Dec
	(Cents per Pound)				
Jan	0.81	0.82	0.88	1.13	1.19
Feb	0.90	0.82	0.81	1.27	1.39
Mar	1.15	1.12	1.09	0.88	0.94
Apr	1.18	1.37	1.09	1.08	1.17
May	1.69	1.60	2.15	1.65	1.69
Jun	1.45	1.43	1.55	1.42	1.52
Jul	1.13	1.03	0.45	0.95	1.13
Aug	1.50	1.42	1.42	1.64	1.64
Sep	0.94	0.92	0.93	0.97	0.96
Oct	1.04	1.02	0.96	1.42	1.04
Nov	1.57	1.52	1.48	1.13	1.98
Dec	1.35	1.21	1.18	0.80	1.55

TABLE XXVII

DALLAS AVERAGE BASIS FROM REGRESSION MODEL

Month	Contract Month Mar*	May*	Jul*	Oct*	Dec*
	(Cents per Pound)				
Jan	-7.61	-8.27	-8.40	-6.32	-5.13
	(0.76)	(0.60)	(0.43)	(0.90)	(0.91)
Feb	-5.93	-6.98	-7.59	-4.24	-3.07
	(0.71)	(0.58)	(0.43)	(0.82)	(0.84)
Mar	-6.55	-7.13	-7.51	-4.42	-3.27
	(1.08)	(0.93)	(0.73)	(1.19)	(1.20)
Apr	-2.80	-6.24	-6.22	-2.87	-1.87
	(0.75)	(0.59)	(0.42)	(0.89)	(0.91)
May	-2.66	-6.05	-5.81	-2.75	-1.76
	(1.06)	(0.91)	(0.72)	(1.17)	(1.18)
Jun	-3.68	-4.19	-6.43	-3.49	-2.83
	(0.70)	(0.55)	(0.39)	(0.84)	(0.86)
Jul	-3.43	-3.83	-6.79	-3.39	-2.65
	(1.03)	(0.89)	(0.71)	(1.13)	(1.14)
Aug	-6.45	-7.13	-7.49	-5.21	-5.31
	(0.70)	(0.55)	(0.40)	(0.82)	(0.84)
Sep	-6.35	-7.00	-7.13	-4.95	-5.19
	(0.65)	(0.53)	(0.39)	(0.76)	(0.77)
Oct	-6.64	-7.43	-7.59	-5.07	-5.47
	(1.00)	(0.86)	(0.67)	(1.10)	(1.11)
Nov	-5.76	-6.49	-6.70	-3.55	-4.65
	(0.76)	(0.60)	(0.43)	(0.92)	(0.94)
Dec	-6.09	-6.92	-7.32	-4.10	-4.74
	(1.12)	(0.98)	(0.77)	(1.24)	(1.25)

* Numbers in parenthesis are the standard errors

TABLE XXVIII

DALLAS AVERAGE BASIS FOR MARKETING LOAN 1

Month	Contract Month Mar*	May*	Jul*	Oct*	Dec*
	(Cents per Pound)				
Jan	3.45	5.17	6.02	4.30	3.90
	(3.03)	(2.42)	(1.73)	(3.58)	(3.64)
Feb	2.64	5.46	7.29	2.98	2.38
	(2.78)	(2.28)	(1.68)	(3.22)	(3.26)
Mar	1.77	5.27	7.45	3.46	2.96
	(4.17)	(3.60)	(2.82)	(4.61)	(4.65)
Apr	-1.25	1.84	3.51	-0.73	-1.31
	(3.16)	(2.57)	(1.87)	(3.63)	(3.68)
Aug	-4.09	-3.82	-3.74	-3.60	-4.28
	(2.94)	(2.35)	(1.68)	(3.48)	(3.54)
Sep	-6.19	-6.05	-6.19	-6.15	-6.35
	(2.66)	(2.17)	(1.60)	(3.08)	(3.13)
Oct	-1.26	-0.30	-0.02	-1.85	-2.08
	(3.98)	(3.40)	(2.64)	(4.42)	(4.46)
Nov	0.90	1.84	2.30	-2.99	-0.12
	(3.15)	(2.49)	(1.78)	(3.79)	(3.86)
Dec	-0.29	0.66	1.35	-3.92	-1.52
	(4.22)	(3.62)	(2.83)	(4.71)	(4.75)

* Numbers in parenthesis are the standard errors

TABLE XXIX

DALLAS AVERAGE BASIS FOR MARKETING LOAN 2

Month	Contract Month Mar*	May*	Jul*	Oct*	Dec*
	(Cents per Pound)				
Jan	2.55	3.54	4.31	1.56	0.81
	(2.98)	(2.37)	(1.70)	(3.52)	(3.58)
Feb	0.49	1.49	2.57	-1.91	-2.81
	(2.79)	(2.29)	(1.69)	(3.23)	(3.28)
Mar	1.60	1.10	1.14	-2.74	-3.72
	(4.18)	(3.60)	(2.82)	(4.63)	(4.66)
Aug	6.63	7.88	8.54	3.29	5.12
	(2.84)	(2.26)	(1.62)	(3.37)	(3.42)
Sep	3.47	4.23	4.29	0.02	2.32
	(2.68)	(2.19)	(1.61)	(3.11)	(3.16)
Oct	1.96	3.00	3.55	-2.73	0.71
	(4.34)	(3.78)	(3.01)	(4.75)	(4.79)
Nov	0.92	2.04	2.76	-1.86	-0.26
	(3.03)	(2.39)	(1.70)	(3.65)	(3.72)
Dec	0.27	1.43	2.18	-1.98	-1.90
	(4.40)	(3.82)	(3.03)	(4.87)	(4.91)

