



Factors Affecting Option Premium Values

Curriculum Guide

I. Goals and Objectives

- A. Understand the components of option premiums.
- B. Learn how to compute the intrinsic value and time value of option premiums.
- C. Be able to evaluate option premiums currently available for alternative commodities.

II. Descriptions/Highlights

- A. The use of futures contract options (puts and calls) is one of many available marketing alternatives. As opposed to forward contracting or hedging in the futures market, the use of options provides the opportunity to benefit from favorable price fluctuations. The purchase of a put option allows the buyer to establish a price floor while still maintaining the opportunity to benefit from rising prices. The purchase of a call option allows the buyer to establish a price ceiling while still retaining the opportunity to benefit from declining prices.
- B. In contrast to taking a position in the futures market, the purchase of an option does not require the buyer to post margin money or establish a margin account. The option buyer pays the option seller a premium which gives the buyer the right, but not the obligation, to take a position in the futures market at a designated price, known as the strike price.
- C. There are a number of objectives that can be addressed with options. All involve some degree of price protection against unfavorable price fluctuations. In this regard, the premium for an option resembles an insurance premium for protection against price risk.
- D. The two specific aspects of an option contract are the underlying futures contract and the strike price of the option. Since the option gives the buyer the right to take a futures position, the contract specifications are identical to those of the related futures contract. Strike prices are listed at increments above and below the current futures contract price. The total cost of buying an option is equal to the option premium times the futures contract size plus commission.
- E. Option premiums can be broken into two parts: intrinsic value and time value. Intrinsic value is the “built-in” value of an option. Intrinsic value is the difference between the option strike price and the underlying futures price. Intrinsic value cannot be less than zero. Time value is equal to the option premium less the intrinsic value. Time value

represents the value of the remaining life of the option. This relationship can be defined as: $\text{Option Premium} = \text{Intrinsic Value} + \text{Time Value}$.

- F. An option can be classified as: “in-the-money,” “out-of-the-money,” or “at-the-money.” The difference between these classifications is based on the relationship between the option (put or call) strike price and the underlying futures price.
- G. Four factors determine an option’s value: (1) the relationship between the option strike price and the underlying futures price, (2) the length of time remaining until expiration, (3) the volatility of the underlying futures price and (4) the interest rate.
- H. An options value at expiration will reflect whatever amount of money the option holder could realize by exercising the option, i.e. the intrinsic value, if any, remaining in the option. For a call to have intrinsic value at expiration, the futures price must be above the strike price. For a put to have intrinsic value at expiration, the futures price must be below the strike price.

III. Potential Speakers

- A. Extension economists
- B. Local commodity brokers
- C. Marketing advisors

IV. Review Questions

- A. What are the two specific aspects of a futures contract option?

Answer: The underlying futures contract and the strike price

- B. What is a strike price?

Answer: A strike price is the price at which a put (call) option buyer has the right, but not the obligation to sell (buy) a futures contract. Options are available with strike prices in various price increments. These price listings are both above and below the price at which futures contracts are currently trading for each commodity.

- C. What are the two components of option premiums?

Answer: The two components of the option’s premium are intrinsic value and time value.

- D. What factor influences an option’s intrinsic value?

Answer: An option’s intrinsic value is determined by the relationship between the underlying futures price and the option strike price.

E. What are the factors that influence an option's time value?

Answer: The factors influencing an option's time value are: the length of time remaining until expiration, the volatility of the underlying futures price, the relationship between the futures price and the strike price, and interest rates.

V. For More Details

Chicago Board of Trade. Options on agricultural futures, a home study course. Board of Trade of the City of Chicago. Revision - January 1995.

Ernest E. Davis, Ed G. Smith, Thomas Sporleder, and Carl Anderson. An Introduction to Agriculture Commodity Options, Farm Management Handbook, LM-5, Texas Agricultural Extension Service, The Texas A&M University System.

