COTTON PRICE RISK AND SLEEPLESS NIGHTS

Kim Anderson, Roger Sahs, and Phil Kenkel
Agricultural Economists
Oklahoma State University
Stillwater, OK

Abstract

Producers who do not use futures or options contracts sometimes feel that they are leaving thousands of dollars on the table. If they sell their cotton, they worry that prices will increase. If they do not sell their cotton, they worry that prices will decline. The research reported in this paper shows that simple cash marketing strategies will allow producers to sell their cotton with the confidence that, over a 10 year period, they will receive an above average price.

Introduction

POP, puts, calls, short hedges, long hedges, spreads, and pools are just a few cotton marketing tools. Marketing has become so complicated that producers often get frustrated. Marketing does not have to be frustrating. There are no reasons to loose sleep over marketing decisions.

There are many ways to sell cotton. Simple methods include using marketing pools, forward contracts, or just selling on the cash market one or two times each year. More difficult methods include using futures contracts, option contracts, or combinations of cash sells, forward contracts, futures contracts, and option contracts. Marketing cotton may be as simple or as complex as a producer wants to make it.

Most marketing decisions are based on price expectations. If prices are expected to increase, the cotton is held for later sale. With lower price expectations, the cotton is sold. Problems arise when cotton price outlook is uncertain.

This paper addresses the problem of selling cotton and not having to worry about changing prices. Strategies were developed that will help cotton producers have the opportunity to obtain the highest net price while reducing the risk of being stuck with the lowest price. Marketing strategies that are recommended do not depend on someone's ability to predict prices. Much like producing cotton, selling cotton is reduced to mechanical steps.

Marketing strategies can not be selected without considering risk. Risk is personal. Different people view risk different ways. Some can afford to loose more than others. Some have the cash position to wait for higher prices. Some can take more risk and sleep at night. Some

have to have the opportunity to sell at the highest price. To these, obtaining the highest price is as or more important than having to take a low price.

In this paper, risk may be defined as:

1. selling cotton when prices are a specified amount below the average annual price,
2. not having the opportunity to sell cotton when the market peaks, or
3. both selling at a specified level below the average annual price and not having the opportunity to sell cotton at the highest annual price.

West Texas and Memphis, Tennessee daily cash price data were obtained for the December 1982 through October 1993 time period. This 11 years of data was selected because these prices reflected existing market conditions and they provide enough observations to analyze market strategies.

New York Cotton futures prices were also collected. Futures contract prices and cash prices were combined to examine cotton basis and basis patterns. Both cash prices and futures contract prices were examined. No useful relationships were discovered from the basis and futures contract price data that could be used to develop simple marketing strategies.

Actual storage and interest costs were also collected. Storage costs, obtained from Oklahoma Cotton Cooperative Association Compress, Altus, averaged 0.79¢ per pound per month or $3.79 per bale per month.

Procedures

Cash and futures prices and basis patterns were determined by plotting, calculating averages and standard deviations, and by calculating changes. Daily cash and futures prices, and basis were plotted. The plots were used to examine price patterns and trends.

Next, average daily price and basis changes were calculated. Changes were determined for 1, 2, 3, 4, and 5 days. These changes showed the potential risk in holding cotton for short periods of time. The daily changes were then averaged for each month.

The last step was to calculate monthly average prices. The averages were used to determine average price changes from harvest. Average price changes were calculated using a single basis month (December or January) and from one month to the next (January minus December, February minus January, etc.).

Standard deviations were calculated for daily prices and basis. The standard deviations were used to determine the risk associated with different strategies.

Minimum and maximum prices and basis were also determined. These values show the best and worst outcomes from each marketing strategy.

All data, plots, and analysis were used to develop simple marketing strategies. The goal was to develop strategies that minimize downside price risk while allowing the opportunity to obtain an above average cotton price.

Results

The cotton market is basically efficient. Prices are determined by expectations. This means that seldom does the cotton market offer a price that is out-of-line with known conditions. The only time unreasonably low or high prices would be offered would be if major traders and/or merchandisers were unaware of actual conditions.