* Numbers in parenthesis are the standard errors

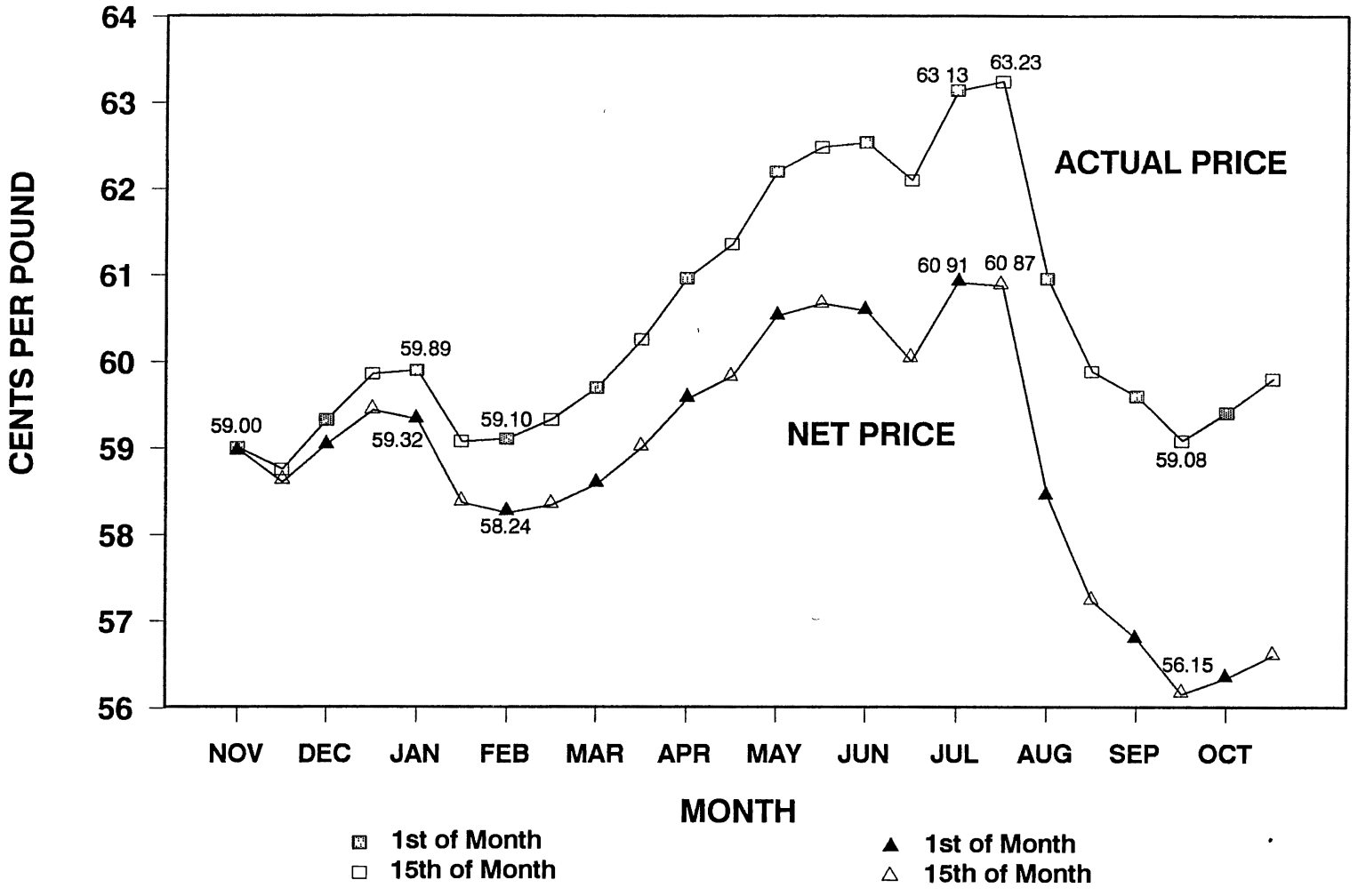

Figure 12. Dallas Actual and Net Cotton Price August 1, 1973 through November 30, 1990

