6-8-1989

Forward Pricing Grain While Maintaining the Potential to Benefit From Price Increases

Brian H. Schmiesing
South Dakota State University

ECONOMICS COMMENTATOR

SDSU

SOUTH DAKOTA STATE UNIVERSITY
No.273 June 8, 1989

FORWARD PRICING GRAIN WHILE MAINTAINING THE POTENTIAL TO BENEFIT FROM PRICE INCREASES

Brian H. Schmiesing
Agribusiness Management
and
Grain Marketing Researcher

Nine-month nonrecourse loans through the Commodity Credit Corporation establish basement prices for the producer's grains and still permit the producer to obtain higher revenues resulting from a price increase. However, support loan prices for grains were lowered significantly in the Food Security Act of 1985.

One possible goal in a producer's marketing plan may be to establish a basement price higher than what is available through the government program. However, a producer may still want to maintain the potential to obtain higher revenues if prices increase.

In this article, the author discusses two option-based alternatives to establish a basement price for corn and still maintain the ability to benefit from upward price trends. The first alternative is the purchase of a put option. The second is using a forward pricing contract with an "Act-of-God" clause and the purchase of a call option. A major difference between the two alternatives is the net revenue earned if a production shortfall should occur.

Description of the Two Alternatives

A put option provides an option buyer the right to sell a futures contract at a specified price. Because a sales price is specified in the option, the producer is indirectly enabled to establish a basement price for his/her production.

For producers not desiring to directly use put options, minimum pricing contracts can be used. These contracts are available through local elevators. The advantages of a minimum pricing contract are flexibility in the amount contracted and the producer not having to become directly involved in the options market. Unlike a put option, a minimum pricing contract can be for amounts smaller than 5,000 bu. However, a producer is confronted with potential cancellation penalties if prices increase and he/she is unable to deliver the commodity.

A second alternative is to (1) use a forward pricing contract that contains an Act-of-God clause and (2) purchase a call option. As discussed in the April 4, 1989 **Economics Commentator**, an Act-of-God clause allows producers to avoid cancellation penalties if their production is less than the level forward contracted. The Act-of-God clause contract used in the example is based on the Crop-Sure program of Harvest States Cooperatives. A call option provides the option buyer the right to buy a futures contract at a specific price and profit if the contract price rises.

Forecasted Cash Price

Assume we have a producer that wants to evaluate the feasibility of forward contracting 5,000 bu of corn for November delivery. May 1, 1989 closing prices for the futures and options contracts are used in the examples.

The producer's forecasted local cash price equals the futures contract adjusted for the **expected** basis in November. On May 1 the closing price for the Chicago Board of Trade (CBT) December corn futures contract was $2.54. The producer expects the local basis to be - 50 cents in November, i.e., the cash price is "50" cents under the futures contract price. The local cash price would be $2.04.

December futures contract price	$2.54
Adjustment for the expected November basis	- .50
Forecasted local cash price	$2.04
Minus loan support price	1.57
Difference	$ .47

Whether the private market would provide a price superior to that in the government program is determined by comparing the forecasted price to the loan support price. The 1989 loan support price for corn at an east-central South Dakota location will be approximately $1.57. If the producer's forecast of the local cash price actually occurs, this price will be 47 cents higher than the government loan rate.

If the producer forward contracts at a local elevator, three disadvantages exist. First, the producer may have a production shortfall and be unable to deliver the amount specified in the forward pricing contract. If the corn price increases, the production shortfall will result in the producer paying a cancellation penalty.

Second, if cash corn prices increase after forward contracting, the size of the government deficiency payment will decline. This statement assumes the national cash corn price is greater than the national support price. Government deficiency payments are then equal to the target price minus the national cash price. Because a forward pricing contract establishes a fixed price, the decreases in government deficiency payments will not be offset by the increased cash prices for the producer's production.

Third, when a producer forward contracts with an elevator, the producer must pay the elevator for managing the price risk associated with the forward contract. This will result in the forward contracting price being lower than the expected cash price. The size of this difference is based on the elevator's own expectations concerning the basis, commissions, expected margin expenses, and desired profit level.

To avoid these disadvantages, a producer may want to directly purchase a put option. As will become evident, this approach also has some disadvantages.

Alternative #1: Purchase a Put Option

A put option is a right to sell a particular futures contract at a specific strike price. The price paid for a put is a premium. The premium is inversely related to changes in the futures contract price. The higher the futures price the lower the premium for a put and vice versa.

Assume on May 1 the producer purchased a put option with a strike price of $2.70 for a premium of 35 cents. Three possible price scenarios that could exist for the December futures contract in November are (1) price stays constant at $2.54, (2) price increases 46 cents to $3.00, and (3) price decreases 46 cents to $2.08.

December contract price	$2.54	$3.00	$2.08
Adjusted for basis	-.50	-.50	-.50
November cash price	$2.04	$2.50	$1.58
Sell put option	.16	.00	.62
Buy put option	-.35	-.35	-.35
Minus commissions	-.02	-.02	-.02
Profit or loss on put option	-.21	-.37	.25
Net price received	$1.83	$2.13	$1.83

The net price received by the producer is equal to the cash price adjusted for the profit or loss associated with the put option and commissions. The profit or loss associated with the put is equal to the premium received when the option is sold minus the the premium paid for the option. How option premiums are determined is beyond the scope of this article. The principal concept is that a profit in a put option trade will be made if the futures contract price drops significantly.

As can be seen, the put option strategy has a basement price of $1.83. If the futures price increases to $3.00, however, the producer would receive a net price of $2.13 per bushel.