Price averages, trends, and standard deviations show that cotton has a strong seasonal trend (Figure 1 and Table 1). This is best shown by examining average prices for the first business day of the month and the first business day after the fifteenth of each month for an eleven year period. For example, the average price for the first business day in May from May 1983 through May 1993 was $63.08 per cwt. The average price for the first business day after May 15 from May 1983 through May 1993 was $64.71. Both actual average prices and actual prices minus storage and interest costs were calculated.

The highest average price occurred on the first business day in June ($64.78). But there is not 0.25 cents per pound difference between the average prices occurring between May 15 and July 1. Actual prices show a strong upward trend into May and June.

Subtracting storage and interest costs (net price) did not change this pattern. The highest average net price occurred on May 15 ($60.46). This implies that if a producer's marketing strategy is to sell during the same period each year, the single best time is to sell is between May 15 and June 1.

Average prices for the first business day on or after the first or fifteenth day of each month show the time period(s) best for selling cotton. What these averages do not show are the risks or opportunities given up if cotton is sold every year in the May/June time period.

Risk and opportunities may be evaluated by reviewing monthly average prices, the variability of these averages, minimum prices, and maximum prices (Tables 2 and 3). Monthly average prices by year for the years December 1982 through October 1993, monthly average prices for each month, and the standard deviation of prices by month are shown in Table 2. These

values are useful in evaluating price trends, averages, and minimums, and maximums. The frequency of high or low prices may also be determined.

Table 3 is a summary of the prices in Table 2. These prices are monthly average prices adjusted for storage and interest costs and arranged to allow easy evaluation of trends and the development of mechanical marketing strategies.

Monthly average cotton prices were adjusted for storage and interest costs and rounded off to the nearest whole cent. Storage and interest costs averaged about 0.8 cents per pound per month. For example, the average June price for the 11-year period was 64.71 cents per pound. After adjusting for storage and interest cost, the net price shown in Table 2 is 60 cents per pound and the price shown in Table 3 is 60.04 cents per pound.

Examining monthly average prices, by year, show that during the 11-year period between December 1982 and July 1993, only in 1988 (December 1987 and winter/spring 1988) was the December price (60.28¢) higher than the May (58.10¢)/June (58.55¢) average price (Prices not shown in tables). Not once were May prices lower than January prices. Price increases were not always enough to cover storage and interest costs. But, risks in holding cotton until mid-May were minimal.

For the remaining analysis, all marketing activities are assumed to be made between December and July. Thus, all cotton is assumed to be sold between December 1 and July 31 of each year.

Average monthly prices (next to last column in Table 2 and the fourth column in Table 3) show that the single best month to sell cotton has been May (74.36¢). The month with the lowest average price was January (66.66¢). Thus, if the marketing strategy was to sell cotton during the month with the highest average price, May would be the month of choice.

This is consistent with the average prices calculated for the first and fifteenth of each month (Table 1). Combining the information gleaned from Tables 1 and 3, cotton would be sold in the last-half of May.

Risk in selling cotton during May every year may be evaluated by examining the average price minus one standard deviation and the minimum price. The standard deviation is a measure of variability. A price range created by subtracting one standard deviation from the average and adding one standard deviation should contain ⅔ of the cotton prices from that month.

For example, the average monthly December price was 58.28 cents per pound, and the standard deviation was 6.05 cents. The range created by subtracting one standard deviation from the 58.28 cents and adding one standard deviation is 52.51 cents to 64.04 cents per pound. For the period December 1982 through December 1992, ⅔ of the December cotton prices were within this range.

Subtracting one-standard deviation from the average also indicates the amount of price risk. The lower the price, the more risk associated with holding wheat into that month. For example, the month with the highest amount of price risk is February (50.71¢). The month with the least amount of price risk was June (53.52¢). This indicates that the risk is lower for obtaining a "low" cotton price in June than in any other month.

Using standard deviations to determine the risk involved in selling cotton during a specific month indicates that the highest price risk is in March and April. And that the months with the least amount of price risks were May, June, and July.

Most cotton producers want to avoid selling cotton at the lowest price during the marketing period. The "Minimum Price" column shows the lowest net price that occurred in each of the months December through July. The lowest net prices occurred in February, 1992 (48.90¢) and March, 1992 (48.94¢).

This supports the conclusion that cotton prices have a tendency to bottom out in the February to March time period. A conclusion that could be made is that cotton should not be sold in the February to March time period. The lowest price occurred in these months. And February and March have relatively high price variability.