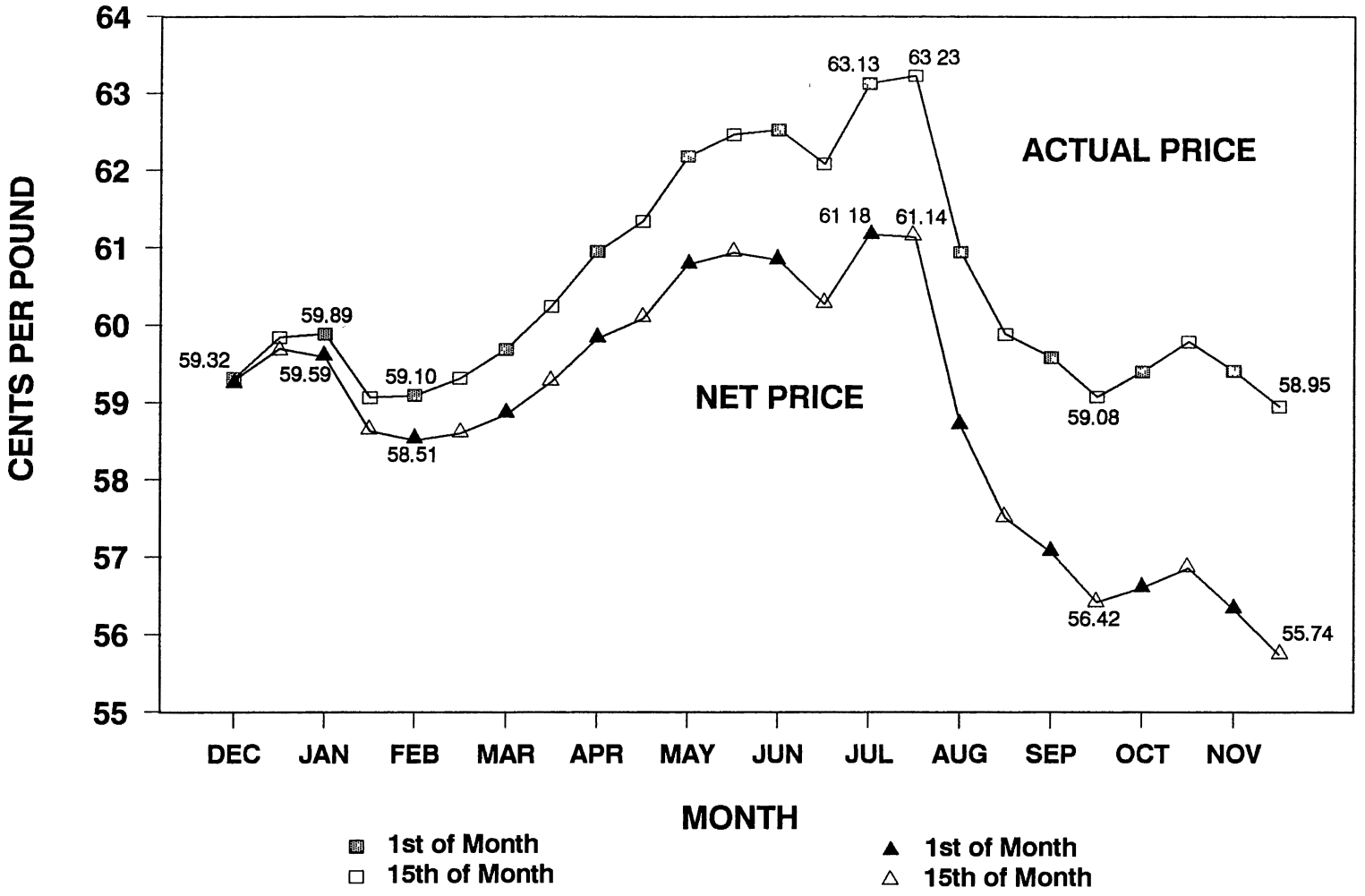

Figure 13. Dallas Actual and Net Cotton Price August 1, 1973 through November 30, 1990

