

Commodity Challenge

Section III: Advanced Pricing Tools

Chapter 13: Options

Learning objectives

- The appeal of options
- Puts vs. calls
- Understanding premiums
- Recognizing if an option is in-the-money, at-the-money or out-of-the-money

Key terms

Call option: The right, but not the obligation, to buy futures contracts.

Put option: The right, but not the obligation, to sell futures contracts.

Premium: The price paid for an option.

Exercise: To execute the terms of the option.

Strike price: The price at which an options contract can be exercised.

Intrinsic value: The amount by which an option is in-the-money.

Time value: The portion of the premium not attributed to intrinsic value.

The Options Contract

An option gives the buyer the right-but not the obligation-to buy or sell a futures contract. Buyers of puts have the right to sell futures; buyers of calls have the right to buy futures. Sellers receive the premium but assume the obligation.

All terms except the premium are standardized. Minimum tick size is smaller than for futures.

The Appeal of Options

Options provide **protection with potential**:

- They protect against unfavorable price moves.
- They allow participation in favorable price moves.
- Option buyers never face margin calls.

This makes options attractive to hedgers who want downside protection without giving up upside potential.

Puts and Calls

An option is the right, but not the obligation, to buy or sell a futures contract at some predetermined price at any time within a specified time. There are two types of options; puts and calls.

A call option is the right to buy futures contracts. Recall the long hedge - the purchase of futures contracts against cash sales or to lock-in input costs. The long hedge alternative with options is the purchase of call options – the right to buy futures. Call options as a hedge are used to establish a maximum price, while retaining the ability to benefit from decreasing prices.

A put option is the right to sell futures. With futures, a short hedge involves the sale of futures against cash ownership. With options, the short hedge alternative is the purchase of puts – the right to sell futures. Grain producers can buy put options to establish a minimum price for protection, without giving up the opportunity to profit from higher prices.

Hedging strategy	Futures	Options alternative
Long hedge	Buy futures	Buy call options
Short hedge	Sell futures	Buy put options

Option buyers may:

- Exercise the option
- Sell the option
- Let the option expire

Option sellers receive premiums but must post margin.

Option Premiums

Trading in options is based on premiums. Option buyers pay a premium for calls (the right to buy futures) and puts (the right to sell futures). Option sellers receive a premium and have obligations. The premium paid for options is negotiated by buyers and sellers. What factors help determine the premium paid for an option?

An option premium is made up of two components; **intrinsic value** and **time value**. Intrinsic value refers to whether an option is of value compared to the current futures market. Time value is the rest of the premium – the part that is not attributed to intrinsic value. Let's explore intrinsic value and time value.

A call option is in-the-money if the strike price is below the futures price (in other words, the right to buy futures has value at that time). A \$6 July corn call is in-the-money if July futures are trading higher than \$6 per bushel. For example, if July corn futures are at \$6.75 per bushel, we would say the \$6 call is 75 cents in-the-money. If July futures are at \$6 per bushel (the same as the strike price), the option is at-the-money. If July futures are trading less than \$6 per bushel, the \$6 calls are out-of-the-money. If July corn is trading at \$5.50 per bushel, we would say the \$6 call is 50 cents out-of-the-money.

A put option is in-the-money if the strike price is above the futures price (in other words, the right to sell futures has value at that time). A \$15 November soybean call is in-the-money if November futures are trading lower than \$15 per bushel. For example, if November soybeans futures are trading at \$13.80 per bushel, we would say the \$15 put is 120 cents in-the-money. If November futures are at \$15 per bushel, the put option is at-the money. If November futures are trading higher than \$15 per bushel, a \$15 put is out-of-the-money. If November soybeans are trading at \$17.50 per bushel, we would say the \$15 put is \$2.50/bu. out-of-the-money.

Time value is that part of the premium not attributed to intrinsic value. Time value is influenced by two factors; length of time to expiration and volatility of the underlying futures contract. It is the time value component of options premiums that is often compared to insurance premiums.

Consider the time to expiration and the impact on premiums. When buying auto insurance, which will cost more; 6 months of coverage, or one year? The answer is obvious. Buying coverage for a full year will cost about twice as much. The same reasoning applies to options. The more time there is to expiration, the higher the time value of the premium. Consider, for example, a cattle feeder buying call options on corn

futures to cover input costs. Which at-the-money option would you expect to have more time value in mid-January - a May or a December corn call? May calls will expire in mid-April, and provide price “coverage” for 3 months. The December option expires in mid-November, providing 10 months of coverage. Clearly, the time value on the December call will be higher than the May call.

Options are sometimes described as "wasting assets" because the time value portion of the premium erodes over time.

Further reading

Self-Study Guide to Hedging with Grain and Oilseed Futures and Options (handbook), CME Group, April 2012 <http://www.cmegroup.com/trading/agricultural/self-study-guide-to-hedging-with-grain-and-oilseed-futures-and-options.html>

Grain and Oilseed Futures and Options (brochure), CME Group, February 2012 <http://www.cmegroup.com/trading/agricultural/grain-and-oilseed-futures-and-options-fact-card.html>

Exercise #13: Understanding Intrinsic and Time Value in Options

Use the following market closes for soybean futures and options to answer the questions below.

Soybean futures

Contract	Closing Price
July futures	\$13.88
September futures	\$13.86

Soybean options (cents per bushel)

Strike	July Calls	Sept Calls	July Puts	Sept Puts
1340	86'1	116'2	38'0	70'5
1360	74'4	106'2	46'3	80'5
1380	64'4	96'7	56'3	91'1
1400	56'1	88'1	67'7	102'3
1420	48'6	80'6	80'4	114'7

Calculate the following intrinsic and time values

Intrinsic value of a 1360 July call: _____

Time value of the same call: _____

Intrinsic value of a 1380 July put: _____

Time value of the same put: _____

Intrinsic value of a 1420 September put: _____

Time value of the same put: _____

Intrinsic value of a 1400 September call: _____

Time value of the same call: _____