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Options on Beans For People Who Don't Know Beans About Options

Remember when things were simple? When a call was something you got when you were in the bathtub? When premium was what you put in your car? When exercise was advice from your doctor, not your broker? Hedging with futures contracts isn't always an easy process to explain, but at least you're feeling more comfortable now about your understanding of this marketing tool.

Along came 1982

Along came 1982 and with it came options on futures and the futures business became a little more complicated: Multiple ways to go long or short; hedging strategies designed to work in either direction; a whole new vocabulary to learn. In 1984, the Chicago Board of Trade (CBOT) introduced options on grain futures, giving producers, storers and processors the same opportunities that the financial community had previously experienced with options on U.S. Treasury bond futures. With all due respect to George Orwell, 1984 found Big Brother more concerned with "vertical spreads" than with the vertical hold on his monitor screens.

How can a marketing plan be improved using options?

Just what are agricultural options on futures and how do they differ from futures? How are they traded? Most importantly, how can a marketing plan be improved using options? These are some of the questions we will examine in this introduction to options on agricultural futures.

"Puts" and "Calls"

The buyer, or holder, of an option has the right, but not the obligation, to buy or sell an underlying commodity at a pre-determined price (the strike price) on or before a specific date (the expiration date). There are two kinds of options. "Call" options give the buyer, or holder, the right to buy the underlying commodity and "put" options give their holder the right to sell. In the case of soybean options, the rights conveyed are for one CBOT soybean futures contract (5,000 bushels).

The term "rights" points up the first difference between futures and options. With futures, an obligation is created for both the buyer and seller. One must take, and the other make, delivery

Trading futures, options and forex is speculative in nature and involves risk of loss. Traders can and do lose money.

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unless the position is offset. Options are a unilateral obligation on the part of the seller, that is, only the seller of the option contract is obligated to perform. The buyer may exercise his option, but may also decide to abandon it and let the option expire. This is true for both the buyer of call options as well as the buyer of put options. In the event the option buyer (holder) decides to exercise, the option seller must deliver the corresponding futures position. Once the seller has received notice of exercise, he cannot offset his option position. He must deliver.

In return for assuming the obligation, the seller of the option receives a premium from the buyer. The premium must be paid in full, in cash, when the option is purchased. So the buyer wants certain rights and pays for them. The seller agrees to grant those rights and is paid for his risk. Simple? Yes, but this payment represents much more.

To the seller, this premium is the maximum profit available to him in the trade. If the value of the option he sold short rises, he may have to deliver a futures position, or cover his short sale at a higher price, thus incurring a loss. If the value of the option decreases, the short sale is profitable, but the value can only decrease to zero, thus placing a limit on profits. Conversely, the buyer's profits increase as the value of the option he purchased increased. He may sell the option at the higher price, or demand delivery of a futures position. But his right to abandon the option limits his loss to the premium paid. Since the value of the option can only go to zero, the buyer can let it expire and forfeit his premium.

Staying Power

(Options possess a mechanism of defined risk)

This is perhaps the most salient difference between options and futures. With futures, both the buyer's and seller's risk theoretically is unlimited, and each party is in jeopardy should the market move against one's position. Options, on the other hand, possess a mechanism of defined risk. The premium paid (by the option buyer) represents the total amount the buyer has at risk. If he forfeits the premium, he has no further financial obligation. Because of this, the buyer will not have to put up any margin, or ever face any subsequent margin calls, regardless of where the underlying futures price moves during the life of the option. No matter how far the trade moves against his position, the buyer can hold the option in anticipation of an eventual turnaround in the market that would make his position profitable. This is why options are said to have "staying power" – the ability to withstand adverse market moves.

How Are Option Premiums Determined?

We have discussed what premium is in terms of payment for rights. But who determines how much this payment should be? Obviously, the marketplace is the ultimate determinant, since options are traded in an auction manner at a futures exchange, with bids and offers made by either open outcry or the exchange's electronic order matching screens. There are, however,

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some guidelines for determining the option premium. In fact, there are a number of option pricing models which mathematically calculate the theoretical value of an option. (The word theoretical must be stressed here. These mathematical values may or may not correspond to the actual market value in the pit.) Much has been written about these models and their effectiveness. For our purposes, though, we will look at two basic components of premium as they relate to the market:

$$\text{Premium} = \text{Intrinsic Value} + \text{Time Value}$$

Intrinsic Value

Intrinsic value is the amount an option would be worth if it were to expire immediately. For example, if soybean futures were trading at \$8.00/bushel and your call option gave you the right to buy soybean futures at \$7.50/bu., you would have an immediate \$.50/bu. profit and would be willing to pay \$.50/bu. for that option. A call option with a strike price less than the market price has intrinsic value and is said to be “in-the-money.”