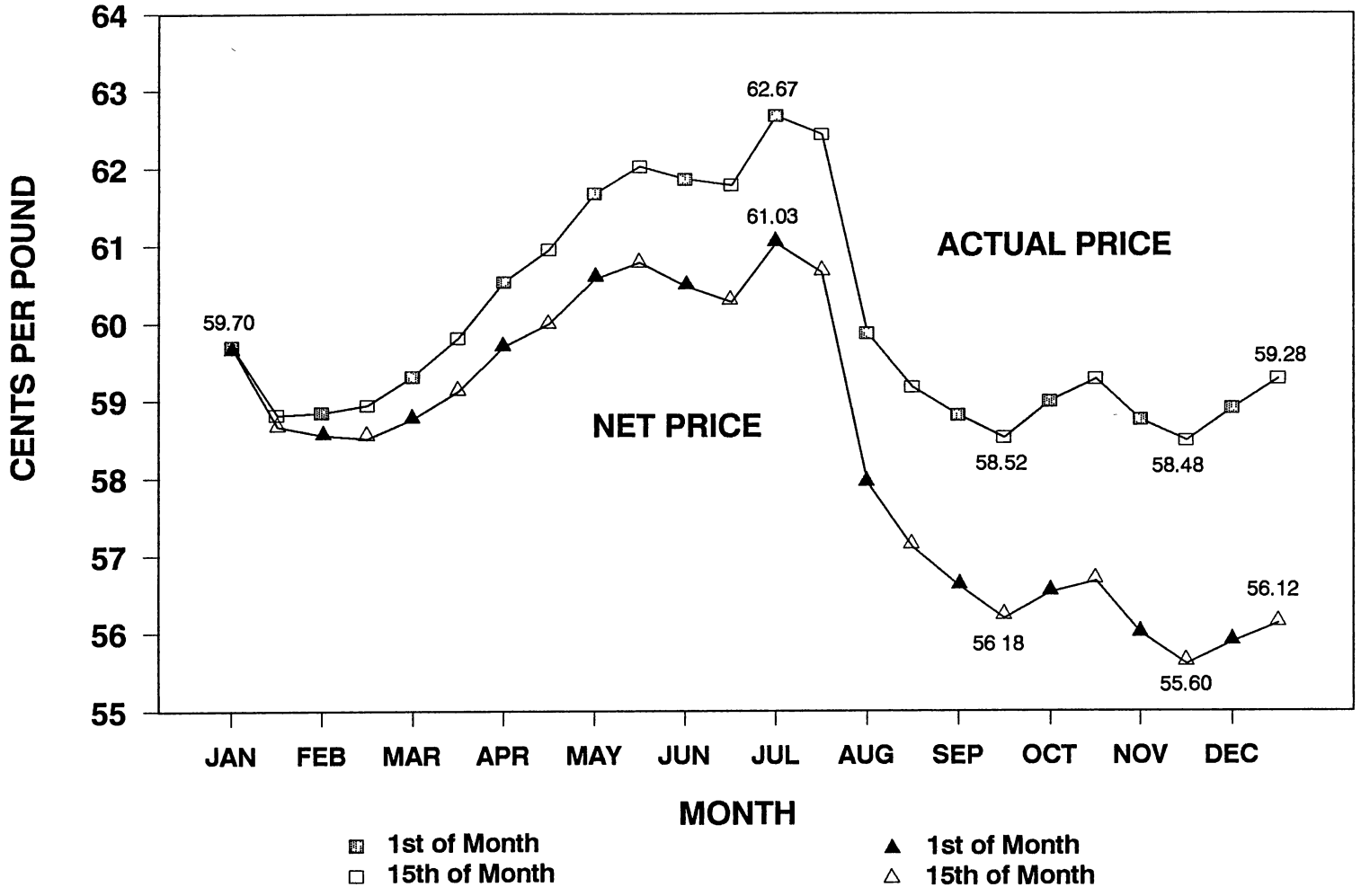

Figure 14. Dallas Actual and Net Cotton Price August 1, 1973 through November 30, 1990