Alternative 2: Crop-Sure and Purchase of Call Option

A second alternative is to use a forward contract with an Act-of-God clause combined with the purchase of a call option. The forward contract price will equal the current December contract price adjusted for the basis minus the Crop-Sure deduction. Assume the elevator deducts 55 cents for the expected basis and charges for forward contracting. A deduction of 10 cents is charged for CROP-SURE. The forward contract price is equal to $1.89 ($2.54 - .55 - .10).

December contract price in November	$2.54	$3.00	$2.08
Forward contract price	$1.89	$1.89	$1.89
Sell call option	.00	.30	.00
Buy call option	-.09	-.09	-.09
Commissions	-.02	-.02	-.02
Profit or loss on call option	-.11	.19	-.11
Net price received	$1.78	$2.08	$1.78

The producer is assumed to buy a CBT corn call option with a strike price of $2.70 for a 9 cent premium. Just like the put option, the profit or loss of the call option trading is equal to the premium that the call is sold for minus the premium paid when the call is purchased. Unlike put option trading, call option trading is profitable if the futures contract price increases.

The net price received by the producer is equal to the forward contract price adjusted for the profit or loss from trading the call option. Again a basement price is established for the producer and the producer is able to receive higher prices if the futures contract price increases. The basement net price is $1.78.

A Significant Difference

Although both strategies result in a basement price higher than the support loan price of $1.57, the put option strategy tends to provide the producer a slightly higher price in the different price scenarios for the futures contract price.

The above analysis assumed that the producer's farm actually produces 5,000 bu of corn. What would happen to the net price received per bushel produced if the producer was able to deliver only 2,500 bu rather than 5,000 bu? (See Alternatives #1 and #2.)

With a production shortfall, Crop-Sure with the purchase of a call option can result in a greater net revenue per bushel to the producer than with the put option. The price received per bushel produced is higher in two of these scenarios. One advantage of this approach is the ability to participate in arbitrage in the cash market to meet the bushel delivery requirements of the forward contract.

If the forward contract price is higher than the local cash price, a producer can purchase grain from another producer and sell to the elevator at a profit. For example, a futures price of $2.08 implies a local cash price of $1.58 (-50 cent basis). A farmer could buy corn from a neighbor at $1.58 to deliver to the elevator. The profit would be 31 cents or $1.89 minus $1.58. The value of this arbitrage would be 31 cents times 2,500 bu or $775.

The competitiveness of the Crop-Sure alternative relative to the put alternative could be adversely affected by a number of factors. A higher deduction for Crop-Sure will reduce the profitability. The deduction for Crop-Sure is directly related to the production risk in a region and price volatility of the futures markets. Both these factors imply also greater risks for producers using other marketing alternatives.

A second factor is the relationship between the expected cash price and the forward contract price. In the above example, the difference between the expected cash price and the forward contract price was assumed to be 15 cents. A larger difference will decrease the attractiveness of Crop-Sure relative to a put option.

Conclusion

Production risk is all too frequently ignored in discussions of marketing alternatives. When using any marketing alternative or government program, the producer should analyze what the returns would be if a crop failure occurs. Effective risk management

---

Alternative #1: Purchase of Put Option

December contract price in November	$2.54	$3.00	$2.08
November cash price	$2.04	$2.50	$1.58
Multiplied by bushels sold	2,500	2,500	2,500
Revenues from cash sale	$5,100	$6,250	$3,950
Profit or loss on put option	-.21	-.37	.25
Multiplied by 5,000 bu.	5,000	5,000	5,000
Total profit or loss on put	-$1,050	-$1,850	$1,250
Combined Revenues	$4,050	$4,400	$5,200
Price per bushel produced	$1.62	$1.76	$2.08

Alternative #2: Crop-Sure and purchase of call option

December contract price in November	$2.54	$3.00	$2.08
Forward contract price	$1.89	$1.89	$1.89
Multiplied by 2,500 bu.	2,500	2,500	2,500
Revenues from forward contract	$4,725	$4,725	$4,725
Profit or loss on call option	-.11	.19	-.11
Multiplied by 5,000 bu.	5,000	5,000	5,000
Total profit or loss on put	-$ 550	$ 950	-$ 550
Plus cash arbitrage profit	0	0	$ 775
Combined Revenues	$4,175	$5,675	$4,950
Price per bushel produced	$1.67	$2.27	$1.98

SOUTH DAKOTA STATE UNIVERSITY
Economics Department
Box 504A
Brookings, SD 57007

Non-Profit Org.
U. S. Postage
PAID
Brookings, S. D.
Permit 24

Address Correction Requested

requires the manager to know and understand the returns under different price and yield scenarios.

The problem with using put options to ensure a basement price is that the premium for a put option is inversely related to the price of the commodity. The higher the commodity price the lower the option premium. But higher prices are frequently associated the crop failures, which implies a producer can suffer losses on the put option trade, and revenue losses because of decreased production levels.

Just because one producer has a crop failure does not imply all producers are going to have a crop failure. However, a reasonable expectation is that crop failures for individual producers will tend to be associated with general crop failures. Therefore, the desired strategy is one which will result in increased -- rather than less -- revenues from higher commodity prices. A strategy of combining a forward contract with an Act-of-God clause with the purchase of a call option can provide such possibilities.

ECONOMICS
COMMENTATOR

EDITOR: Donald C. Taylor, Agricultural Economist

ECONOMICS DEPARTMENT
South Dakota State University
Box 504A
Brookings, SD 57007
Phone: (605) 688 - 4141