Factors Affecting Options Premium Values



! The Use of Options

- ☞ Put Options
- ☞ Call Options
- ☞ Strategies for Using Options

! Option Premium Specifics

- ☞ Underlying Futures Contract
 - ✓ Trading Sites
 - ✓ Contract Sizes
 - ✓ Contract Months

- ☞ Strike Prices

Factors Affecting Options Premium Values



! Components of Option Premiums

- ☞ Intrinsic Value
 - ✓ “In-the-Money” Positions
 - ✓ “Out-of-the-Money” Positions
 - ✓ “At-the-Money” Positions
- ☞ Time Value
 - ✓ Relationship between futures price and strike price
 - ✓ Length of Time until Expiration
 - ✓ Volatility of the Futures Price
 - ✓ Interest Rates

! Option Values at Expiration

! Profitable Option Positions

- ☞ Profitable Call Options
- ☞ Profitable Put Options

! Option Pricing in Summary

Factors Affecting Options Premium Values



Determining options premiums exercise

1. Classify the following options as either “IN-THE-MONEY,” “OUT-OF-THE-MONEY,” or “AT-THE-MONEY.”
 - a. _____ A cotton put option with a strike price of \$0.73/lb. when the underlying cotton futures contract is trading at \$0.75/lb.
 - b. _____ A soybean call option with a strike price of \$6.75/bu. when the underlying soybean futures contract is trading at \$7.00/bu.
 - c. _____ A corn call option with a strike price of \$2.40/bu. when the underlying corn futures contract is trading at \$2.40/bu.
 - d. _____ A corn put option with a strike price of \$2.70/bu. when the underlying corn futures contract is trading at \$2.43/bu.

2. Suppose a soybean put option with a \$6.50 strike price commands a premium of \$0.24 per bushel and the underlying soybean futures contract is trading at \$6.45.
 - a. What is the intrinsic value of the soybean option? _____
 - b. What is the time value? _____
 - c. What would be the total cost of the option (\$/contract) excluding commission? _____

Factors Affecting Options Premium Values



3. Suppose you want to establish a minimum price (or floor price) for your cotton crop when cotton futures contracts are trading at 72.90 cents. Given the strike prices and premiums below and an expected harvest basis 4 cents under the December cotton contract, what is the minimum floor price you can expect? **Useful Information:** Expected Price Floor = Put Strike Price - Put Option Premium +/- Expected Basis. A cotton futures contract is 50,000 lbs.

Strike Price (Cents/lb.)	Put Option Premium (Cents/lb.)	Expected Basis (Cents/lb.)	Expected Floor Price (Cents/lb.)	Total Cost of the Put Option (excluding Commission) (Dollars/contract)
71.0	2.09	- 4.0		
72.0	2.32	-4.0		
73.0	2.85	-4.0		
74.0	3.32	-4.0		
75.0	3.87	-4.0		
76.0	4.48	-4.0		

Answers for determining options premiums exercise

1. Classify the following option positions as either “IN-THE-MONEY,” “OUT-OF-THE-MONEY,” or “AT-THE-MONEY.”
 - a. **“OUT-OF-THE-MONEY”** - A cotton put option with a strike price of \$0.73/lb. when the underlying cotton futures contract is trading at \$0.75/lb.
 - b. **“IN-THE-MONEY”** - A soybean call option with a strike price of \$6.75/bu. when the underlying soybean futures contract is trading at \$7.00/bu.
 - c. **“AT-THE-MONEY”** - A corn call option with a strike price of \$2.40/bu. when the underlying corn futures contract is trading at \$2.40/bu.
 - d. **“IN-THE-MONEY”** - A corn put option with a strike price of \$2.70/bu. when the underlying corn futures contract is trading at \$2.43/bu.

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2. Suppose a soybean put option with a \$6.50 strike price commands a premium of \$0.24 per bushel and the underlying soybean futures contract is trading at \$6.45.
- What is the intrinsic value of the soybean option? **\$0.05 per bushel**
 - What is the time value? **\$0.19 per bushel**
 - What would be the total cost of the option? **\$1,200** (\$0.24 per bushel X 5,000 bushels)
3. Suppose you want to establish a minimum price (or floor price) for your cotton crop when cotton futures contracts are trading at 72.90 cents. Given the strike prices and premiums below and an expected basis 4 cents under the December cotton contract, what is the minimum floor price you can expect? **Useful Information:** Expected Price Floor = Put Strike Price - Put Option Premium +/- Expected Basis. A cotton futures contract is 50,000 lbs.

Strike Price (Cents/lb.)	Put Option Premium (Cents/lb.)	Expected Basis (Cents/lb.)	Expected Floor Price (Cents/lb.)	Total Cost of the Put Option (excluding Commission) (Dollars/contract)
71.0	2.09	- 4.0	64.91	\$1,045
72.0	2.32	-4.0	65.68	\$1,160
73.0	2.85	-4.0	66.15	\$1,425
74.0	3.32	-4.0	66.68	\$1,660
75.0	3.87	-4.0	67.13	\$1,935
76.0	4.48	-4.0	67.52	\$2,240