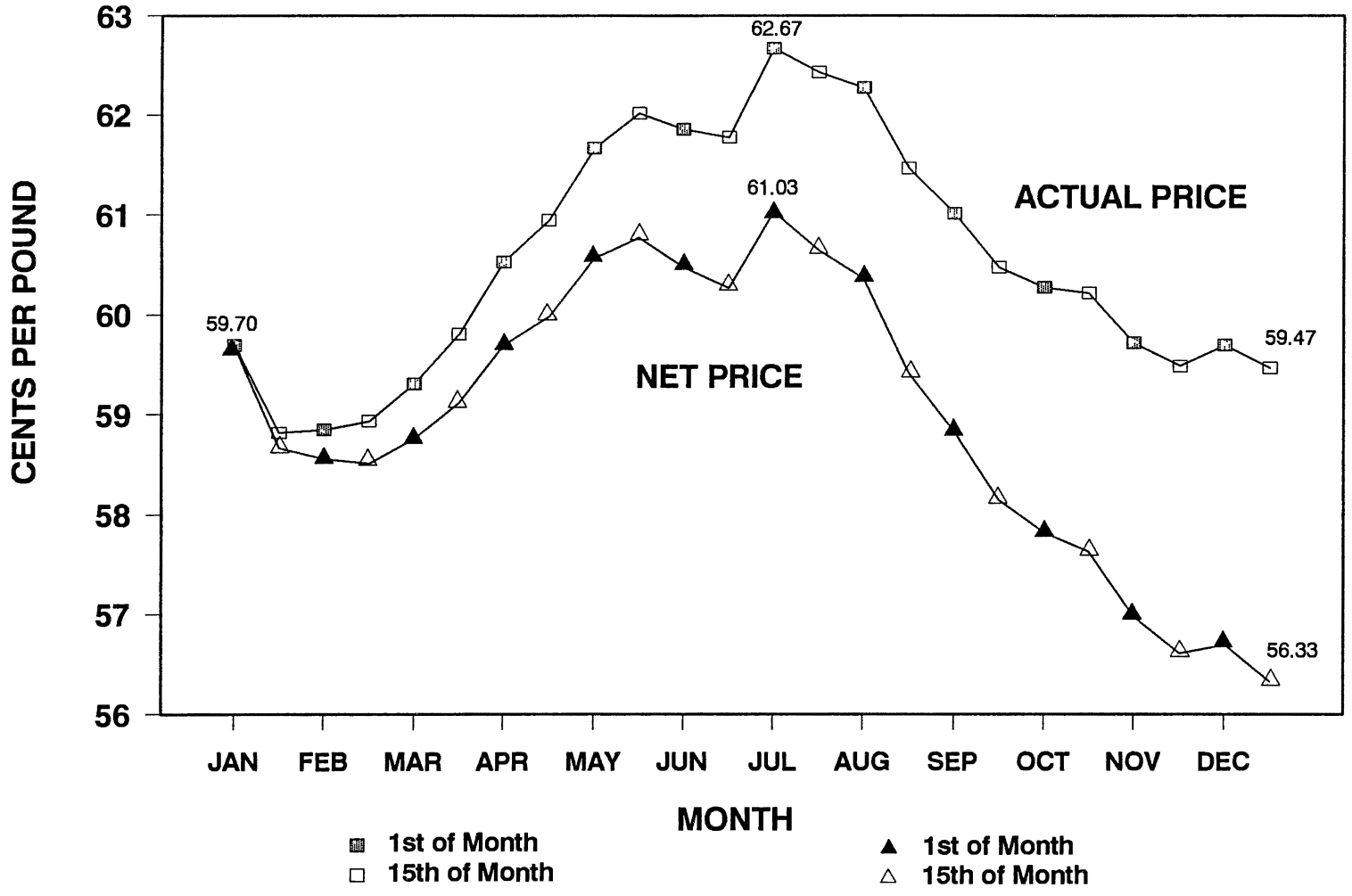

Figure 15. Dallas Actual and Net Cotton Price August 1, 1973 through November 30, 1990 Minus August 1 through December 31, 1986