This data also supports the conclusion that the risk of selling cotton at the market low may be minimized by selling during December (51.05¢), January (51.18¢), May (50.81¢), and June (51.26¢). The highest minimum net price was June's 51.26 cents per pound.

Some cotton producers are not only concerned with the risk of low prices but are also concerned with the risk of not having the opportunity to sell cotton at the highest price. The highest price that occurred in each of the months, December through July, are shown in the "Maximum Price" column (Table 3).

The single highest net price occurred in May 1991 (74.36¢). The lowest monthly high price occurred in January 1984 (66.66¢). March and April's highest prices were above all highs except the May maximum.

This implies that producers who want to develop a marketing strategy that gives them the opportunity to sell at the market high should sell in May. This conclusion should be tempered with information that shows the month where the highest net price occurred (Table 2).

During the marketing periods December through July, monthly average net prices were the highest three times each in June and July, twice in April and once in December, March, and May. The highest net price never occurred in January or February. If cotton is not sold until after January 1, then the highest net priced occurred once in January.

Producers who want to obtain the highest prices each year should consider marketing strategies that include selling cotton in the April through July time periods.

Marketing Strategies

Marketing strategies may be divided into two categories: 1) marketing strategies for producers who enjoy marketing and spend as much time marketing cotton as they do producing cotton; and 2) strategies for producers who want to do a good job of marketing without becoming a merchandiser. The following strategies are for producers who want to have a good marketing program but do not have the time necessary to be a merchandiser.

The simplest marketing strategy would be to sell cotton between May 15 and June 1 each year. This strategy has minimum risk compared to other single time period strategies. It also produced the highest average net price, the highest maximum price, and the highest range based on the standard deviation. If cotton had been sold on May 15 every year since December 1982, the average net price received would have been 60.46 cents per pound.

A marketing strategy that would not have yielded as high an average price, but year after year producers tend to be more comfortable using is to stagger the cotton sells. This may be to sell in lots of ½, ⅓, or ¼ of the cotton in storage. A example of this strategy would be to sell ⅓ in mid-May, ⅓ in early June, and the final ⅓ in early July. Following this strategy for the 11-year period between December 1982 and July 1993 would have yielded an average net price of 59.91 cents per pound.

Staggering cotton over a designated period produces a lower net price. But, producers normally are more comfortable with this strategy, because if prices are higher in the June/July period they have cotton to sell. If prices go down, they sold some cotton at the higher May price.

Government program policies will impact the marketing strategies. Past producer option payments (POP) occurred early in the marketing year. If the POP is not available, a producer may place cotton in the government loan until prices increase. This provides money to meet financial obligations until the cotton is sold.

The price information presented above indicates that the POP payment could have been used to increase the net price received. This is the case because every year the POP was available, the cotton price increased more than the storage and interest cost. To take advantage of the POP payment, the producer has to be in the financial position to not need the proceeds from selling the cotton crop.

For example, on December 15, 1988 there was a 4.5 cent per pound POP payment available. The highest net cotton price available between December and the last of July was about 57 cents per pound. Producers could have taken the 4.5 cent POP payment in December and the 57 cent net price in July. The combined net price would have been 61.5 cents per pound, 4.5 cents higher than if no POP had been available.

Conclusions

Producers do not have to lose sleep over cotton marketing decisions. The research reported in this paper indicates that simple cash marketing strategies can be developed that do not depend on price outlook yet yield an above average net price.

Cotton prices have a strong seasonal trend. Assuming that storage and interest costs start in December, over the 11-year study period, net prices increased every year except one. If January was the first month the cotton was available for marketing, the price increased in all 11-years.

The results were reported for west Texas and southwestern Oklahoma. The analysis was also conducted for the Memphis market. Price seasonality, trends, and relationships were stronger for the Memphis market than for the west Texas market.