A put option has intrinsic value and is “in-the-money” when its strike price is above the market. Using our \$8.00 soybean futures, the right to sell soybean futures at \$8.50 is worth an immediate \$.50/bu. profit, and this \$.50 is the intrinsic value of the put option.

A call option with a strike price above the current market price is said to be “out-of-the-money.” The right to buy soybean futures at \$8.50 when they can be had on the futures market for \$8.00/bu. is intrinsically worth nothing. But there maybe a processor or soybean crusher who wants to assure himself the right to buy soybean futures at \$8.50 in the event the market rallies sharply. So some value may be placed on this option. At the same time, there may be a producer who anticipates a sharp decline and wants to insure that he can sell soybean futures at \$7.50/bu. later even though they are \$8.00 now. When the strike price of a put is below the current market price it is also out-of-the-money. When the strike price of an option, put or call, is exactly at the current futures market price, it is said to be “at-the-money.” With soybean futures at \$8.00, an \$8.00 option still has no intrinsic value. But there is a high probability that it will gain intrinsic value, given that only a small move in the market would be needed.

$$\text{Intrinsic Value} + \text{Time Value} = \text{Premium}$$

“Time” Value

The second component that makes up the option premium is time value, and this is somewhat more difficult to quantify. It is based entirely on expectations of future price movement. By definition, it is that part of the premium that exceeds the intrinsic value, but this hardly seems complete. We can, however, look at some factors that help determine time value:

Time Remaining Until Expiration

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Volatility of the Underlying Commodity

In general, the more time until expiration, the greater the time value. Common sense would dictate that, all else being equal, the right to buy something is worth more if you have a year to decide instead of only six months. Conversely, your option is asking the seller to pre-price his product now without regard for events that may occur in the future. He must be paid for this risk, and a year's worth of risk costs more than six month's worth.

Volatility is probably the most obvious and least understood factor influencing option prices. While there are many mathematical explanations for volatility, let us again rely on common sense. If soybean futures are at \$8.00/bu. and will remain at that price for a year, there is little risk in selling an \$8.50 call option. But if soybean futures trade between \$7.25 and \$8.75 in the same week, there is significantly greater risk associated with that \$8.50 call option. Once again, the seller of the option must be paid for taking the risk the buyer requests. The greater the likelihood that the market will trade to the strike price and therefore increase the chances of delivery, the greater the premium must be to accommodate the risk taken by the seller.

Thus, we see that the common thread running through each of these components of time value is risk. Anything that increases risk will increase option premiums, regardless of which area contains the source of the risk. And anytime the amount of risk decreases in any component without a corresponding increase elsewhere, option premiums will fall.

Price Insurance with Options

To illustrate the usefulness of put options, let's assume that at the time a producer plants soybeans, the November futures price is quoted at \$6.50. One alternative is to hedge (lock in that price, less basis) by selling a November futures contract. Or he may be able to forward contract the sale at a firm price for local delivery at harvest. But he may be reluctant to do either because it would mean giving up the chance to profit from any summertime price increase (such as occurred in the summer of 2005).

Another alternative, when options are traded, will be to purchase a put option. Rather than commit to a firm selling price, the put will provide what amounts to price "insurance," that is, protection against a price decline without giving up the chance to sell at a higher price.

Here's how: If the producer buys a November/\$6.50 put and, by harvest, the November futures price has declined to, say, \$5.50, he can exercise his right to sell a November futures contract at the option strike price of \$6.50/bu. The \$1.00/bushel profit in the futures position acquired through exercise should roughly offset the cash market decline in the price of soybeans. Or he can obtain the same sum of money by having his broker sell the option for its \$1.00/bu. intrinsic value.

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Thus, buying a put option establishes only a price floor – not a price ceiling. If, at harvest, the November futures price has risen above the option's \$6.50 strike price, the producer can simply allow the option to expire (that is, not exercise the option and absorb the cost of the option premium) and sell his beans at the higher market price. Remember, while a put option gives the right to sell a futures contract, it doesn't obligate its holder to sell. The producer who holds a put option may elect to exercise it only if that is to his advantage.

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Reproduced with permission of the author, Jay Sorokin, a third-generation member of the Chicago Board of Trade. He currently teaches futures, options and option trading strategies at the Chicago Board of Trade and for Northwestern University's School of Continuing Education and privately for businesses throughout the United States.

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