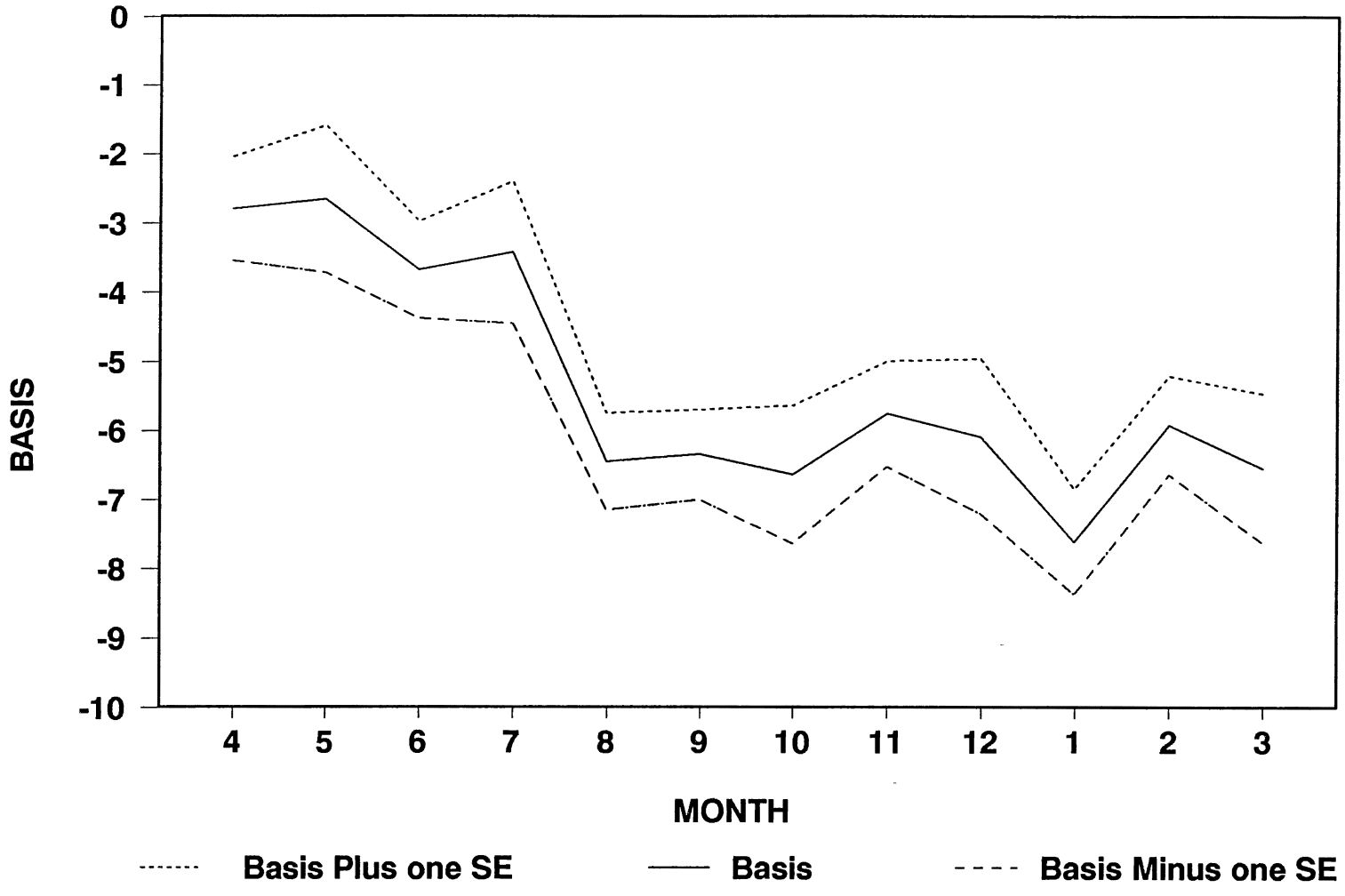

Figure 16. Dallas March Basis Plus and Minus One Standard Error

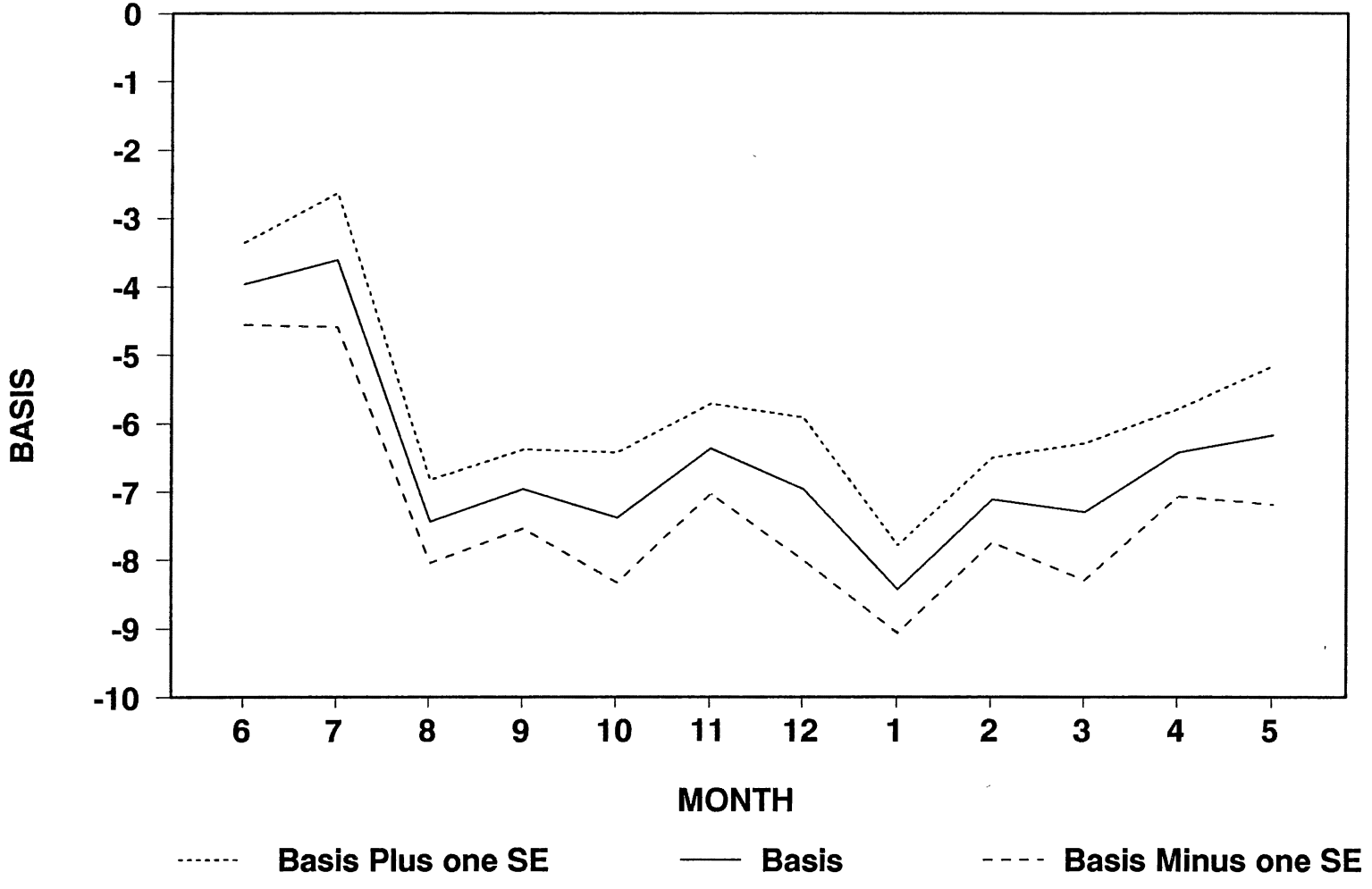

Figure 17. Dallas May Contract Basis Plus and Minus One Standard Error