Figure 1. West Texas Actual and Net Average Cotton Price
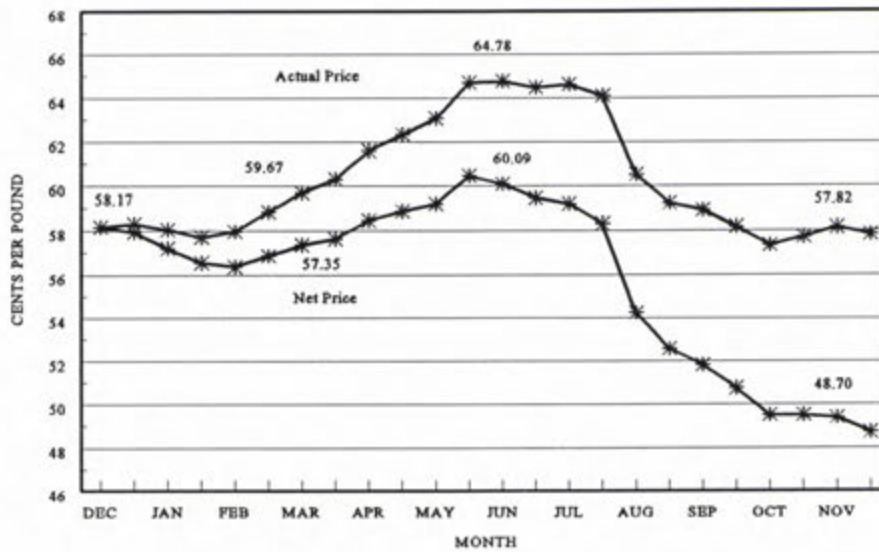December 1, 1982 through October 31, 1993

Table 1. West Texas Average Actual and Net Prices for the First Business Day after the First and Fifteenth of Each Month: December 1982 through November 1993.[1]

		Actual Average Price	Average Net Price
DEC	1	58.17	58.17
	15	58.30	57.94
JAN	1	58.04	57.20
	15	57.71	56.55
FEB	1	57.96	56.37
	15	58.83	56.86
MAR	1	59.67	57.35
	15	60.30	57.62
APR	1	61.60	58.46
	15	62.35	58.87
MAY	1	63.08	59.18
	15	64.71	60.46
JUN	1	64.78	60.09
	15	64.50	59.45
JUL	1	64.64	59.17
	15	64.12	58.30
AUG	1	60.50	54.24
	15	59.20	52.58
SEP	1	58.89	51.81
	15	58.16	50.73
OCT	1	57.33	49.50
	15	57.70	49.50
NOV	1	58.12	49.37
	15	57.82	48.70

[1]Storage and interest costs averaged about 0.8¢/pound/month or $3.82/480# bale/month.

Table 2.   Average Monthly Net Lubbock Cotton Price, January 1983 - October 1993

Year	83	84	85	86	87	88	89	90	91	92	93	AVG	STD DEV
						(Cents/pounds)							
Dec-p¹	58	71	58	56	53	60	53	63	65	53	51	58	6
Jan	57	67	55	56	55	56	54	61	65	51	52	57	5
Feb	58	66	54	58	53	54	52	62	71	49	53	57	6
Mar	59	69	54	59	52	55	53	64	72	49	54	58	7
Apr	61	69	57	59	54	55	56	65	72	50	53	59	7
May	61	71	56	58	61	55	57	65	74	51	53	60	7
Jun	62	68	54	61	65	55	57	65	70	52	51	60	6
Jul	61	60	54	60	65	52	59	69	62	56	50	59	5
Aug	64	55	51	20	68	47	60	66	56	51	49	53	13
Sep	63	53	47	24	66	42	59	61	53	46	47	51	11
Oct	60	51	47	34	58	42	59	59	50	42	47	50	8
Nov	61	49	47	35	55	43	59	57	46	41		49	8

¹Dec-p is the December in the previous year.

Table 3.   Average Monthly Lubbock, Texas Cotton Prices Adjusted for Storage and Interest: Dec 1982 - July 1993

Month	Minimum Price	Minus Std Dev	Average Price	Plus Std Dev	Maximum Price
			(Cents/pound)		
Dec	51.05	52.51	58.28	64.04	70.77
Jan	51.18	52.39	57.19	61.98	66.66
Feb	48.90	50.71	57.33	63.95	71.30
Mar	48.94	50.80	58.05	65.30	72.15
Apr	50.07	52.22	59.19	66.16	72.19
May	50.81	52.82	60.25	67.68	74.36
Jun	51.26	53.52	60.04	66.56	69.70
Jul	49.60	53.00	58.68	64.36	68.87