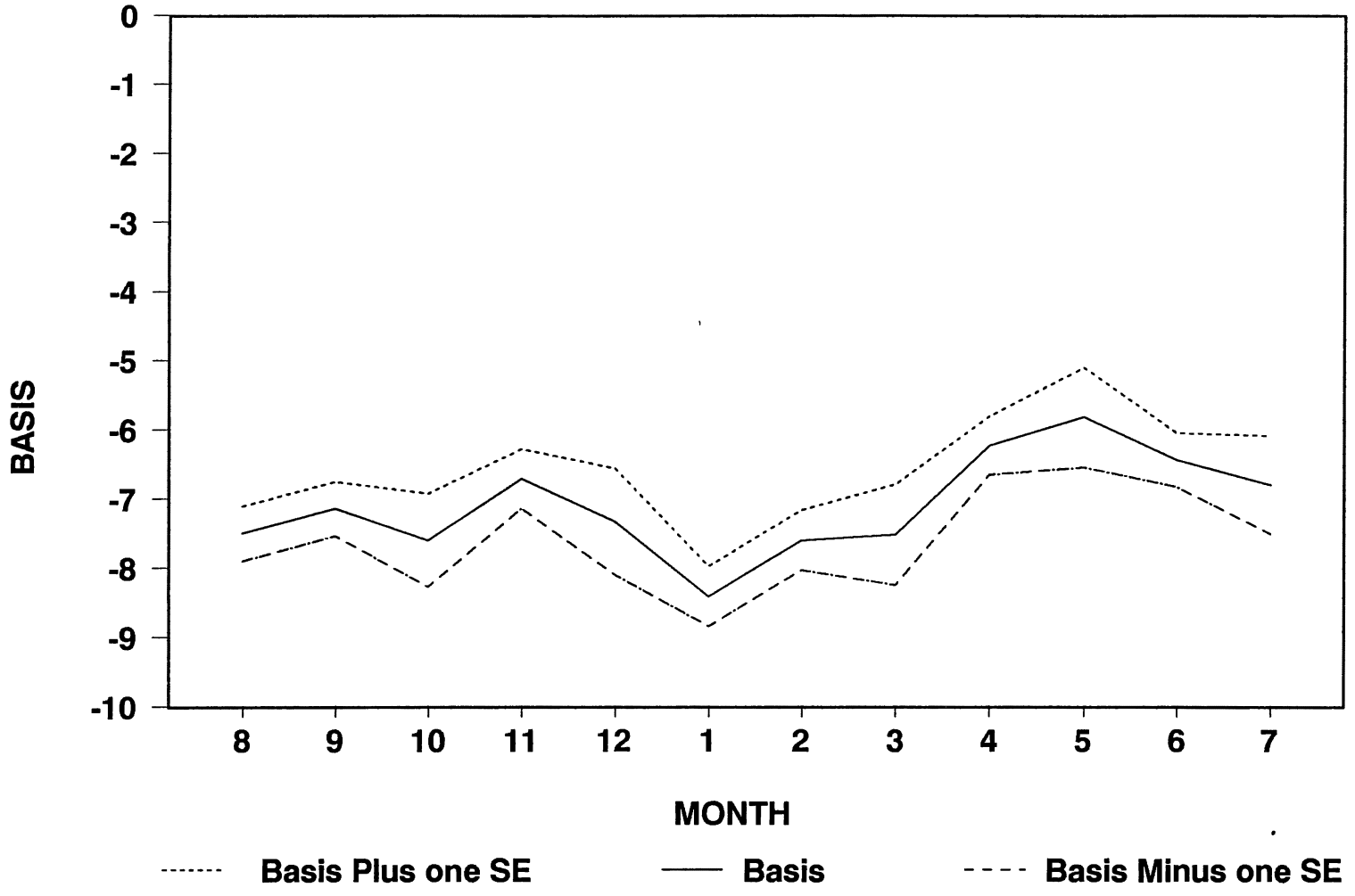

Figure 18. Dallas July Basis Plus and Minus One Standard Error

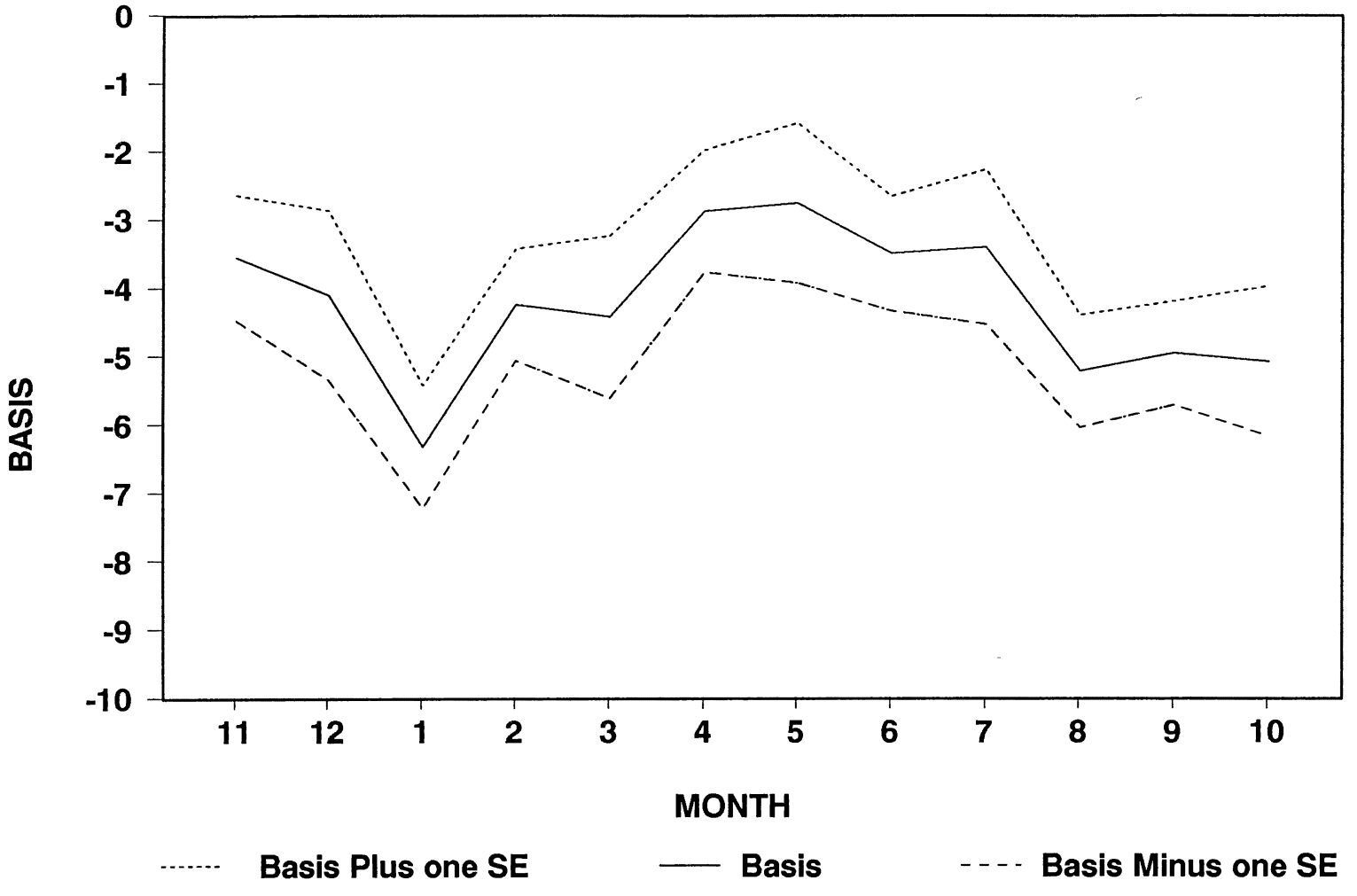

Figure 19. Dallas October Basis Plus and Minus One Standard Error

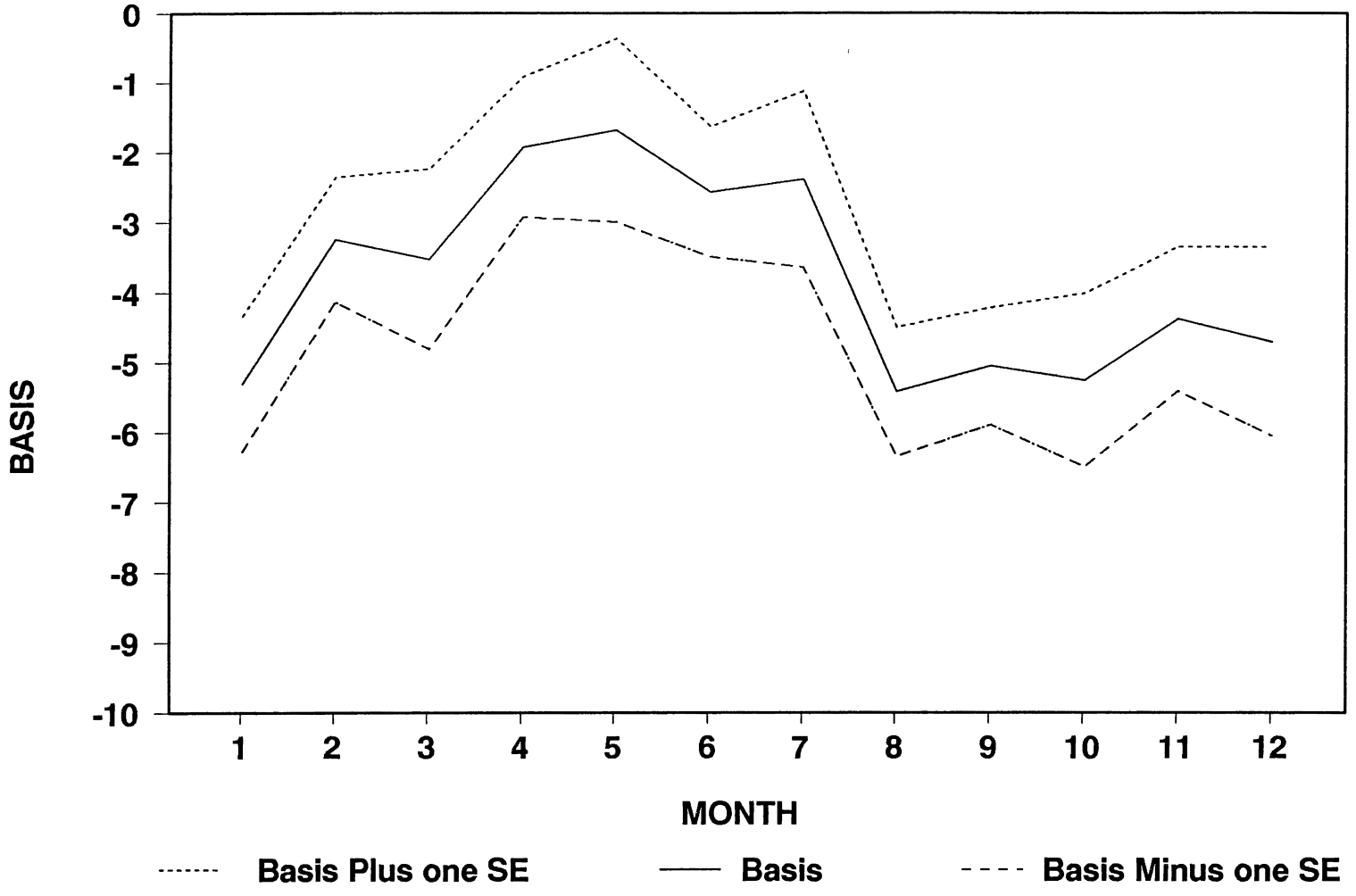

Figure 20. Dallas December Contract Basis Plus and Minus One Standard Error

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